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X3 — COMPUTERS & INFORMATION PROCESSING**

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This DICTIONARY has been adopted for Federal Government use as a basic reference document to promote a common understanding of information processing terminology.

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# **American National Dictionary for Information Processing**

**American National Standards Committee  
X3 — Computers and Information Processing**

**Secretariat: Computer and Business Equipment Manufacturers Association**

*Published by*  
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## Foreword

The communication of facts and ideas depends upon a mutual understanding of terminology. This is particularly true in the rapidly growing field of information processing, in which there is a continuing need for a comprehensive source of technical terms and definitions.

By direction of the American National Standards Committee on Computers and Information Processing (X3) the Technical Committee on Vocabulary (X3K5) prepared this American National Dictionary for Information Processing (ANDIP). The Dictionary is based on the American National Standard Vocabulary for Information Processing, X3.12-1970, published by the American National Standards Institute. The Dictionary was developed not only by combining existing lexicons, but also by studying the use of terms throughout the field of computers and information processing. Technical Committee X3K5, in consultation with other X3 technical committees, used proposed and approved American national standards and vocabularies submitted by other bodies as the sources of terms and definitions. The Dictionary influenced the development of sections of the International Organization for Standardization Vocabulary of Data Processing, prepared by ISO Technical Committee 97, Subcommittee 1 (ISO/TC 97/SC 1), and includes terms and definitions from that vocabulary.

Advances in the field of information processing cause changes in terminology. Suggestions for changes or additions to this document should be addressed to the Computer and Business Equipment Manufacturers association, 1828 L Street NW, Washington, DC 20036.

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## Sequence of Entries

The sequence of entries in this Dictionary is determined on a letter-by-letter basis, in other words, only the letters of the alphabet are used to determine the sequence of entries.

## Organization of an Entry

An entry consists of a term or the abbreviation or acronym for a term followed by a commentary. When a commentary includes several different definitions for that term, each definition is a separate item. When an item is used to refer to all the terms having the same last word, it lists all of these terms in natural order and precedes this list with the word "See".

**Selection of Terms**

A term is a word or group of words to be defined. In this Dictionary, the singular form of the noun and the infinitive form of the verb are the terms most often selected to be defined. If the term can be abbreviated, the abbreviation is given in parentheses immediately following the term.

**Organization of a Commentary**

A commentary consists of one or more items (definitions or references) arranged in the following order:

**Noun Form****General Definitions**

- (1) International Definition
- (2) USA Definition
- (3) References

**Specific Definitions (for special disciplines)**

- (4) International Definition
- (5) USA Definition
- (6) References

**Verb Form (if applicable)****General Definitions**

- (7) International Definition
- (8) USA Definition
- (9) References

**Specific Definitions (for special disciplines)**

- (10) International Definition
- (11) USA Definition
- (12) References

**Adjective Form (if applicable)****General Definitions**

- (13) International Definition
- (14) USA Definition
- (15) References

**Specific Definitions (for special**

disciplines)

- (16) International Definitions
- (17) USA Definition
- (18) References

Each item may include an item number, a source label, a usage label, a descriptive phrase, an annotation, and a reference to other terms, in that order.

**Item Number**

Each item in a commentary is numbered consecutively starting with item (1). If the commentary consists of only one item, the item number is omitted.

**Source Label**

This label precedes the definition and identifies the source of the definition. Definitions bearing the source label (ISO) are based on material developed by the International Organization for Standardization. All other definitions are based on sundry authoritative sources.

**Usage Label**

This label is a word or phrase that indicates the area or manner of usage of the item. For example, the label "In programming" indicates an area of usage, and the label "Loosely," indicates a manner of usage. The usage label is followed by a comma.

**Descriptive Phrase**

This states, or provides an initial statement of, the definition of the term and may be assumed to be preceded by the phrase, "(the term) is defined as." The descriptive phrase completes the initial sentence. The part of speech of the term being defined is indicated by the introductory words in the descriptive phrase, where the word "to" indicates a verb,

"pertaining to" indicates a modifier, and other words indicate a noun.

#### **Annotation**

This part of the definition consists of any number of complete sentences. These sentences follow the descriptive phrase and provide additional descriptive or explanatory information.

#### **References**

A reference consists of a symbol or phrase to direct the user to another item in the same commentary or to another entry or item in the Dictionary. If the term being defined is an acronym or abbreviation, the complete unabbreviated term is given and the term is defined in a separate entry (except where the abbreviation or acronym is predominantly used; e.g., FORTRAN.) An italicized term occurring in a commentary indicates that the term, or a grammatically different form of it, has been defined elsewhere in the Dictionary. Also, the reference symbols (Deprecated term for, Synonymous with, Synonym for, Contrast with, See, and See also) explain the nature of the reference

as described below. The reference symbols are described in the order in which they would occur within an entry:

**Deprecated term for.** Indicates that the term should not be used (because it is obsolete, misleading, ambiguous, or jargon) and refers to the preferred term.

**Synonymous with.** Identifies terms that have the same meaning as the defined term, and which refer to the defined term with a "Synonym for" reference symbol.

**Synonym for.** Refers to a defined term that has the same meaning.

**Contrast with.** Refers to a term that has an opposite or substantively different meaning.

**See.** Refers to multiple-word terms that have the same last word or words.

**See also.** Refers to related terms that have a similar, but not synonymous, meaning.

## A

**absolute address**

- (1) (ISO) An *address* in a *computer language* that identifies a *storage location* or a device without the use of any intermediate reference.
- (2) An *address* that is permanently assigned by the machine designer to a *storage location*.
- (3) Synonymous with explicit address, machine address, specific address.

**absolute addressing**

(ISO) A method of *addressing* in which the *address part* of an *instruction* contains an *absolute address*.

**absolute coding**

Coding that uses *computer instructions* with *absolute addresses*. Synonymous with specific coding.

**absolute error**

- (1) (ISO) The algebraic result of subtracting a true, specified, or theoretically correct value from the value computed, observed, measured, or achieved.
- (2) The amount of *error* expressed in the same *units* as the quantity containing the error.
- (3) Loosely, the absolute value of the error, i.e., the magnitude of the error without regard to its algebraic sign.

**absolute instruction**

(ISO) A *computer instruction* in its final, *executable* form.

**absolute loader**

A *routine* that *reads* a *computer program* into *main storage*, beginning at the *assembled origin*.

**abstract symbol**

- (1) (ISO) A *symbol* whose meaning and use have not been determined by a general agreement but have to be defined for each application of the symbol.
- (2) In *optical character recognition*, a *symbol* whose form does not suggest its meaning and use; these should be defined for each specific set of applications.

**access**

See *direct access*, *direct access storage*, *immediate access storage*, *random access*, *remote access*, *serial access*.

**access arm**

A part of a *disk storage* unit that is used to hold one or more *reading* and *writing heads*.

**access mode**

A technique that is used to obtain a specific *logical record* from, or to place a specific logical record into, a *file* assigned to a *mass storage device*.

**access time**

- (1) (ISO) The time interval between the instant at which an *instruction control unit* initiates a call for *data* and the instant at which delivery of the data is completed. Access time equals *latency* plus *transfer time*.
- (2) The time interval between the instant at which *data* are requested to be *stored* and the instant at which *storage* is started.
- (3) (ISO) Deprecated term for *cycle time*.

**accounting machine**

- (1) A keyboard-actuated machine that prepares accounting *records*.
- (2) A machine that *reads data* from external *storage media*, such as cards or

tapes, and automatically produces accounting records or tabulations, usually on continuous forms.

- (3) See *electrical accounting machines*.

**accumulator**

(ISO) A *register* in which the *result* of an *operation* is formed.

**accuracy**

- (1) (ISO) A quality held by that which is free of *error*.
- (2) (ISO) A qualitative assessment of freedom from *error*, a high assessment corresponding to a small error.
- (3) (ISO) A quantitative measure of the magnitude of *error*, preferably expressed as a *function* of the *relative error*, a high value of this measure corresponding to a small error.
- (4) Contrast with *precision*.

**accuracy control character**

A *control character* used to indicate whether the *data* with which it is associated are in *error* or are to be disregarded, or cannot be represented on a particular device. Synonymous with *error control character*.

**ACK**

The *acknowledge character*.

**acknowledge character (ACK)**

- (1) (ISO) A *transmission control character* transmitted by a station as an affirmative response to the station with which the connection has been set up.
- (2) A *transmission control character* transmitted by a receiver as an affirmative response to a sender. An acknowledge character may also be used as an *accuracy control character*.
- (3) See *negative acknowledge character*.

**acoustic delay line**

A *delay line* whose *operation* is based on time of propagation of sound waves in a given medium. Synonymous with *sonic delay line*.

**acoustic memory**

Deprecated term for *acoustic storage*.

**acoustic storage**

A *storage device* consisting of *acoustic delay lines*.

**actual instruction**

(ISO) Deprecated term for *effective instruction*.

**actual key**

In *COBOL*, a *key* that directly expresses the physical *location* of a *logical record* on a *mass storage* medium.

**add**

See *false add*.

**addend**

(ISO) In an addition *operation*, a *number* or quantity added to the *augend*.

**adder**

- (1) (ISO) A device whose *output data* are a representation of the *sum* of the *numbers* represented by its *input data*.
- (2) A device whose *output* is a representation of the sum of the quantities represented by its *inputs*.
- (3) See *full adder*, *half adder*, *parallel adder*, *serial adder*.

**adder subtracter**

(ISO) A device that acts as an *adder* or *subtracter* depending upon the control *signal* received. The adder subtracter may be constructed so as to yield the *sum* and the *difference* at the same time.



**addition**

See *parallel addition*, *serial addition*.

**addition without carry**

(ISO) Deprecated term for *non-equivalence operation*.

**address**

- (1) (ISO) A *character* or group of characters that identifies a *register*, a particular part of *storage*, or some other *data* source or destination.
- (2) (ISO) To refer to a device or an *item* of *data* by its *address*.
- (3) See *absolute address*, *base address*, *direct address*, *effective address*, *four address*, *four-plus-one address*, *generated address*, *immediate address*, *indexed address*, *indirect address*, *instruction address*, *machine address*, *multiaddress*, *multilevel address*, *n-level address*, *one-level address*, *real address*, *relative address*, *relocatable address*, *self-relative address*, *single-address*, *specific address*, *symbolic address*, *synthetic address*, *two-level address*, *virtual address*, *zero-level address*.

**addressability**

In *micrographics*, the number of addressable positions, within a specified *film frame*, as follows: number of *addressable horizontal positions* by number of *addressable vertical positions*, e.g., 4000 by 4000.

**addressable horizontal positions**

- (1) In *micrographics*, the number of positions, within a specified *film frame*, at which a vertical line can be placed.
- (2) In *computer graphics*, the number of positions, within a specified raster, at which a full length vertical line can be placed.

**addressable vertical positions**

- (1) In *micrographics*, the number of positions, within a specified *film frame*, at which a horizontal line can be placed.
- (2) In *computer graphics*, the number of positions, within a specified raster, at which a full length horizontal line can be placed.

**address format**

- (1) The arrangement of the *address parts* of an *instruction*. The expression *plus-one* is frequently used to indicate that one of the addresses specifies the location of the next instruction to be executed, such as *one-plus-one*, *two-plus-one*, *three-plus-one*, *four-plus-one*.
- (2) The arrangement of the parts of a *single address*, such as those required for identifying *channel*, *module*, *track*, etc. in a *magnetic disk* system.

**addressing**

See *absolute addressing*, *deferred addressing*, *direct addressing*, *immediate addressing*, *implied addressing*, *indirect addressing*, *one-ahead addressing*, *relative addressing*, *repetitive addressing*, *self-relative addressing*, *symbolic addressing*.

**address modification**

Any arithmetic, logic or syntactic *operation* performed on an *address*.

**address part**

(ISO) A part of an *instruction* that usually contains only an *address* or part of an *address*.

**address register**

- (1) A *register* in which an *address* is stored.
- (2) See *base address register*, *instruction address register*.

**address track**

(ISO) A *track* that contains *addresses*.

**adjacency**

In *character recognition*, a condition in which the *character spacing reference lines* of two consecutively printed *characters* printed on the same line are separated by less than a specified distance.

**administrative data processing**

(ISO) *Automatic data processing* used in accounting or in management. Synonymous with business data processing.

**ADP**

*Automatic data processing*.

**algebraic language**

An *algorithmic language* many of whose *statements* are structured to resemble the structure of algebraic expressions, e.g., *ALGOL*, *FORTRAN*.

**algebraic manipulation**

The *processing* of mathematical *expressions* without concern for the *numeric values* of the *symbols* that represent *numbers*.

**ALGOL(Algorithmic language)**

A *language* used to express *computer programs* by *algorithms*.

**algorithm**

(ISO) A finite *set* of well-defined rules for the solution of a problem in a finite number of steps, e.g., a full statement of an arithmetic *procedure* for evaluating  $\sin x$  to a stated *precision*.

**algorithmic language**

(ISO) An *artificial language* established for expressing *algorithms*.

**alias**

An alternate *label*. For example, a label and one or more aliases may be used to refer to the same *data element* or point in a *computer program*.

**allocation**

See *dynamic storage allocation*, *storage allocation*.

**alphabet**

(1) (ISO) An *ordered set* of all the *letters* used in a *language*, including letters with diacritical signs where appropriate, but not including punctuation marks.

(2) An *ordered set* of *symbols* used in a *language*, e.g., the Morse code alphabet, the 128 *ASCII characters*.

**alphabetic character set**

(ISO) A *character set* that contains *letters* and may contain *control characters*, *special characters*, and the *space character*, but not *digits*.

**alphabetic character subset**

(ISO) A *character subset* that contains *letters* and may contain *control characters*, *special characters*, and the *space character*, but not *digits*.

**alphabetic code**

(ISO) A *code* according to which *data* is represented using an *alphabetic character set*.

**alphabetic coded character set**

(ISO) A *coded character set* whose *character set* is an *alphabetic character set*.

**alphabetic string**

(1) (ISO) A *string* consisting solely of *letters* from the same *alphabet*.

(2) A *character string* consisting solely of

letters and associated *special characters* from the same *alphabet*.

#### **alphabetic word**

- (1) (ISO) A *word* consisting solely of *letters* from the same *alphabet*.
- (2) A *word* consisting of *letters* and associated *special characters*, but not *digits*.

#### **alphameric**

Synonym for *alphanumeric*.

#### **alphanumeric**

Pertaining to a *character set* that contains *letters*, *digits*, and usually other *characters* such as punctuation marks. Synonymous with *alphameric*.

#### **alphanumeric character set**

(ISO) A *character set* that contains both *letters* and *digits* and may contain *control characters*, *special characters*, and the *space character*.

#### **alphanumeric character subset**

(ISO) A *character subset* that contains both *letters* and *digits* and may contain *control characters*, *special characters*, and the *space character*.

#### **alphanumeric code**

(ISO) A *code* according to which *data* is represented using an *alphanumeric character set*.

#### **alphanumeric coded character set**

(ISO) A *coded character set* whose *character set* is an *alphanumeric character set*.

#### **alphanumeric data**

(ISO) *Data* represented by *letters* and *digits*, perhaps with *special characters* and the *space character*.

#### **analog**

- (1) (ISO) Pertaining to representation by means of continuously variable physical quantities.
- (2) Contrast with *digital*, *discrete*.
- (3) See *network analog*.

#### **analog computer**

- (1) (ISO) A *computer* in which *analog* representation of *data* is mainly used.
- (2) A *computer* that operates on *analog data* by performing physical processes on these data.
- (3) Contrast with *digital computer*.

#### **analog data**

(ISO) *Data* represented by a physical quantity that is considered to be continuously variable and whose magnitude is made directly proportional to the data or to a suitable *function* of the data.

#### **analog representation**

(ISO) A representation of the value of a *variable* by a physical quantity that is considered to be continuously variable, the magnitude of the physical quantity being made directly proportional to the variable or to a suitable *function* of the variable.

#### **analysis**

- (1) The methodical investigation of a problem, and the separation of the problem into smaller related *units* for further detailed study.
- (2) See *flow analysis*, *numerical analysis*.

#### **analyst**

(ISO) A person who defines problems and develops *algorithms* and *procedures* for their solution.

#### **analyzer**

See *differential analyzer*, *digital differential analyzer*, *network analyzer*.

**AND**

(ISO) A logic operator having the property that if P is a statement, Q is a statement, R is a statement..., then the AND of P,Q,R... is true if all statements are true, false if any statement is false.  $P \text{ AND } Q$  is often represented by  $P \cdot Q$ ,  $PQ$ ,  $P \wedge Q$ . Synonymous with logical multiply.

**AND element**

- (1) (ISO) A logic element that performs the boolean operation of conjunction.
- (2) Synonym for *AND gate*.

**AND gate**

- (1) A gate that implements the logic AND operator.
- (2) Synonym for *AND element*.

**AND-not operation**

(ISO) Deprecated term for *exclusion*.

**AND operation**

(ISO) Synonym for *conjunction*.

**annotation**

An added descriptive comment or explanatory note.

**anticipatory buffering**

A technique by which data are stored in a buffer before they are needed.

**aperture**

- (1) (ISO) One or more adjacent characters in a mask that cause retention of the corresponding characters.
- (2) An opening in a data medium or device such as a card or magnetic core; e.g., the aperture in an aperture card combining a microfilm with a punched card, or in a multiple aperture core.
- (3) A part of a mask that permits retention of the corresponding portions of data.
- (4) See *multiple aperture core*.

**aperture card**

A processable card of standard dimensions into which microfilm frames can be inserted.

**aperture core**

See *multiple aperture core*.

**application-oriented language**

A problem-oriented language whose statements contain or resemble the terminology of the occupation or profession of the user, e.g., a report program generator.

**arbitrary sequence computer**

(ISO) A computer in which each instruction explicitly determines the location of the next instruction to be executed.

**architecture**

See *computer architecture*.

**argument**

- (1) (ISO) An independent variable.
- (2) (ISO) Any value of an independent variable.

**arithmetical instruction**

(ISO) Synonym for *arithmetic instruction*.

**arithmetic and logic unit**

(ISO) A part of a computer that performs arithmetic operations, logic operations, and related operations.

**arithmetic check**

Synonym for *mathematical check*.

**arithmetic instruction**

(ISO) An instruction in which the operation part specifies an arithmetic operation. Synonymous with *arithmetical instruction*.

**arithmetic operation**

- (1) (ISO) An operation that follows the rules of arithmetic.

- (2) See *binary arithmetic operation*.

**arithmetic overflow**

- (1) (ISO) That portion of a *numeric word* expressing the *result* of an *arithmetic operation* by which its *word length* exceeds the word length provided for the *number representation*.  
Synonymous with overflow.
- (2) (ISO) That portion of a *word expressing the result* of an *operation* by which its *word length* exceeds the *storage capacity* of the intended *storage device*.

**arithmetic register**

(ISO) A *register* that holds the *operands* or the *results* of operations such as *arithmetic operations*, *logic operations*, and *shifts*.

**arithmetic shift**

(ISO) A *shift*, applied to the representation of a *number* in a *fixed-radix numeration system* and in a *fixed-point representation system*, in which only the *characters* representing the absolute value of the number are *moved*. An arithmetic shift is usually equivalent to multiplying the number by a positive or a negative integral power of the *radix* except for the effect of any *rounding*.

**arithmetic underflow**

(ISO) In an *arithmetic operation*, a *result* whose absolute value is too small to be represented within the *range* of the *numeration system* in use. For example, the condition existing, particularly when a *floating-point representation system* is used, when the result is smaller than the non-zero quantity that can be represented; the result may underflow because of the generation of a negative *exponent* that is outside the permissible range.

**arithmetic unit**

(ISO) A part of a *computer* that performs *arithmetic operations*, and related *operations*.

**array**

An arrangement of *elements* in one or more dimensions.

**array pitch**

Synonym for *row pitch*.

**artificial intelligence**

- (1) The capability of a device to perform *functions* that are normally associated with human intelligence, such as reasoning, learning, and self-improvement.
- (2) See also *machine learning*.

**artificial language**

- (1) (ISO) A *language* whose rules are explicitly established prior to its use.
- (2) Contrast with *natural language*.

**ASCII (American National Standard Code for Information Interchange)**

The standard code, using a *coded character set* consisting of 7-bit coded characters (8-bits including *parity check*), used for *information interchange* among *data processing system*, *data communication systems*, and associated equipment. The ASCII set consists of *control characters* and *graphic characters*.

**assemble**

- (1) (ISO) To *translate a program* expressed in an *assembly language* into a *computer language* and perhaps to *link subroutines*. Assembling is usually accomplished by substituting the computer language *operation code* for the assembly language operation code and by substituting *absolute addresses*, *immediate addresses*, *relocatable ad-*



*dresses, or virtual addresses for symbolic addresses.*

- (2) To prepare a *machine language program* from a *symbolic language program* by substituting absolute *operation codes* for symbolic operation codes and *absolute* or relocatable *addresses* for *symbolic addresses*.

#### **assemble-and-go**

An operating technique in which there are no stops between the *assembling, loading, and execution* of a *computer program*.

#### **assembled origin**

The *address* of the initial *storage location* assigned to a *computer program* by an *assembler, a compiler, or a linkage editor*.

#### **assemble duration**

(ISO) Synonym for *assembling time*.

#### **assembler**

(ISO) A *computer program* used to *assemble*. Synonymous with *assembly program*.

#### **assembling phase**

(ISO) Synonym for *assembly phase*.

#### **assembling time**

(ISO) The elapsed time taken for the *execution* of an *assembler*. Synonymous with *assemble duration*.

#### **assembly language**

- (1) (ISO) A *computer-oriented language* whose *instructions* are usually in one-to-one correspondence with *computer instructions* and that may provide facilities such as the use of *macro-instructions*.
- (2) A *computer programming language* whose *statements* may be *instructions* or *declarations*. The instructions usually have a one-to-one correspondence

with *machine instructions*. Synonymous with *computer-dependent language, computer-oriented language*.

#### **assembly phase**

(ISO) Of a *run*, the logical subdivision that includes the *execution* of the *assembler*. Synonymous with *assembling phase*.

#### **assembly program**

(ISO) Synonym for *assembler*.

#### **assignment statement**

- (1) An *instruction* used to express a *sequence of operations*, or used to assign *operands* to specified *variables, or symbols, or both*.
- (2) In *COBOL*, a *statement* used to associate a file with the symbolic name of a device.

#### **associative storage**

- (1) (ISO) A *storage device* whose *storage locations* are identified by their contents, or by part of their contents, rather than by their names or *positions*. Synonymous with *content-addressed storage*.
- (2) Contrast with *parallel search storage*.

#### **asynchronous computer**

- (1) (ISO) A *computer* in which each event or the performance of each *operation* starts as a result of a *signal* generated by the completion of the previous event or operation, or on the availability of the parts of the computer required for the next event or operation.
- (2) Contrast with *synchronous computer*.

#### **asynchronous operation**

- (1) (ISO) An operation that occurs without a regular or predictable time relationship to a specified event, e.g., the *calling* of an *error diagnostic routine*

that may receive control at any time during the *execution* of a *computer program*.

- (2) A *sequence of operations* in which operations are *executed* out of time coincidence with any *event*.
- (3) Synonymous with *asynchronous working*.

**asynchronous working**

(ISO) Synonym for *asynchronous operation*.

**attribute**

See *data attribute*.

**augend**

(ISO) In an *addition operation*, a *number* or *quantity* to which numbers or quantities are added.

**automated data medium**

Synonym for *machine readable medium*.

**automatic**

(ISO) Pertaining to a *process* or *device* that, under specified conditions, *functions* without intervention by a human *operator*.

**automatic carriage**

A control mechanism for a typewriter or other *listing* device that can automatically control the feeding, spacing, skipping, and ejecting of paper or preprinted forms.

**automatic check**

- (1) A *check* performed by equipment built-in specifically for checking purposes. Synonymous with built-in check, hardware check.
- (2) Contrast with *programmed check*.

**automatic coding**

Synonym for *automatic programming*.

**automatic control engineering**

(ISO) That branch of science and technology which deals with the design and use of *automatic control devices* and *systems*.

**automatic data processing (ADP)**

- (1) (ISO) *Data processing* largely performed by *automatic* means.
- (2) (ISO) The branch of science and technology concerned with methods and techniques relating to *data processing* largely performed by *automatic* means.
- (3) Pertaining to *data processing equipment* such as *electrical accounting machines* and *electronic data processing equipment*.

**automatic-feed punch**

A punch that automatically moves *punch cards* from a *card hopper*, along a *card path* and to a *card stacker*.

**automatic programming**

The process of using a *computer* to perform some stages of the work involved in preparing a *computer program*. Synonymous with *automatic coding*.

**automatic punch**

Synonym for *card punch*.

**automation**

- (1) (ISO) The implementation of *processes* by *automatic* means.
- (2) (ISO) The conversion of a *procedure*, a *process*, or equipment to *automatic* operation.
- (3) The theory, art, or technique of making a *process* more *automatic*.
- (4) The investigation, design, development, and application of methods of rendering processes *automatic*, self-moving, or self-controlling.

**auxiliary operation**

An *offline operation* performed by equipment not under control of the *central processing unit*.

**auxiliary storage**

- (1) (ISO) A *storage device* that is not *main storage*.
- (2) *Storage* that supplements another storage.
- (3) Contrast with *main storage*.

**available time**

- (1) (ISO) The time during which a *functional unit* can be used.
- (2) Synonymous with *uptime*.
- (3) Contrast with *maintenance time*.

**average conditional information content**

(ISO) Synonym for *conditional entropy*.

**average information content**

(ISO) Synonym for *entropy*.

**average information rate**

(ISO) In *information theory*, the *mean entropy per character per time unit*; in mathematical notation, this  $H^*$  equals the mean entropy per character  $H'$  divided by the mathematical expectation  $T$  of the duration  $T_i$  of any one character  $x_i$  from the character set  $x_1, \dots, x_n$ :

$$H^* = \frac{H'}{T} \text{ where } T = \sum_{i=1}^n \tau_i p(x_i)$$

The average information rate may be expressed in a unit such as *Shannon per second*.

**average transinformation content**

(ISO) Synonym for *mean transinformation content*.

**average transinformation rate**

The *mean transinformation content per character per time unit*; in mathematical notation this  $T^*$  equals the mean transinformation content per character  $T'$  divided by the mathematical expectation,  $T$  of the duration  $T_{ij}$  of any one pair of characters  $x_i, y_j$  from sets  $x_1, \dots, x_n$  and  $y_1, \dots, y_m$ :

$$T^* = \frac{T'}{T} \text{ where } T = \sum_{i=1}^n \sum_{j=1}^m \tau_{ij} p(x_i, y_j)$$

The average transinformation rate per time may be expressed in a unit such as *Shannon per second*.

## B

**background processing**

- (1) The *execution* of lower priority *computer programs* when higher priority programs are not using the *system resources*.
- (2) Contrast with *foreground processing*.

**backspace**

- (1) To move back the *reading* or *display position* according to a prescribed format.
- (2) Contrast with *space*(4).

**backspace character (BS)**

(ISO) A *format effector* that causes the print or *display position* to move one position backward along the line without producing the printing or display of any *graphic*.

**Backus Naur form (BNF)**

A *metalanguage* used to specify or describe the *syntax* of a *language* in which each *symbol*, by itself, represents a *set* of *strings* of symbols. Synonymous with Backus normal form.

**Backus normal form (BNF)**

Synonym for *Backus Naur form*.

**balanced error**

(ISO) A *set* of *errors* the distribution of which has the mean value *zero*.

**balanced merge**

An *external sort* that places *strings* created by an *internal sort* phase on half of the available *storage devices* and then *merges* strings by moving them back and forth between an equal number of devices until the merging *process* is complete.

**balanced merge sort**

- (1) A *merge sort*, which is an *external sort*, such that the sorted *subsets* created by the *internal sorts* are equally distributed among half of the available *auxiliary storage devices*. The subsets are merged onto the other half of the auxiliary storage devices and the *process* is repeated until all items are in one sorted set.
- (2) Contrast with *unbalanced merge sort*.

**band**

- (1) (ISO) A group of *tracks* on a *magnetic drum* or on one side of a *magnetic disk*.
- (2) In *data communication*, the frequency spectrum between two defined limits.

**bank**

See *data bank*.

**bar**

See *type bar*.

**bar printer**

An *impact printer* in which the type slugs are carried on a *type bar*.

**base**

- (1) (ISO) In the *numeration system* commonly used in scientific papers, the *number* that is raised to the power denoted by the *exponent* and then multiplied by the *mantissa* to determine the *real number* represented, e.g., the number 6.25 in the expression  $2.7 \times 6.25^{1.5} = 42.1875$ .
- (2) A reference value.
- (3) A *number* that is multiplied by itself as many times as indicated by an *exponent*.
- (4) Contrast with *radix*.
- (5) See *complement base*, *data base*, *floating-point base*.

**base address**

- (1) (ISO) A *numeric* value that is used as a reference in the calculation of *addresses* in the *execution* of a *computer program*.
- (2) A given *address* from which an *absolute address* is derived by combination with a *relative address*.

**base address register**

(ISO) A *register* that holds the *base address*. Synonym for *base register*.

**base register**

Synonym for *base address register*.

**batch processing**

- (1) The *processing* of *data* or the accomplishment of *jobs* accumulated in advance in such a manner that each accumulation thus formed is processed or accomplished in the same *run*.
- (2) The *processing* of *data* accumulated over a period of time.
- (3) Loosely, the *execution* of *computer programs* *serially*.
- (4) Pertaining to the technique of *executing* a *set* of *computer programs* such that each is completed before the next program of the set is started.
- (5) Pertaining to the *sequential input* of *computer programs* or *data*.
- (6) See *remote batch processing*, *sequential batch processing*.

**baud**

- (1) A *unit* of *signalling* speed equal to the number of *discrete* conditions or signal events per second. For example, one baud equals one-half dot cycle per second in Morse code, one bit per second in a train of *binary* signals, and one 3-bit value per second in a train of signals each of which can assume one of eight different states.

- (2) In asynchronous *transmission*, the *unit* of modulation rate corresponding to one unit interval per second, i.e., if the duration of the unit interval is 20 milliseconds, the modulation rate is 50 baud.

**BCD**

*Binary-coded decimal notation*.

**beginning-of-tape marker**

- (1) (ISO) A marker on a *magnetic tape* used to indicate the beginning of the permissible recording area, e.g., a photo reflective strip, a transparent section of tape.
- (2) Contrast with *end-of-tape marker*.

**BEL**

The *bell character*.

**bell character (BEL)**

(ISO) A *control character* that is used when there is a need to call for human attention and that may activate alarm or other attention devices.

**benchmark problem**

- (1) A problem used to evaluate the performance of *hardware* or *software* or both.
- (2) A problem used to evaluate the performance of several *computers* relative to each other, or a single computer relative to *system* specifications.

**bias**

- (1) (ISO) A systematic deviation of a value from a reference value.
- (2) The amount by which the average of a *set* of values departs from a reference value.
- (3) See *ordering bias*.

**bias error**

(ISO) An *error* due to *bias*.



**bidirectional flow**

(ISO) In *flowcharting*, flow that can occur over the same *flowline* in either direction.

**binary**

- (1) (ISO) Pertaining to a selection, choice, or condition that has two possible different values or states.
- (2) (ISO) Pertaining to a *fixed radix numeration system* having a *radix* of two.
- (3) See *Chinese binary*, *column binary*, *row binary*.

**binary arithmetic operation**

- (1) (ISO) An *arithmetic operation* in which the *operands* and the *result* are represented in the *pure binary numeration system*.
- (2) Synonym for *dyadic operation*.

**binary boolean operation**

(ISO) Deprecated term for *dyadic boolean operation*.

**binary card**

A card containing *data* in *column binary* or *row binary* form.

**binary cell**

- (1) (ISO) A *storage cell* that can hold one *binary character*.
- (2) A *storage cell* of one *binary digit* capacity, e.g., a single-bit *register*.

**binary code**

A *code* that makes use of exactly two distinct *characters*, usually 0 and 1.

**binary-coded decimal code**

Synonym for *binary-coded decimal notation*.

**binary-coded decimal interchange code**

See *extended binary-coded decimal interchange code*.

**binary-coded decimal notation (BCD)**

(ISO) A *binary-coded notation* in which each of the *decimal digits* is represented by a *binary numeral*, e.g., in binary-coded decimal notation that uses the *weights* 8-4-2-1, the number "twenty three" is represented by 0010 0011 (compare its representation 10111 in the *pure binary numeration system*). Synonymous with binary-coded decimal code, binary-coded decimal representation, coded decimal notation.

**binary-coded decimal representation**

Synonym for *binary-coded decimal notation*.

**binary-coded notation**

(ISO) A *binary notation* in which each of the *decimal digits* is represented by a *binary numeral*.

**binary digit (BIT)**

- (1) (ISO) In *binary notation*, either of the *characters*, 0 or 1.
- (2) (ISO) Synonym for *bit*.
- (3) See *equivalent-binary-digit factor*.

**binary element**

(ISO) A constituent *element* of *data* that takes either of two values or states. The term *bit*, originally the abbreviation for the term *binary digit*, is misused in the sense of *binary element* or in the sense of *Shannon*.

**binary element string**

(ISO) A *string* consisting solely of *binary elements*.

**binary notation**

- (1) (ISO) Any *notation* that uses two different *characters*, usually the *binary digits* 0 and 1, e.g., the *gray code*. The *gray code* is a *binary notation*

but not a *pure binary numeration system*.

- (2) *Fixed-radix notation* where the *radix* is two. For example, in *binary notation* the numeral 110.01 represents the number  $1 \times 2$  squared plus  $1 \times 2$  to the first power plus  $1 \times 2$  to the minus 2 power, that is, six and a quarter.

#### **binary number**

Loosely, a *binary numeral*.

#### **binary numeral**

- (1) (ISO) A *numeral* in the *pure binary numeration system*, e.g., the binary numeral 101 is equivalent to the Roman numeral V.
- (2) A *binary* representation of a *number*, e.g., 101 is a binary numeral and a V is the equivalent Roman numeral.

#### **binary numeration system**

(ISO) Synonym for *pure binary numeration system*.

#### **binary operation**

(ISO) Deprecated term for *binary arithmetic operation*, *boolean operation*.

#### **binary operator**

Synonym for *dyadic operator*.

#### **binary search**

(ISO) A *dichotomizing search* in which, at each step of the *search*, the set of items is partitioned into two equal parts, some appropriate action being taken in the case of an odd number of *items*.

#### **binary symmetric channel**

(ISO) A *channel* designed to convey *messages* consisting of *binary characters* and that has the property that the conditional probabilities of changing any one character to the other character are equal.

#### **bind**

(ISO) To assign a value to a *variable*; in particular, to assign a value to a *parameter*.

#### **binder-hole card**

A card that contains one or more holes for binding.

#### **bionics**

A branch of technology relating the *functions*, characteristics, and phenomena of living systems to the development of *mechanical* systems.

#### **biquinary code**

(ISO) A *notation* in which a *decimal digit*  $n$  is represented by a pair of numerals,  $a$  being 0 or 1,  $b$  being 0, 1, 2, 3, or 4, and  $5a + b$  being equal to  $n$ . The two digits are often represented by a series of two *binary numerals*.

#### **bistable**

Pertaining to a device capable of assuming either one of two stable states.

#### **bistable circuit**

- (1) (ISO) A *trigger circuit* that has two *stable states*. Synonymous with *bistable trigger circuit*.
- (2) Synonym for *flip-flop*.

#### **bistable trigger circuit**

Synonym for *bistable circuit*.

#### **bit**

- (1) (ISO) In the *pure binary numeration system*, either of the *digits* 0 and 1. Synonymous with *binary digit*.
- (2) (ISO) Deprecated term for *binary element*, *Shannon*.
- (3) See *check bit*, *information bits*, *parity bit*, *redundancy check bit*, *sign bit*.

**bit position**

(ISO) A *character position* in a word in a binary notation.

**bit string**

(ISO) A *string* consisting solely of *bits*.

**blank**

A part of a *data medium* in which no *characters* are recorded.

**blank character**

A *graphic* representation of the *space character*.

**blip**

(ISO) Synonym for *document mark*.

**block**

- (1) (ISO) A *string* of *records*, a string of *words*, or a *character string*, formed for technical or logic reasons to be treated as an entity.
- (2) A set of things, such as *words*, *characters*, or *digits*, handled as a *unit*.
- (3) A collection of contiguous *records* recorded as a unit. Blocks are separated by *interblock gaps* and each block may contain one or more records.
- (4) A group of *bits*, or *n-ary digits*, transmitted as a unit. An *encoding procedure* is generally applied to the group of bits or *n-ary digits* for *error-control* purposes.
- (5) See *program block*.

**block cancel character**

(ISO) A *cancel character* used to indicate that the preceding portion of the *block*, back to the most recently occurring *block mark*, is to be disregarded. Synonymous with *block ignore character*.

**block character**

See *end-of-transmission-block character*.

**block diagram**

- (1) (ISO) A diagram of a *system*, *instrument*, or *computer* in which the principal parts are represented by suitably annotated geometrical figures to show both the basic *functions* of the parts and the functional relationships between them.
- (2) Contrast with *flowchart*.

**block gap**

(ISO) Synonym for *interblock gap*(1).

**block ignore character**

Synonym for *block cancel character*.

**block length**

- (1) (ISO) The number of *records*, *words*, or *characters* in a *block*.
- (2) A measure of the size of a *block*, usually specified in *units* such as *records*, *words*, *computer words*, or *characters*.

**block structure**

A hierarchy of *program blocks*.

**block transfer**

(ISO) The *process*, initiated by a single action, of *transferring* one or more *blocks* of *data*.

**blowback**

In *micrographics*, an enlargement.

**BNF**

- (1) *Backus Naur form*.
- (2) *Backus normal form*.

**boolean**

Pertaining to the *processes* used in the algebra formulated by George Boole.

**boolean add**

Synonym for *OR*.

**boolean complementation**

(ISO) Deprecated term for *negation*.

**boolean function**

(ISO) A *switching function* in which the number of possible values of the function and each of its independent variables is two.

**boolean operation**

- (1) (ISO) Any operation in which each of the operands and the result take one of two values.
- (2) (ISO) An operation that follows the rules of boolean algebra.
- (3) See *dyadic boolean operation*, *n-adic boolean operation*, *n-ary boolean operation*.

**boolean operation table**

(ISO) An operation table in which each of the operands and the result take one of two values.

**boolean operator**

- (1) (ISO) An operator each of the operands of which and the result of which take one of two values.
- (2) See *dyadic operator*, *monadic operator*.

**bootstrap**

- (1) (ISO) An existing version, perhaps a primitive version, of a computer program that is used to establish another version of the program.
- (2) A technique or device designed to bring itself into a desired state by means of its own action, e.g., a machine routine whose first few instructions are sufficient to bring the rest of itself into the computer from an input device.
- (3) That part of a computer program

used to establish another version of the computer program.

- (4) (ISO) To use a bootstrap.
- (5) See also *bootstrap loader*, *initial program loader*.

**bootstrap loader**

- (1) (ISO) An input routine in which simple preset computer operations are used to load instructions which in turn cause further instructions to be loaded until the complete computer program is in storage.
- (2) See also *bootstrap*, *initial program loader*.

**borrow**

- (1) An arithmetically negative carry.
- (2) See *end-around borrow*.

**borrow digit**

(ISO) A digit that is generated when a difference in a digit place is arithmetically negative and that is transferred for processing elsewhere. In a positional representation system, a borrow digit is transferred to the digit place with the next higher weight for processing there.

**branch**

- (1) A set of instructions that are executed between two successive branch instructions.
- (2) A direct path joining two nodes of a network or graph.
- (3) Loosely, a conditional jump.
- (4) (ISO) In the execution of a computer program, to select one from a number of alternative sets of instructions.
- (5) To select a branch as in (1).
- (6) (ISO) Deprecated term for *jump*.

**branch instruction**

- (1) (ISO) An instruction that controls branching. Synonymous with decision instruction.

- (2) (ISO) Deprecated term for *jump instruction*.

### branchpoint

- (1) (ISO) A point in a *computer program* at which *branching* occurs, in particular the *address* or the *label* of an *instruction*.
- (2) A place in a *routine* where a *branch* is selected.

### breakpoint

(ISO) A place in a *computer program*, usually specified by an *instruction*, where its *execution* may be *interrupted* by external intervention or by a *monitor program*.

### breakpoint halt

(ISO) A *closed loop* consisting of a single *jump instruction* that effects a *jump* to itself, often used to achieve a *breakpoint*. Synonymous with *breakpoint instruction*, *dynamic stop*.

### breakpoint instruction

(ISO) Synonym for *breakpoint halt*.

### b-register

(ISO) Deprecated term for *index register*.

### BS

The *backspace character*.

### bubble sort

An *exchange sort* in which the sequence of examination of pairs of *items* is reversed whenever an exchange is made. Synonymous with *sifting sort*.

### buffer

- (1) A *routine* or *storage* used to compensate for a difference in rate of flow of *data*, or time of occurrence of events, when *transferring* data from one device to another.
- (2) An isolating circuit used to prevent a

driven circuit from influencing the driving circuit.

- (3) To allocate and schedule the use of *buffers*.

### buffering

See *anticipatory buffering*.

### buffer storage

(ISO) A *storage device* that is used to compensate for differences in the rate of flow of data between components or, of an automatic *data processing system*, for the time of occurrence of events in the components.

### bug

A *mistake* or *malfunction*.

### built-in check

Synonym for *automatic check*.

### bulk storage

(ISO) Synonym for *mass storage*.

### burst

- (1) In *data communication*, a sequence of *signals* counted as one *unit* in accordance with some specific criterion or measure.
- (2) To separate continuous-form paper into discrete sheets.
- (3) See *error burst*.

### bus

One or more conductors used for *transmitting signals* or power.

### business data processing

- (1) *Data processing* for business purposes, e.g., recording and summarizing the financial transactions of a business.
- (2) (ISO) Synonym for *administrative data processing*.



**byte**

(1) (ISO) A *binary character string* operated upon as a *unit* and usually shorter than a *computer word*.

(2) See *n-bit byte*.

## C

**calculating punch**

(ISO) A *calculator* with a *card reader* and a *card punch* that *reads* the *data* on a *punched card*, performs some *arithmetic operations* or *logic operations* on the *data*, and punches the results on the same or another punched card. Synonymous with multiplying punch.

**calculator**

- (1) (ISO) A *data processor*, especially suitable for performing *arithmetical operations*, that requires frequent intervention by a human *operator*.
- (2) A device for carrying out logic and arithmetical *digital operations* of any kind.

**calculus of variations**

The theory of maxima and minima of definite integrals whose integrand is a function of the dependent variables, the independent variables, and their derivatives.

**call**

- (1) (ISO) The action of bringing a *computer program*, a *routine*, or a *subroutine* into effect, usually by specifying the *entry conditions* and *jumping* to an *entry point*.
- (2) In *data communication*, the action performed by the calling party, or the operations necessary in making a call, or the effective use made of a connection between two stations.
- (3) (ISO) In *computer programming*, to *execute* a *call*.
- (4) To transfer control to a specified *closed subroutine*.
- (5) Synonymous with *cue*.
- (6) See *subroutine call*.

**calling sequence**

(ISO) An arrangement of *instructions* and in some cases of *data* also, that is necessary to perform a *call*.

**CAN**

The *cancel character*.

**cancel character (CAN)**

- (1) (ISO) A *control character* used by some convention to indicate that the *data* with which it is associated are in *error* or are to be disregarded. Synonymous with *ignore character*.
- (2) An *accuracy control character* used to indicate that the *data* with which it is associated are in *error* or are to be disregarded.
- (3) See *block cancel character*.

**capacitor storage**

(ISO) A *storage device* that uses the capacitive properties of certain materials.

**capacity**

See *channel capacity*, *storage capacity*.

**card**

See *aperture card*, *binary card*, *binder hole card*, *check card*, *double card*, *edge coated card*, *edge-notched card*, *edge-punched card*, *flash card*, *header card*, *Hollerith card*, *laced card*, *magnetic card*, *mark-sensing card*, *processable scored card*, *punch card*, *punched card*, *scored card*, *short card*, *source data card*, *stub card*, *trailer card*.

**card column**

- (1) (ISO) A line of *punch positions* parallel to the shorter edge of a *punch card*.
- (2) A line of *punch positions* parallel to the *Y-datum line* of a *punch card*.

**card deck**

(ISO) A group of related *punched cards*.

**card feed**

(ISO) The mechanism that moves *punch cards* from the *card hopper* to the *card track*.

**card field**

A specific combination of *punch positions*, *mark sensing positions*, or both, on a card.

**card form**

See *printed card form*.

**card hopper**

- (1) (ISO) The part of a *card-processing* device that holds the cards to be processed and makes them available to a *card feed* mechanism.
- (2) Contrast with *card stacker*.

**card image**

A one-to-one representation of the *hole patterns* of a *punched card*, e.g., a matrix in which a one represents a *punch* and a zero represents the absence of a punch.

**card jam**

(ISO) A malfunction of a *card-processing* device in which cards become jammed.

**card punch**

- (1) A device that *punches* holes in a card to represent *data*.
- (2) (ISO) Deprecated term for *keypunch*.

**card reader**

- (1) (ISO) A device that *reads* or senses the holes in a *punched card*, *transforming* the *data* from *hole patterns* to electrical *signals*.
- (2) An *input device* that senses *hole patterns* in a *punched card* and translates

them into *machine language*. Synonymous with *punched card reader*.

**card row**

- (1) (ISO) A line of *punch positions* parallel to the longer edge of a *punch card*.
- (2) A line of *punch positions* parallel to the *X-datum line* of a *punch card*.

**cards**

See *continuous-form cards*.

**card set**

Cards and forms, bound in a manner that provides multiple copies of source *data*.

**card stacker**

- (1) (ISO) The part of a *card-processing* device that receives the cards after they have been *processed*.
- (2) Contrast with *card hopper*.

**card storage**

See *magnetic card storage*.

**card track**

The part of a *card-processing* device that moves and guides the card through the device.

**carriage**

See *automatic carriage*.

**carriage control tape**

- (1) A tape that is used to control vertical tabulation of printing positions or *display* positions.
- (2) A tape that contains line feed control *data* for a printing device.

**carriage return**

The *operation* that prepares for the next *character* to be printed or *displayed* at the specified first *position* on the same line.

**carriage return character (CR)**

- (1) (ISO) A *format effector* that causes the print or *display position* to move to the first position on the same line.
- (2) A *format effector* that causes the location of the printing or display position to be moved to the first space on the same printing or display line.
- (3) Contrast with *new line character*.

**carry**

- (1) (ISO) The action of *transferring* a *carry digit*.
- (2) One or more *digits*, produced in connection with an arithmetic *operation* on one *digit place* of two or more *numerals* in *positional notation*, that are forwarded to another digit place for *processing* there.
- (3) The *number* represented by the *digit* or digits in (2).
- (4) Most commonly, a *digit* as defined in (2), that arises when the sum or product of two or more digits equals or exceeds the *radix* of the *number representation system*.
- (5) Less commonly, a *borrow*.
- (6) The *command* directing that a carry be forwarded.
- (7) (ISO) To *transfer* a *carry digit*.
- (8) To forward a carry.
- (9) See *addition without carry*, *cascaded carry*, *complete carry*, *end-around carry*, *high-speed carry*, *partial carry*, *standing-on-nines carry*.

**carry digit**

(ISO) A *digit* that is generated when a *sum* or a *product* in a *digit place* exceeds the largest *number* that can be represented in that digit place and that is *transferred* for *processing* elsewhere. In a *positional representation system*, a carry digit is transferred to the digit place with the next higher *weight* for processing there.

**cascaded carry**

- (1) (ISO) In *parallel addition*, a *procedure* in which the addition results in a *partial sum numeral* and a *carry numeral* which are in turn added; this *process* is repeated until no carries are generated.
- (2) Contrast with *high-speed carry*.

**catalog**

An *ordered* compilation of *item descriptions* and sufficient *information* to afford access to the items.

**cathode ray storage**

(ISO) An *electrostatic storage* that uses a cathode ray beam for access to *data*.

**cathode ray tube display (CRT display)**

- (1) A device that presents *data* in visual form by means of controlled electron beams.
- (2) The *data display* produced by the device as in (1).

**cell**

See *binary cell*, *magnetic cell*, *storage cell*.

**central processing unit (CPU)**

(ISO) A *unit* of a *computer* that includes circuits controlling the *interpretation* and *execution* of *instructions*. Synonymous with central processor, main frame.

**central processor**

Synonym for *central processing unit*.

**chad**

- (1) (ISO) The material separated from a *punched tape* or a *punched card* when forming a hole.
- (2) Synonymous with chip.

**chadless tape**

(ISO) *Punched tape* that has been

punched in such a way that *chad* is not formed.

### chain

- (1) See *Markov chain*.
- (2) See also *chained list*.

### chain code

An arrangement in a cyclic sequence of some or all of the possible different *n*-bit words, in which adjacent words are related such that each is derivable from its neighbor by displacing the *bits* one *digit position* to the left, or right, dropping the leading bit and inserting a bit at the end. The value of the inserted bit needs only to meet the requirement that a word must not recur before the cycle is complete, e.g., 000 001 010 101 011 111 110 100 000 ...

### chained list

(ISO) A *list* in which the *items* may be dispersed but in which each item contains an *identifier* for locating the next item.

### chaining search

(ISO) A *search* in which each *item* contains means for locating the next item to be considered in the search.

### chain printer

(ISO) An *impact printer* in which the type slugs are carried by the links of a revolving chain.

### change character

See *font change character*.

### change dump

(ISO) A *selective dump* of those *storage locations* whose contents have changed.

### channel

- (1) A path along which *signals* can be

sent, e.g., *data channel*, *output channel*.

- (2) The portion of a *storage medium* that is accessible to a given *reading* or *writing station*, e.g., *track*, *band*.
- (3) (ISO) In *information theory*, that part of a communication system that connects the *message source* with the *message sink*. Mathematically, this part can be characterized by the set of conditional probabilities of occurrence of all the possible *messages* received at the message sink when a given message emanates from the message source.
- (4) In *data communication*, a means of one way transmission. Contrast with *circuit*.
- (5) See *binary symmetric channel*, *input channel*, *input-output channel*, *output channel*.

### channel capacity

(ISO) The measure of the ability of a given *channel* subject to specific constraints to *transmit messages* from a specified *message source* expressed either as the maximum possible *mean transinformation content per character*, or as the maximum possible *average transinformation rate*.

### chapter

(ISO) Deprecated term for *segment*.

### character

- (1) (ISO) A member of a *set of elements* upon which agreement has been reached and that is used for the organization, control, or representation of *data*. *Characters* may be *letters*, *digits*, punctuation marks, or other *symbols*, often represented in the form of a spatial arrangement of adjacent or connected strokes or in the form of



other physical conditions in *data media*.

- (2) A *letter, digit, or other symbol* that is used as part of the organization, control, or representation of *data*. A character is often in the form of a spatial arrangement of adjacent or connected strokes.
- (3) See *accuracy control character, acknowledgment character, alphanumeric character set, alphanumeric character subset, backspace character, bell character, blank character, block cancel character, cancel character, carriage return character, check character, code extension character, control character, cyclic redundancy check character, data link escape character, delete character, device control character, end-of-medium character, end-of-text character, end-of-transmission-block character, end-of-transmission character, enquiry character, erase character, escape character, font change character, form feed character, gap character, graphic character, group separator character, horizontal tabulation character, illegal character, line feed character, negative acknowledge character, new-line character, null character, print control character, redundancy check character, shift-in character, shift-out character, sign character, space character, special character, start-of-heading character, start-of-text character, substitute character, synchronous idle character, transmission control character, vertical tabulation character*.

**character-at-a-time printer**

Synonym for *character printer*.

**character average information content**

(ISO) Synonym for *character mean entropy*.

**character boundary**

In *character recognition*, the largest rectangle, with a side parallel to the *document reference edge*, each of whose sides is tangential to a given *character outline*.

**character check**

A *check* that verifies the observance of rules for the formation of *characters*.

**character display device**

(ISO) A *display device* that gives a representation of *data* only in the form of *characters*. Synonymous with *read-out device*.

**character fill**

(ISO) To insert as often as necessary into a *storage medium* the representation of a specified *character* that does not itself convey *data* but may delete unwanted *data*.

**character information rate**

(ISO) Synonym for *character mean entropy*.

**characteristic**

- (1) (ISO) In a *floating-point representation*, the *numeral* that represents the *exponent*.
- (2) (ISO) The *integer* part, which may be positive or negative, of the representation of a logarithm.
- (3) Contrast with *mantissa*.

**character mean entropy**

(ISO) In *information theory*, the mean per *character* of the entropy for all possible *messages* from a *stationary message source*; in mathematical notation, if  $H_m$  is the entropy of the set of all sequences of  $m$  characters from the source, then this

mean per character  $H'$  equals:

$$H' = \lim_{m \rightarrow \infty} \frac{H_m}{m}$$

The mean entropy per character may be expressed in a unit such as a *Shannon* per character. Synonymous with character average information content, character information rate, character mean information content.

#### character mean information content

(ISO) Synonym for *character mean entropy*.

#### character mean transinformation content

(ISO) In *information theory*, the mean per character of the *mean transinformation content* for all possible *messages* from a *stationary message source*; in mathematical notation, if  $T_m$  is the mean transinformation content for all pairs of corresponding input and output sequences of  $m$  characters, then this mean per character  $T'$  equals:

$$T' = \lim_{m \rightarrow \infty} \frac{T_m}{m}$$

The mean transinformation content per character may be expressed in a unit such as *Shannon* per character.

#### character outline

The *graphic* pattern established by the *stroke edges* of a *character*.

#### character printer

(1) (ISO) A device that prints a single *character* at a time, e.g., a typewriter.

Synonymous with *character-at-a-time printer*.

(2) Contrast with *line printer*, *page printer*.

#### character reader

(ISO) An *input unit* that performs *character recognition*.

#### character recognition

(1) (ISO) The identification of *characters* by *automatic means*.

(2) See *magnetic ink character recognition*, *optical character recognition*, *pattern recognition*.

#### character set

(1) (ISO) A finite *set* of different *characters* upon which agreement has been reached and that is considered complete for some purpose, e.g., each of the character sets in ISO Recommendation R646 "6- and 7-bit coded character sets for information processing interchange".

(2) An *ordered set* of unique representations called *characters*, e.g., the 26 *letters* of the English *alphabet*, *boolean* 0 and 1, the set of *symbols* in the Morse code, and the 128 *ASCII* characters.

(3) See *alphabetic character set*, *alphabetic coded character set*, *alphanumeric character set*, *alphanumeric coded character set*, *coded character set*, *numeric character set*, *numeric coded character set*.

#### character spacing reference line

In *character recognition*, a vertical line that is used to evaluate the horizontal spacing of *characters*. It may be a line that equally divides the distance between the sides of a character boundary or that coincides with the centerline of a vertical *stroke*.

**character string**

(ISO) A *string* consisting solely of *characters*.

**character subset**

- (1) (ISO) A selection of *characters* from a *character set*, comprising all characters that have a specified common feature, e.g., in each of the character sets of ISO Recommendation R646 "6- and 7-bit coded character sets for information processing interchange", the *digits* 0 to 9 may constitute a character subset.
- (2) See *alphabetic character subset*, *alphanumeric character subset*, *numeric character subset*.

**check**

- (1) A *process* for determining *accuracy*.
- (2) See *automatic check*, *character check*, *duplication check*, *echo check*, *marginal check*, *mathematical check*, *parity check*, *programmed check*, *residue check*, *selection check*, *sight check*, *summation check*, *transfer check*.

**check bit**

- (1) A *binary check digit*, e.g., a *parity bit*.
- (2) See *redundancy check bit*.

**check card**

- (1) A *punched card* suitable for use as a bank check.
- (2) A *punch card* used for *checking*.

**check character**

A *character* used for the purpose of performing a *check*.

**check digit**

A *digit* used for the purpose of performing a *check*.

**checking program**

(ISO) A *computer program* that examines

other computer programs or *sets of data* for *mistakes of syntax*.

**checkout**

Synonym for *debug*.

**checkpoint**

(ISO) A place in a *computer program* at which a *check* is made or at which a recording of *data* is made for *restart* purposes.

**Chinese binary**

Synonym for *column binary*.

**chip**

- (1) A minute piece of semiconductive material used in the manufacture of electronic components.
- (2) An integrated circuit on a piece of semiconductive material.
- (3) In *micrographics*, a piece of *microfilm* smaller than a *microfiche* containing *microimages* and *coded* identification.
- (4) (ISO) Synonym for *chad*.

**cine-oriented image**

- (1) In *micrographics*, an image appearing on a roll of *microfilm* in such a manner that the top edge of the image is perpendicular to the long edge of the film.
- (2) Contrast with *comic-strip oriented image*.

**circuit**

- (1) In *data communication*, a means of two-way communication between two *data terminal* installations.
- (2) Contrast with *channel*.
- (3) See *bistable circuit*, *combinational circuit*, *monostable circuit*, *sequential circuit*, *trigger circuit*.

**circular shift**

Synonym for *end-around shift*.

**circulating register**

A *shift register* in which *data* moved out of one end of the *register* are reentered into the other end as in a *closed loop*.

**circulating storage**

*Dynamic storage* involving a *closed loop*.  
Synonymous with *cyclic storage*.

**clear**

- (1) (ISO) To put one or more *storage locations* or *registers* into a prescribed state, usually that denoting *zero*.
- (2) (ISO) To cause one or more *storage locations* to be in a prescribed state, usually that corresponding to *zero* or that corresponding to the *space character*.

**clear area**

In *character recognition*, a specified area that is to be kept free of printing or any other markings not related to machine *reading*.

**clock**

- (1) (ISO) A device that generates periodic *signals* from which synchronism may be maintained.
- (2) A device that measures and indicates time.
- (3) A *register* whose content changes at regular intervals in such a way as to measure time.
- (4) (ISO) Deprecated term for *timer*.

**clock pulse**

- (1) A synchronization *signal* provided by a *clock*.
- (2) (ISO) Synonym for *clock signal*.

**clock register**

(ISO) Synonym for *timer*.

**clock signal**

(ISO) The *output* of a device that gener-

ates periodic *signals* used for synchronization. Synonymous with *clock pulse*.

**clock track**

(ISO) A *track* on which a pattern of *signals* is recorded to provide a timing reference.

**closed loop**

(ISO) A *loop* that has no *exit* and whose *execution* can be *interrupted* only by intervention from outside the *computer program* in which the loop is included.

**closed shop**

- (1) Pertaining to the *operation* of a *computer* facility in which most productive problem *programming* is performed by a group of programming specialists rather than the problem originators. The use of the computer itself may also be described as closed shop if full time trained *operators*, rather than user/programmers serve as the operators.
- (2) Contrast with *open shop*.

**closed subroutine**

- (1) (ISO) A *subroutine* of which one replica suffices for the subroutine to be *linked* by *calling sequences* for use at more than one place in a *computer program*.
- (2) Contrast with *open subroutine*.

**coalesce**

- (1) (ISO) To combine two or more *sets* of *items* into one set of any form.
- (2) To combine two or more *files* into one file.

**coated card**

See *edge-coated card*.

**COBOL(common business oriented language)**

A *programming language* designed for *business data processing*.

**code**

- (1) (ISO) A *set* of unambiguous rules specifying the manner in which *data* may be represented in a *discrete* form. Synonymous with *coding scheme*.
- (2) A *set* of *items*, such as abbreviations, representing the members of another *set*.
- (3) (ISO) To represent *data* or a *computer program* in a symbolic form that can be accepted by a *data processor*.
- (4) To write a *routine*.
- (5) (ISO) Deprecated term for *coded representation*, *code set*.
- (6) (ISO) Synonym for *coded representation*.
- (7) Synonym for *coded character set*.
- (8) See *alphabetic code*, *alphanumeric code*, *binary code*, *biquinary code*, *chain code*, *computer instruction code*, *data code*, *error correcting code*, *error detecting code*, *excess-three code*, *gray code*, *hamming code*, *interpretive code*, *minimum distance code*, *numeric code*, *object code*, *operation code*, *perforated tape code*, *pseudo code*, *retrieval code*, *return code*, *skeletal code*, *two-out-of-five code*.

**code area**

In *micrographics*, a part of the *film frame* reserved for *retrieval code*.

**code converter**

(ISO) A *data converter* that changes the representation of *data*, using one *code* in the place of another or one *coded character set* in the place of another.

**coded character set**

- (1) (ISO) A *set* of unambiguous rules that establish a *character set* and the one-to-one relationships between the

*characters* of the *set* and their *coded representations*. Synonymous with *code*.

- (2) See *alphabetic coded character set*, *alphanumeric coded character set*, *numeric coded character set*.

**coded decimal notation**

Synonym for *binary-coded decimal notation*.

**coded representation**

(ISO) The representation of an *item* of *data* established by a *code* or the representation of a *character* established by a *coded character set*, e.g., "ORY" as the representation of Paris (Orly) in the code for 3-letter identification for airports; the seven *binary elements* representing the *delete character* in the ISO 7-bit *coded character set*. Synonymous with *code*, *code element*, *code value*.

**code element**

Synonym for *coded representation*.

**code extension character**

(ISO) Any *control character* used to indicate that one or more of the succeeding *coded representations* are to be *interpreted* according to a different *code* or according to a different *coded character set*.

**code line index**

In *micrographics*, a visual index consisting of an optical pattern of clear and opaque bars parallel to the long edge of the roll *microfilm* and located between images.

**code position**

(ISO) Synonym for *punch position*.

**coder**

A person who writes but does not usually design *computer programs*.



**code set**

(ISO) The complete set of representations defined by a *code*, or by a *coded character set*, e.g., all of the three-letter international identifications for airports.

**code value**

(ISO) Synonym for *coded representation*.

**coding**

See *absolute coding*, *relative coding*, *straight line coding*, *symbolic coding*.

**coding scheme**

Synonym for *code (1)*.

**collate**

(1) (ISO) To alter the arrangement of a set of *items* from two or more *ordered subsets* to one or more other subsets each containing a number of items, commonly one, from each of the original subsets in a specified order that is not necessarily the order of any of the original subsets.

(2) See also *merge*.

**collating sequence**

(1) (ISO) A specified arrangement used in *sequencing*. Synonymous with *sequence*.

(2) An *ordering* assigned to a set of *items* such that any two sets in that assigned order can be *collated*.

(3) (ISO) Deprecated term for *order (1)*.

**collator**

A device that *collates*, *merges*, or *matches* sets of *punched cards* or other *documents*.

**color**

In *optical character recognition*, the spectral appearance of the image dependent upon the spectral reflectance of the image, the *spectral response* of the observer, and the spectral composition of incident light.

**column**

(1) A vertical arrangement of *characters* or other expressions.

(2) Contrast with *row*.

(3) See *card column*, *mark-sensing column*, *punch column*.

**column binary**

(1) Pertaining to the *binary* representation of *data* on cards in which the *weights* of *punch positions* are assigned along *card columns*. For example, each column in a 12-row card may be used to represent 12 consecutive *bits*. Synonymous with *Chinese binary*.

(2) Contrast with *row binary*.

**column split**

The capability of a *punch card* device to *read* or *punch* two parts of a *card column* independently.

**COM**

(1) *Computer output microfilm*.

(2) *Computer output microfilmer*.

**combination**

(1) (ISO) A given number of different *elements* selected from a *set* without regard to the *order* in which the selected elements are arranged.

(2) Contrast with *permutation*.

(3) See *forbidden combination*.

**combinational circuit**

(ISO) A *logic device* whose *output* values, at any given instant, depend only upon the *input* values at that time. A combinational circuit is a special case of a *sequential circuit* that does not have a *storage* capability. Synonymous with *combinatorial circuit*.

**combinational logic element**

(1) A device having at least one *output channel* and zero or more *input chan-*

*nels*, all characterized by *discrete* states, such that at any instant the state of each output channel is completely determined by the states of the input channels at the same instant.

- (2) Contrast with *sequential logic element*.

**combinatorial circuit**

Synonym for *combinational circuit*.

**combined head**

(ISO) Synonym for *read/write head*.

**comic-strip oriented image**

- (1) In *micrographics*, an image appearing on roll *microfilm* in such a manner that the top edge of the image is parallel to the long edge of the film.
- (2) Contrast with *cine-oriented image*.

**command**

- (1) A control *signal*.
- (2) Loosely, an *instruction*.
- (3) Loosely, a mathematical or logic *operator*.
- (4) Deprecated term for *instruction*.

**command language**

A *source language* consisting primarily of procedural *operators*, each capable of invoking a *function* to be *executed*.

**comment**

(ISO) A description, reference, or explanation, added to or interspersed among the *statements* of the *source language*, that has no effect in the *target language*. Synonymous with computer program annotation.

**common field**

A *field* that can be accessed by two or more independent *routines*.

**communication**

See *data communication*.

**communication control character**

(ISO) Synonym for *transmission control character*.

**communication theory**

- (1) (ISO) The mathematical discipline dealing with the probabilistic features of the transmission of *data* in the presence of *noise*.
- (2) (ISO) Deprecated term for *information theory*.

**comparator**

- (1) (ISO) A device that *compares* two *items* of *data* and indicates the *result* of that comparison.
- (2) A device for determining the dissimilarity of two *items* such as two *pulse* patterns or *words*.

**compare**

(ISO) To examine two *items* to discover their relative magnitudes, their relative positions in an *order* or in a *sequence*, or whether they are identical in given characteristics.

**comparison**

- (1) The *process* of examining two or more *items* for identity, similarity, equality, relative magnitude, or for *order* in a *sequence*.
- (2) See *logical comparison*.

**compile**

- (1) (ISO) To *translate* a *computer program* expressed in a *problem-oriented language* into a *computer-oriented language*.
- (2) To prepare a *machine language* program from a *computer program* written in another *programming language* by making use of the overall logic structure of the program, or *generating* more than one *computer instruction* for each *symbolic statement*, or

both, as well as performing the *function* of an *assembler*.

#### **compile-and-go**

An operating technique in which there are no stops between the *compiling*, *loading*, and *execution* of a *computer program*.

#### **compile duration**

(ISO) Synonym for *compiling time*.

#### **compile phase**

(ISO) Of a *run*, the logical subdivision that includes the *execution* of the *compiler*. Synonymous with *compiling phase*.

#### **compiler**

(ISO) A *computer program* used to *compile*. Synonymous with *compiling program*.

#### **compiler generator**

(ISO) A *translator* or an *interpreter* that is used to construct *compilers*.

#### **compiling phase**

(ISO) Synonym for *compile phase*.

#### **compiling program**

(ISO) Synonym for *compiler*.

#### **compiling time**

(ISO) The elapsed time taken for the *execution* of a *compiler*. Synonymous with *compile duration*.

#### **complement**

(1) (ISO) In a *fixed-radix numeration system*, a *numeral* that can be derived from a given numeral by *operations* that include subtracting each *digit* of the *digital representation* of the given number from the corresponding digit of the digital representation of a specified number.

(2) A number that can be derived from a

specified number by subtracting it from a second specified number. For example, in *radix notation*, the second specified number may be a given power of the *radix* or one less than a given power of the *radix*. The negative of a number is often represented by its complement.

(3) See *diminished radix complement*, *nines complement*, *ones complement*, *radix complement*, *tens complement*, *twos complement*.

#### **complementary operation**

(ISO) Of a *boolean operation*, another boolean operation whose *result*, when it is performed on the same *operands* as the first boolean operation, is the *negation* of the result of the first boolean operation.

#### **complementary operator**

The logic operator whose *result* is the *NOT* of a given logic operator.

#### **complement base**

(ISO) In a *fixed-radix numeration system*, the specified number whose *digital representation* contains the *digits* from which the corresponding digits of the given number are subtracted in obtaining a *complement* of the given number.

#### **complementer**

(ISO) A device whose *output data* are a representation of the *complement* of the number represented by its *input data*.

#### **complement-on-nine**

(ISO) Synonym for *nines complement*.

#### **complement-on-one**

(ISO) Synonym for *ones complement*.

#### **complement-on-ten**

(ISO) Synonym for *tens complement*.

**complement-on-two**

(ISO) Synonym for *twos complement*.

**complete carry**

- (1) (ISO) In *parallel addition*, a procedure in which each of the *carries* is immediately *transferred*.
- (2) Contrast with *partial carry*.

**complex number**

(ISO) A *number* consisting of an ordered pair of real numbers, expressible in the form  $a+bi$ , where  $a$  and  $b$  are real numbers and  $i$  squared equals minus one.

**component**

See *solid state component*.

**computational stability**

The degree to which a computational process remains valid when subjected to effects such as *errors*, *mistakes*, or *malfunctions*.

**computer**

- (1) (ISO) A *data processor* that can perform substantial computation, including numerous *arithmetic operations* or *logic operations*, without intervention by a human operator during a *run*.
- (2) See *analog computer*, *arbitrary sequence computer*, *asynchronous computer*, *consecutive sequence computer*, *digital computer*, *general purpose computer*, *hybrid computer*, *incremental computer*, *parallel computer*, *self-adapting computer*, *self-organizing computer*, *sequential computer*, *serial computer*, *simultaneous computer*, *special purpose computer*, *stored program computer*, *synchronous computer*.

**computer architecture**

The specification of the relationships between the parts of a *computer system*.

**computer assisted management**

(ISO) Management performed with the aid of *automatic data processing*.

**computer-dependent language**

Synonym for *assembly language*.

**computer graphics**

(ISO) That branch of science and technology concerned with methods and techniques for converting any form of *information* to or from *graphic display* via *computers*.

**computer instruction**

(ISO) An *instruction* that can be recognized by the *central processing unit* of the *computer* for which it is designed. Synonymous with *machine instruction*.

**computer instruction code**

(ISO) A *code* used to represent the *instructions* in an *instruction set*. Synonymous with *machine code*.

**computer instruction set**

A complete *set* of the *operators* of the *instructions* of a *computer* together with a description of the types of meanings that can be attributed to their *operands*. Synonymous with *machine instruction set*.

**computer language**

- (1) (ISO) A *computer-oriented language* whose *instructions* consist only of *computer instructions*. Synonymous with *machine language*.
- (2) (ISO) Deprecated term for *computer-oriented language*.

**computer network**

A complex consisting of two or more interconnected *computers*.



**computer operation**

One of the elementary operations which a computer is designed to perform. Synonymous with machine operation.

**computer-oriented language**

- (1) (ISO) A programming language that reflects the structure of a given computer or that of a given class of computers.
- (2) A programming language whose words and syntax are designed for use on a specific class of computers. Synonymous with machine-oriented language.
- (3) See also *computer language*.

**computer output microfilm (COM)**

- (1) (ISO) Microfilm that contains data that is received directly from computer-generated signals.
- (2) To place computer-generated data on microfilm.

**computer output microfilmer (COM)**

A recording device that produces computer output microfilm.

**computer program**

(ISO) A program expressed in a form suitable for execution by a computer.

**computer program annotation**

(ISO) Synonym for *comment*.

**computer program origin**

The address assigned to the initial storage location of a computer program in main storage.

**computer simulator**

(ISO) A computer program that translates computer programs prepared for a computer of one model for execution on a computer of a different model.

**computer time**

In *simulation*, the time required to process the data that represents a process or that represents a part of a process.

**computer word**

- (1) (ISO) A word stored in one computer location and capable of being treated as a unit. Synonymous with fullword, machine word.
- (2) See also *halfword*.

**concurrent**

- (1) (ISO) Pertaining to the occurrence of two or more activities within a given interval of time.
- (2) Contrast with *simultaneous*.
- (3) See also *consecutive*, *sequential*.

**concurrent operation**

A mode of operation that includes the performance of two or more operations within a given interval of time.

**condition**

See *restart condition*.

**conditional branch instruction**

(ISO) Deprecated term for *conditional jump instruction*.

**conditional control transfer instruction**

(ISO) Deprecated term for *conditional jump instruction*.

**conditional entropy**

(ISO) In *information theory*, the mean of the measure of information conveyed by the occurrence of any one of a finite set of mutually exclusive and jointly exhaustive events of definite conditional probabilities, given the occurrence of events of another set of mutually exclusive events; in mathematical notation, this means  $H(x|y)$  for a set of events  $x_1, \dots, x_n$  which are dependent on the occurrence of events



from another set  $y_1, \dots, y_m$  with joint probabilities  $p(x_i, y_j)$  of the occurrence of both events  $x_i, y_j$  equals the mathematical expectation of the *conditional information content*  $I(x_i | y_j)$  of all pairs of events:

$$H(x | y) = \sum_{i=1}^{i=n} \sum_{j=1}^{j=m} p(x_i, y_j) I(x_i | y_j) = \sum_{i=1}^{i=n} \sum_{j=1}^{j=m} p(x_i, y_j) \log \frac{1}{p(x_i | y_j)}$$

Synonymous with average conditional information content, mean conditional information content.

#### conditional implication operation

(ISO) Synonym for *implication*.

#### conditional information content

(ISO) In *information theory*, a *measure of information* conveyed by the occurrence of an event of a definite conditional probability, given the occurrence of another event; in mathematical notation, this measure  $I(x_i | y_j)$  for an event from the set  $x_1, \dots, x_n$ , that is dependent on the occurrence of another event from the set  $y_1, \dots, y_m$ , equals the logarithm of the reciprocal of the conditional probability  $p(x_i | y_j)$  of the occurrence of the event  $x_i$  given the occurrence of the event  $y_j$

$$I(x_i | y_j) = \log \frac{1}{p(x_i | y_j)}$$

#### conditional jump

(ISO) A *jump* that takes place only when the *instruction* that specifies it is *executed* and specified conditions are satisfied.

#### conditional jump instruction

(ISO) An *instruction* that specifies a *conditional jump* and the conditions that have to be satisfied for the conditional jump to occur.

#### conditional statement

A *statement* used to express an assignment or *branch*, based on specified criteria, e.g., an IF-THEN statement.

#### conditional transfer instruction

(ISO) Deprecated term for *conditional jump instruction*, *jump instruction*.

#### conditions

See *entry conditions*.

#### conjunction

- (1) (ISO) The *boolean operation* whose *result* has the boolean value 1 if and only if each *operand* has the boolean value 1. Synonymous with AND operation, intersection.
- (2) Contrast with *nonconjunction*.

#### connector

- (1) (ISO) A *flowchart symbol* that represents a break in a *flowline*, the same flowline being continued elsewhere.
- (2) See *inconnector*, *outconnector*.

#### consecutive

- (1) (ISO) Pertaining to the occurrence of two *sequential* events without the intervention of any other such event.
- (2) Contrast with *sequential*.
- (3) See also *concurrent*, *simultaneous*.

#### consecutive operation

Synonym for *sequential operation*.

#### consecutive sequence computer

(ISO) A *computer* in which *instructions* are *executed* in an implicitly defined *sequence* unless a *jump instruction* specifies

the *storage location* of the next instruction to be executed.

#### console

- (1) A part of a *computer* used for communication between the *operator* or *maintenance engineer* and the *computer*.
- (2) See *operator console*.

#### constant

See *figurative constant*.

#### content

See *character mean transinformation content*, *conditional information content*, *decision content*, *information content*, *joint information content*, *mean transinformation content*, *transinformation content*.

#### content-addressed storage

Synonym for *associative storage*.

#### continuous-form cards

Special cards attached together in continuous strips to facilitate printing. They can be separated into individual *punched cards*.

#### contrast

- (1) In *optical character recognition*, the differences between *color* or *shading* of the printed material on a *document* and the background on which it is printed.
- (2) See *print contrast ratio*.

#### control

See *loop control*, *numerical control*, *process control*, *real-time control*, *sequential control*.

#### control character

- (1) (ISO) A *character* whose occurrence in a particular context initiates, modifies, or stops a *control operation*. A con-

trol character may be recorded for use in a subsequent action. A control character is not a *graphic character*, but may have a graphic representation in some circumstances.

- (2) See *accuracy control character*, *device control character*, *print control character*, *transmission control character*.

#### control counter

(ISO) Synonym for *instruction address register*.

#### control engineering

See *automatic control engineering*.

#### control function

(ISO) Synonym for *control operation*.

#### control hole

(ISO) Synonym for *designation hole*.

#### control instruction register

(ISO) Deprecated term for *instruction address register*.

#### control language

See *job control language*.

#### controller

See *input-output controller*.

#### control operation

- (1) (ISO) An action that affects the *recording*, *processing*, *transmission* or *interpretation* of *data*, e.g., starting or stopping a process, *carriage return*, *font change*, *rewind* and *end of transmission*.
- (2) (ISO) Synonymous with *control function*.

#### control panel

- (1) A part of a *computer console* that contains manual controls.
- (2) Synonym for *plugboard*.

(3) See *operator control panel*.

### control program

A *computer program* designed to schedule and supervise the *execution* of all the *programs*, *routines*, and *subroutines* of a *computing system*.

### control punch

(ISO) Synonym for *designation hole*.

### control register

(ISO) Deprecated term for *instruction address register*.

### control tape

See *carriage control tape*.

### control unit

See *instruction control unit*, *main control unit*, *peripheral control unit*.

### control variable

See *loop control variable*.

### conversational mode

A mode of *operation* of a *data processing system* in which a *sequence* of alternating entries between a user and the system takes place in a manner similar to a conversation between two persons.

### convert

(1) (ISO) To change the representation of *data* from one form to another, without changing the information they convey, e.g., *radix* conversion; *code* conversion; conversion from *punched cards* to *magnetic tape*; *analog* to *digital* conversion.

(2) Synonymous with *transform*.

(3) See also *copy*, *duplicate*.

### converter

See *code converter*, *data converter*.

### convex programming

(1) (ISO) In *operations research*, a particular case of *nonlinear programming* in which the *function* to be maximized or minimized and the constraints are appropriately convex or concave functions of the controllable variables.

(2) Contrast with *dynamic programming*, *integer programming*, *linear programming*, *mathematical programming*, *nonlinear programming*, *quadratic programming*.

### copy

(ISO) To *read data* from a source, leaving the source data unchanged, and to *write* the same data elsewhere in a physical form that may differ from that of the source, e.g., to copy a *deck* of *punched cards* onto *magnetic tape*. The degree of *editing* that may be carried out at the same time depends upon the circumstances in which the copying is performed. Certain synonyms for "to copy" are used in certain contexts depending on the source and the destination of the data, as shown in the following table:

Source			Destination
External Storage or Input	Internal Storage	A Register	
To read	To load	To load	
To read	To move	To store	
To transmit or to read or to write	To write	To write	External Storage or Output

### core

(1) (ISO) Deprecated term for *tape spool*.

- (2) See *magnetic core, multi-aperture core, switch core.*

#### core storage

- (1) A *magnetic storage* in which the *data medium* consists of *magnetic cores.*  
 (2) See *magnetic core storage.*

#### corrective maintenance

- (1) *Maintenance* specifically intended to eliminate an existing *fault.*  
 (2) Contrast with *preventive maintenance.*

#### corrective maintenance time

Time, either scheduled or unscheduled, used to perform *corrective maintenance.*

#### counter

- (1) (ISO) A device whose state represents a number and that, on receipt of an appropriate *signal*, causes the *number* represented to be increased by unity or by an arbitrary constant; the device is usually capable of bringing the number represented to a specified value, e.g., zero.  
 (2) See *instruction counter, modulo-n counter, reversible counter.*

#### CPU

*Central processing unit.*

#### CR

- (1) An abbreviation denoting a credit symbol in the amount *field.*  
 (2) The *carriage return character.*

#### CRC

The *cyclic redundancy check character.*

#### crosstalk

The unwanted energy transferred from one *circuit*, called the disturbing circuit, to another circuit, called the disturbed circuit.

#### CRT display

*Cathode ray tube display.*

#### cryogenics

The study and use of devices utilizing properties of materials near absolute zero in temperature.

#### cryogenic storage

(ISO) A *storage device* that uses the superconductive and magnetic properties of certain materials at very low temperatures.

#### cryotron

A device that makes use of the effects of low temperatures on conductive materials such that small magnetic field changes can control large current changes.

#### cue

Synonym for *call.*

#### curtate

- (1) A group of adjacent *card rows.*  
 (2) See *lower curtate, upper curtate.*

#### curve follower

(ISO) An *input unit* that reads *data* represented by a curve.

#### cybernetics

(ISO) The branch of learning that brings together theories and studies on communication and control in living organisms and in machines.

#### cycle

- (1) An interval of space or time in which one set of events or phenomena is completed.  
 (2) Any set of *operations* that is repeated regularly in the same *sequence.* The operations may be subject to variations on each repetition.  
 (3) See *search cycle.*

**cycle time**

- (1) (ISO) The minimum time interval between the starts of successive read/write cycles of a *magnetic core storage*.
- (2) See *read cycle time*, *write cycle time*.

**cyclic redundancy check character (CRC)**

A character used in a modified *cyclic code* for error detection and correction.

**cyclic shift**

Synonym for *end-around shift*.

**cyclic storage**

Synonym for *circulating storage*.



## D

**data**

- (1) (ISO) A representation of facts, concepts, or *instructions* in a formalized manner suitable for communication, interpretation, or processing by humans or by *automatic* means.
- (2) Any representations such as *characters* or *analog* quantities to which meaning is or might be assigned.
- (3) See *alphanumeric data*, *analog data*, *digital data*, *discrete data*, *input data*, *numeric data*, *output data*.

**data attribute**

A characteristic of a unit of *data* such as length, value, or method of representation.

**data bank**

- (1) (ISO) A set of *libraries* of *data*.
- (2) A comprehensive collection of *libraries* of *data*. For example, one line of an invoice may form an *item*, a complete invoice may form a *record*, a complete set of such records may form a *file*, the collection of inventory control files may form a *library*, and the libraries used by an organization are known as its data bank.

**data base**

- (1) (ISO) A set of *data*, part or the whole of another set of *data*, and consisting of at least one *file*, that is sufficient for a given purpose or for a given *data processing system*.
- (2) A collection of *data* fundamental to a *system*.
- (3) A collection of *data* fundamental to an enterprise.

**data card**

See *source data card*.

**data code**

- (1) A structured set of *characters* used to represent *data items*, e.g., the codes 01, 02, ..., 12 may be used to represent the months January, February, ..., December of the data element months of the year.
- (2) (ISO) In *data communication*, a set of rules and conventions according to which the *signals* representing *data* should be formed, *transmitted*, received and *processed*.
- (3) (ISO) Deprecated term for *code set*.

**data collection station**

(ISO) Synonym for *data input station*.

**data communication**

- (1) The *transmission* and reception of *data*.
- (2) The *transmission*, reception, and *validation* of *data*.

**data converter**

(ISO) A device whose purpose is to *convert data*.

**data definition**

A *program statement* that describes the features of, specifies relationships of, or establishes context of *data*.

**data flowchart**

(ISO) A *flowchart* that represents the path of *data* in the solving of a problem, and that defines the major phases of the *processing* as well as the various *data media* used. Synonymous with *data flow diagram*.

**data flow diagram**

(ISO) Synonym for *data flowchart*.

**data hierarchy**

A *data structure* consisting of *sets* and

*subsets* such that every subset of a set is of lower rank than the data of the set.

**data input station**

(ISO) A *user terminal* primarily for the insertion of *data* into a *data processing system*. Synonymous with *data collection station*.

**data library**

(ISO) A collection of related *files*, e.g., in stock control, a collection of inventory control files.

**data link**

The physical means of connecting one location to another for the purpose of *transmitting* and receiving *data*.

**data link escape character (DLE)**

(ISO) A *transmission control character* that changes the meaning of a limited number of contiguously following *characters* or *coded representations* and that is used exclusively to provide supplementary transmission control characters.

**data logging**

The recording of *data* about events that occur in time sequence.

**data management**

- (1) The function of controlling the acquisition, *analysis*, *storage*, retrieval, and distribution of *data*.
- (2) In an *operating system*, the *computer programs* that provide access to *data*, perform or monitor *storage* of *data*, and control *input-output* devices.

**data medium**

- (1) (ISO) The material in or on which a specific physical variable may represent *data*.
- (2) (ISO) The physical quantity which may be varied to represent *data*.

**data name**

(ISO) A *character* or group of characters used to identify an *item* of *data*.

**data processing**

- (1) (ISO) The *execution* of a systematic sequence of *operations* performed upon *data*, e.g., *handling*, *merging*, *sorting*, computing. Synonymous with *information processing*.
- (2) See *administrative data processing*, *automatic data processing*, *business data processing*, *electronic data processing*, *integrated data processing*.

**data processing system**

(ISO) A collection of methods, *procedures*, or techniques united by regulated interaction to form an organized whole.

**data processor**

(ISO) A device capable of performing *data processing*, such as a desk *calculator*, a *punched card* machine, or a *computer*. Synonymous with *processor*(1).

**data reduction**

The transformation of raw *data* into a more useful form, e.g., *smoothing* to reduce *noise*.

**data signalling rate**

In *data communication*, the *data transmission* capacity of a set of *parallel channels*. The data signalling rate is expressed in *bits* per second.

**data sink**

- (1) In *data communication*, a device capable of accepting *data signals* from a *transmission* device. It may also check these signals and originate *error control* signals.
- (2) Contrast with *data source*.

**data source**

- (1) In *data communication*, a device capable of originating *data signals* for a *transmission* device. It may also accept *error control* signals.
- (2) Contrast with *data sink*.

**data terminal equipment**

A *data source*, a *data sink*, or both.

**data transmission**

Synonym for *transmission*.

**datum line**

See *X-datum line*, *Y-datum line*.

**DC1, DC2, DC3, DC4**

*Device control characters*.

**DDA**

*Digital differential analyzer*.

**deblock**

To separate the parts of *blocks*, e.g., to select *records* from a block.

**debug**

(ISO) To detect, to trace, and to eliminate *mistakes* in *computer programs* or in other *software*. Synonymous with *check-out*.

**decimal**

- (1) (ISO) Pertaining to a selection, choice, or condition that has ten possible different values or states.
- (2) (ISO) Pertaining to a *fixed-radix numeration system* having a *radix* of ten. Synonymous with *denary*.
- (3) See *binary-coded decimal notation*.

**decimal digit**

(ISO) In *decimal notation*, or in the *decimal numeration system*, one of the *digits* 0 to 9.

**decimal notation**

- (1) (ISO) A *notation* that uses ten different *characters*, usually the *decimal digits*, e.g., the *character string* 196912312359, construed to represent the date and time one minute before the start of the year 1970; the representation used in the Universal Decimal Classification (UDC). These examples use decimal notation but neither satisfies the definition of the *decimal numeration system*.
- (2) Contrast with *decimal numeration system*.

**decimal numeral**

A *numeral* in the *decimal numeration system*.

**decimal numeration system**

- (1) (ISO) The *fixed radix numeration system* that uses the *decimal digits* and the *radix* ten and in which the lowest integral *weight* is 1, e.g., in this *numeration system*, the numeral 576.2 represents the number:  $5 \times 10^2 + 7 \times 10^1 + 6 \times 10^0 + 2 \times 10^{-1}$ .
- (2) Contrast with *decimal notation*.

**decimal point**

(ISO) The *radix point* in the *decimal numeration system*. The decimal point may be represented, according to various conventions, by a comma, by a period, or by a point at the mid-height of the *digits*.

**decision**

See *leading decision*, *trailing decision*.

**decision content**

(ISO) In *information theory*, a logarithmic measure of the number of decisions needed to select a given event among a finite number of mutually exclusive events; in mathematical *notation*, this measure is:

$$H_0 = \log_n$$

where  $n$  is the number of events. In information theory, the term event is to be understood as used in the theory of probability. For instance, an event may be the presence of a given *element* of a *set*, the occurrence of a specified *character* or of a specified *word* in a given *position* of a *message*.

#### decision instruction

- (1) (ISO) Deprecated term for *discrimination instruction*.
- (2) (ISO) Synonym for *branch instruction*.

#### decision table

- (1) (ISO) A table of all contingencies that are to be considered in the description of a problem together with the actions to be taken.
- (2) A presentation in either matrix or tabular form of a *set* of conditions and their corresponding actions.

#### deck

See *card deck*.

#### declaration

(ISO) In a *programming language*, a meaningful *expression* that affects the *interpretation* of other expressions in that language. Synonymous with *directive*.

#### declarative

(ISO) Deprecated term for *declaration*.

#### decode

- (1) (ISO) To *convert data* by reversing the effect of some previous *encoding*.
- (2) To interpret a *code*.
- (3) Contrast with *encode*.

#### decoder

- (1) (ISO) A device that *decodes data*.
- (2) (ISO) A device that has a number of *input* lines of which any number may carry *signals* and a number of *output* lines of which not more than one may carry a signal, there being a one-to-one correspondence between the outputs and the combinations of the input signals.
- (3) Contrast with *encoder*.
- (4) See *operation decoder*.

#### decollate

To separate the plies of a multipart form or paper stock. Synonymous with *deleave*.

#### default option

An implicit option that is assumed when no option is explicitly stated.

#### deferred addressing

(ISO) A method of *addressing* in which one *indirect address* is replaced by another to which it refers a predetermined number of times or until the *process* is terminated by an *indicator*.

#### deferred maintenance

*Maintenance* specifically intended to eliminate an existing *fault*, which did not prevent continued successful *operation* of the device or *computer program*.

#### deferred maintenance time

Time, usually scheduled, used to perform *deferred maintenance*.

#### definition

See *data definition*, *macro definition*.

#### DEL

The *delete character*.

**delay**

The amount of time by which an event is retarded.

**delay line**

- (1) (ISO) A line or network designed to introduce a desired *delay* in the *transmission* of a *signal*, usually without appreciable distortion.
- (2) A *sequential logic element* with one *input channel* and in which an *output channel* state at any one instant, T, is the same as the input channel state at the instant T-N, where N is a constant interval of time for a given output channel, i.e., an element in which the input sequence undergoes a *delay* of N time *units*.
- (3) See *acoustic delay line*, *electromagnetic delay line*, *magnetic delay line*.

**delay line storage**

(ISO) A *storage device* that uses *delay lines*.

**delay unit**

(ISO) A device that yields, after a given time interval, an *output signal* essentially similar to a previously introduced *input signal*.

**deleave**

Synonym for *decollate*.

**delete character (DEL)**

(ISO) A *control character* used primarily to obliterate an erroneous or unwanted *character*; on *perforated tape* this character consists of a *code hole* in each *punch position*.

**delimiter**

A *flag* that separates and organizes *items* of *data*. Synonymous with *punctuation symbol*, *separator*.

**denary**

(ISO) Synonym for *decimal*(2).

**density**

See *packing density*, *recording density*.

**descriptor**

In *information retrieval*, a *word* used to categorize or *index information*. Synonymous with *keyword*.

**designation hole**

(ISO) A hole *punched* in a *punch card* to indicate the nature of the *data* on the card or the functions that a machine is to perform. Synonymous with *control hole*, *function hole*.

**destructive read**

(ISO) A *reading* that also *erases* the *data* in the source *location*.

**detail file**

(ISO) Synonym for *transaction file*.

**development time**

- (1) That part of *operating time* used for *debugging* new *routines* or *hardware*.
- (2) Contrast with *makeup time*.
- (3) See *program development time*.

**device control character**

(ISO) A *control character* used for the control of ancillary devices associated with a *data processing system* or a *data communication system*, e.g., for *switching* such devices on or off.

**diagnostic**

Pertaining to the detection and isolation of a *malfunction* or *mistake*.

**diagnostic program**

(ISO) A *computer program* that recognizes, locates, and explains either a *fault*



in equipment or a *mistake* in a computer program.

### diagram

See *block diagram*, *functional diagram*, *logic diagram*, *setup diagram*, *Veitch diagram*, *Venn diagram*.

### dichotomizing search

(ISO) A *search* in which an ordered set of *items* is partitioned into two parts, one of which is rejected, the *process* being repeated on the accepted part until the search is completed.

### dictionary

- (1) Synonym for *table*.
- (2) See *relocation dictionary*.

### difference

(ISO) In a subtraction *operation*, the number or quantity that is the *result* of subtracting the *subtrahend* from the *minuend*.

### differential analyzer

- (1) (ISO) An *analog computer* using interconnected *integrators* to solve differential equations.
- (2) See *digital differential analyzer*.

### differential gear

In *analog computers*, a mechanism that relates the angles of rotation of three shafts, usually designed so that the algebraic sum of the rotation of two shafts is equal to twice the rotation of the third. A differential gear can be used for addition or subtraction.

### differentiator

A device whose *output function* is proportional to the derivative of the *input function* with respect to one or more *variables*, e.g., a resistance-capacitance net-

work used to select the leading and trailing edges of a *pulse signal*.

### digit

- (1) (ISO) A *graphic character* that represents an *integer*, e.g., one of the characters 0 to 9.
- (2) A *symbol* that represents one of the nonnegative *integers* smaller than the *radix*. For example, in *decimal notation*, a digit is one of the characters from 0 to 9.
- (3) (ISO) Synonymous with numeric character.
- (4) See *binary digit*, *borrow digit*, *carry digit*, *check digit*, *decimal digit*, *equivalent binary-digit factor*, *sign digit*, *significant digit*.

### digital

- (1) (ISO) Pertaining to *digits* or to the representation of *data* or physical quantities by digits.
- (2) Contrast with *analog*.

### digital computer

- (1) (ISO) A *computer* in which *discrete representations* of *data* are mainly used.
- (2) A *computer* that operates on *discrete data* by performing arithmetic and logic processes on these data.
- (3) Contrast with *analog computer*.

### digital data

(ISO) *Data* represented by *digits*, perhaps with *special characters* and the *space character*.

### digital differential analyzer (DDA)

- (1) (ISO) An *incremental computer* in which the principal type of computing *unit* is a *digital integrator* whose *operation* is similar to the operation of an integrating mechanism.
- (2) A *differential analyzer* that uses *digital*

representations for the *analog* quantities.

### digital representation

(ISO) A *discrete representation* of a *quantized* value of a *variable*, i.e., the representation of a *number* by *digits*, perhaps with *special characters* and the *space character*.

### digitize

(ISO) To express or represent in a *digital* form *data* that are not *discrete data*, e.g., to obtain a *digital representation* of the magnitude of a physical quantity from an *analog representation* of that magnitude.

### digit place

(ISO) In a *positional representation system*, each site that may be occupied by a *character* and that may be identified by an ordinal *number* or by an equivalent *identifier*. Synonymous with *digit position*, *symbol rank*.

### digit position

(ISO) Synonym for *digit place*.

### digit punch

- (1) A *punch* in rows 1, 2, ..., 9 of a *punched card*.
- (2) Contrast with *zone punch*.
- (3) See also *eleven punch*, *twelve punch*.

### diminished radix complement

(ISO) A *complement* obtained by subtracting each *digit* of the given *number* from the number that is one less than the *radix* of that *digit place*. Synonymous with *radix-minus-one complement*.

### dipole modulation

Synonym for *non-polarized return-to-zero recording*.

### direct access

- (1) (ISO) The facility to obtain *data* from *storage devices* or to enter data into a storage device in such a way that the *process* depends only on the location of that data and not on a reference to data previously accessed.
- (2) Contrast with *serial access*.

### direct access storage

(ISO) A *storage device* in which the *access time* is in effect independent of the *location* of the *data*. Synonymous with *immediate access storage*.

### direct address

- (1) (ISO) An *address* that designates the *storage location* of an *item* of *data* to be treated as an *operand*. Synonymous with *one-level address*.
- (2) Contrast with *indirect address*.

### direct addressing

- (1) (ISO) A method of *addressing* in which the *address part* of an *instruction* contains a *direct address*.
- (2) Contrast with *indirect addressing*.

### direct insert subroutine

(ISO) Synonym for *open subroutine*.

### direct instruction

(ISO) An *instruction* that contains the *direct address* of an *operand* for the *operation* specified.

### directive

(ISO) Synonym for *declaration*.

### directory

(ISO) A *table* of *identifiers* and references to the corresponding *items* of *data*.

### disaster dump

A *dump* made when a nonrecoverable *computer program error* occurs.

**disc**

Alternate spelling for *disk*.

**discrete**

(1) (ISO) Pertaining to distinct *elements* or to representation of *data* by distinct elements such as *characters*, or to physical quantities only having distinct values.

(2) Contrast with *analog*.

**discrete data**

(ISO) *Data* represented by *characters*.

**discrete programming**

(ISO) Synonym for *integer programming*.

**discrete representation**

(ISO) A representation of *data* by *characters*, each character or a group of characters designating one of a number of alternatives.

**discrimination instruction**

(ISO) An *instruction* of the class of instructions that comprises *branch instructions* and *conditional jump instructions*.

**disjunction**

(1) (ISO) The *boolean operation* whose result has the boolean value 0 if and only if each *operand* has the boolean value 0. Synonymous with inclusive-OR operation, logical add, OR operation.

(2) Contrast with *nondisjunction*.

**disk**

(ISO) Synonym for *magnetic disk*.

**disk pack**

(1) (ISO) A removable assembly of *magnetic disks*.

(2) A portable set of flat, circular recording surfaces used in a *disk storage device*.

**display**

(1) (ISO) A visual presentation of *data*.

(2) (ISO) Loosely, a *display device*.

(3) See *cathode ray tube display*.

**display device**

(1) (ISO) An *output unit* that gives a visual representation of *data*. Usually the data are *displayed* temporarily, however, arrangements may be made for making a permanent *record*.

(2) See *character display device*.

**display tube**

A tube, usually a cathode ray tube, used to *display data*.

**dividend**

(ISO) In a division operation, the *number* or quantity to be divided.

**divisor**

(ISO) In a division operation, the *number* or quantity by which the *dividend* is divided.

**DLE**

The *data link escape character*.

**document**

(ISO) A *data medium* and the *data* recorded on it, that generally has permanence and that can be *read* by man or machine.

**documentation**

(1) (ISO) The management of *documents* which may include the actions of identifying, acquiring, *processing*, *storing*, and disseminating them.

(2) (ISO) A collection of *documents* on a given subject.

**document mark**

(ISO) In *micrographics*, an optical mark, within the *recording area* and outside the

image on a roll of *microfilm*, used for counting images or *film frames automatically*. Synonymous with *blip*.

**document reference edge**

In *character recognition*, a specified *document edge* with respect to which the alignment of *characters* is defined.

**do-nothing operation**

(ISO) Synonym for *no-operation instruction*.

**dot matrix**

(ISO) In *micrographics*, a method of generating *characters* using a matrix of dots so that the combination of energized dots produces a human-readable character.

**dot printer**

(ISO) Synonym for *matrix printer*.

**double card**

A special card that is approximately twice the length of a *general purpose paper card*. A double card usually consists of two separable general purpose paper cards.

**double-ended queue**

A *list* of variable length, whose content may be changed by adding or removing *items* at either end.

**double-length register**

(ISO) Two *registers* that function as a single register. Each register may be individually accessed. For example, a double-length register may be used in exact multiplication, for storing the *result*; in exact division, for *storing* the partial *quotient* and *remainder*; in *character manipulation*, for *shifting character strings* and accessing the left or right portion. Synonymous with *double register*.

**double precision**

(ISO) Pertaining to the use of two *computer words* to represent a *number* in accordance with the required *precision*.

**double pulse recording**

(ISO) Phase modulation recording magnetized in opposite polarity with unmagnetized regions on each end. A *zero* may be represented by a cell composed of a negative region followed by a positive region, and a *one* by a positive region followed by a negative region, or vice versa.

**double rail logic**

Pertaining to self-timing asynchronous circuits in which each *logic variable* is represented by two electrical lines which together can take on three meaningful states: *zero*, *one*, and *undecided*.

**double register**

(ISO) Synonym for *double-length register*.

**doublet**

(ISO) A *byte* composed of two *binary elements*. Synonymous with *two-bit byte*.

**doubleword**

A contiguous *sequence* of *bits* or *characters* which comprises two *computer words* and is capable of being *addressed* as a *unit*.

**downtime**

The time during which a *functional unit* is inoperable due to a *fault*.

**drive**

See *tape drive*.

**drop in**

(1) (ISO) The *reading* of an additional false *binary character* from *magnetic storage* because of a defect in, or the



presence of particles on the magnetic surface layer.

- (2) The *reading* of a spurious *signal* whose amplitude is greater than a predetermined percentage of the nominal signal.

#### drop out

- (1) (ISO) A failure to *read* a *binary character* from *magnetic storage* because of defects in, or the presence of particles on the magnetic surface layer.
- (2) In *magnetic tape*, a recorded signal whose amplitude is less than a predetermined percentage of a reference signal.
- (3) In *data communication*, a momentary loss in *signal*, usually due to the effect of *noise* or *system malfunction*.
- (4) A failure to *read* a *bit* from *magnetic storage*.

#### drum

See *magnetic drum*.

#### drum printer

A *line printer* in which the type are mounted on a rotating drum that contains a full *character set* for each printing position.

#### drum storage

See *magnetic drum storage*.

#### DTE

*Data terminal equipment*.

#### dual operation

(ISO) Of a *boolean operation*, another boolean operation whose *result*, when it is performed on *operands* that are the *negation* of the operands of the first boolean operation, is the negation of the result of the first boolean operation. For example, *disjunction* is the dual operation of *conjunction*.

#### dummy

Pertaining to the characteristic of having the appearance of a specified thing but not having the capacity to *function* as such. For example, a *dummy character*, *dummy plug*, or a *dummy statement*.

#### dummy instruction

(ISO) An *item* of *data* in the form of an *instruction* that is inserted in a set of instructions, but is not intended to be *executed*.

#### dump

- (1) (ISO) *Data* that have been dumped.
- (2) (ISO) To *write* the contents of a *storage*, or of part of a storage, usually from an *internal storage* to an *external medium*, for a specific purpose such as to allow other use of the storage, as a safeguard against *faults* or *errors*, or in connection with *debugging*.
- (3) See *change dump*, *disaster dump*, *dynamic dump*, *postmortem dump*, *selective dump*, *snapshot dump*, *static dump*.

#### dump routine

(ISO) A *utility routine* that *dumps*.

#### duodecimal

- (1) (ISO) Characterized by a selection, choice, or condition that has twelve possible different values or states.
- (2) (ISO) Of a *fixed-radix numeration system*, having a *radix* of twelve.

#### duplex

- (1) In *data communication*, pertaining to a *simultaneous* two-way independent *transmission* in both directions. Synonymous with *full duplex*.
- (2) Contrast with *half duplex*.



**duplicate**

(ISO) To *copy* from a source to a destination that has the same physical form as the source, e.g., to *punch* new *punched cards* with the same pattern of holes as an original punched card. Synonymous with *reproduce*.

**duplication check**

A *check* based on the consistency of two independent performances of the same task.

**dyadic boolean operation**

(ISO) A *boolean operation* on two and only two *operands*.

**dyadic operation**

(ISO) An *operation* on two and only two *operands*.

**dyadic operator**

(ISO) An *operator* that represents an *operation* on two and only two *operands*. Synonymous with *binary operator*.

**dynamic dump**

(ISO) *Dumping* performed during the execution of a *computer program*, usually under the control of that computer program.

**dynamicizer**

(ISO) Synonym for *serializer*.

**dynamic parameter**

(ISO) Synonym for *program-generated parameter*.

**dynamic programming**

(1) (ISO) In *operations research*, a *procedure* for optimization of a multistage problem solution wherein a number of

decisions are available at each stage of the process.

(2) Contrast with *convex programming*, *integer programming*, *linear programming*, *mathematical programming*, *nonlinear programming*, *quadratic programming*.

**dynamic relocation**

A *process* that assigns new *absolute addresses* to a *program* during *execution* so that it may be executed from a different area of *main storage*.

**dynamic stop**

(ISO) Synonym for *breakpoint halt*.

**dynamic storage**

A device *storing data* in a manner that permits the data to *move* or vary with time such that the specified data are not always available for recovery. *Magnetic drum* and *disk storage* are *dynamic non-volatile storage*. An *acoustic delay line* is *dynamic volatile storage*.

**dynamic storage allocation**

(ISO) A *storage allocation* technique in which the *storage areas* assigned to *computer programs* and to *data* are determined by criteria applied at the moment of need.

**dynamic subroutine**

A *subroutine* in skeletal form with regard to certain features, such as the number of repetitions, *decimal point position*, or *item size*, that are selected or adjusted in accordance with the *data processing* requirements.

## E

**EAM**

*Electrical accounting machine.*

**EBCDIC (Extended binary-coded decimal interchange code)**

A coded character set consisting of 8-bit coded characters.

**EBR**

*Electron beam recording.*

**echo check**

A method of checking the accuracy of transmission of data in which the received data are returned to the sending end for comparison with the original data.

**edge**

See *document reference edge*, *reference edge*, *stroke edge*.

**edge-coated card**

A card that has been strengthened by treating one or more edges.

**edge-notched card**

A card in which notches representing data are punched around the edges. Usually long needles are used to select a specified set.

**edge-punched card**

A card that is punched with hole patterns in tracks along the edges. Usually the hole patterns are in *punch tape code*. Synonymous with *verge-punched card*.

**edit**

(ISO) To prepare data for a later operation. Editing may include the rearrangement or the addition of data, the deletion of unwanted data, *format control*, *code conversion*, and the application of standard processes such as *zero suppression*.

**editing symbols**

In *micrographics*, symbols on microfilm that are readable without magnification and that provide cutting, loading, and other preparation instructions.

**editor**

See *linkage editor*.

**editor program**

- (1) A computer program designed to perform such functions as the rearrangement, modification, and deletion of data in accordance with prescribed rules.
- (2) Contrast with *linkage editor*.

**EDP**

*Electronic data processing.*

**effective address**

- (1) (ISO) The contents of the address part of an effective instruction.
- (2) The address that is derived by applying any specified indexing or indirect addressing rules to the specified address and that is actually used to identify the current operand.

**effective instruction**

(ISO) An instruction that may be executed without modification.

**eight-bit byte**

Synonym for *octet*.

**either-or operation**

(ISO) Deprecated term for *disjunction*.

**electrical accounting machine (EAM)**

Pertaining to data processing equipment that is predominantly electromechanical such as keypunches, mechanical sorters, collators, and tabulators.

**electromagnetic delay line**

A *delay line* whose *operation* is based on the time of propagation of electromagnetic waves through distributed or lumped capacitance and inductance.

**electron beam recording (EBR)**

In *micrographics*, a specific method of *computer output microfilming* in which a beam of electrons is directed onto an energy-sensitive *microfilm*.

**electronic data processing (EDP)**

(ISO) *Data processing* largely performed by electronic devices.

**electrostatic storage**

(ISO) A *storage device* that uses electrically charged areas on a dielectric surface.

**element**

- (1) (ISO) In a *set*, an object, entity, or concept having the properties that define a set. Synonymous with *member*.
- (2) See *AND element*, *binary element*, *combinational logic element*, *exclusive-OR element*, *identity element*, *IF-AND-ONLY-IF element*, *IF-THEN element*, *inclusive-OR element*, *logic element*, *majority element*, *NAND element*, *NOR element*, *NOT element*, *NOT-IF-THEN element*, *sequential logic element*, *threshold element*.

**element string**

See *binary element string*.

**eleven-punch**

A *punch* in the second row from the top, on a *Hollerith card*. Synonymous with *x-punch*.

**EM**

The *end-of-medium character*.

**embossment**

- (1) A distortion of the surface of a *document*.
- (2) In *character recognition*, the distance between the undistorted surface of a *document* and a specified part of a printed *character*.

**emergency maintenance**

*Maintenance* specifically intended to eliminate an existing *fault*, that makes continued production work unachievable.

**emergency maintenance time**

Time, usually unscheduled, used to perform *emergency maintenance*.

**empty medium**

(ISO) A *data medium* that does not contain *data* other than a frame of reference, e.g., a preprinted form, tape punched only with *feed holes*.

**empty set**

(ISO) A *set* that has no *elements*. Synonymous with *null set*.

**emulate**

- (1) To imitate one system with another, primarily by *hardware*, so that the imitating system accepts the same *data*, executes the same *computer programs*, and achieves the same results as the imitated system.
- (2) Contrast with *simulate* (2).

**enabling signal**

A *signal* that permits the occurrence of an event.

**encode**

- (1) (ISO) To *convert data* by the use of a *code* or a *coded character set* in such a manner that reconversion to the original form is possible. Encode

is sometimes loosely used when complete reversion is not possible.

- (2) Synonymous with *code*.
- (3) Contrast with *decode*.

#### encoder

- (1) (ISO) A device that *encodes data*.
- (2) (ISO) A device that has a number of *input* lines of which not more than one may carry a *signal* and a number of *output* lines of which any number may carry signals, there being a one-to-one correspondence between the combinations of output signals and the input signals.
- (3) Contrast with *decoder*.

#### end-around borrow

(ISO) The action of *transferring a borrow digit* from the most significant *digit place* to the least significant digit place.

#### end-around carry

(ISO) The action of *transferring a carry digit* from the most significant *digit place* to the least significant digit place. An end-around carry may be necessary when adding two negative *numbers* that are represented by their *diminished radix complements*.

#### end-around shift

A *shift* in which the *data* moved out of one end of the storing *register* are reentered into the other end. Synonymous with circular shift.

#### end-of-medium character (EM)

(ISO) A *control character* that may be used to identify the physical end of the *data medium*, the end of the used portion of the medium, or the end of the wanted portion of the *data* recorded on the medium.

#### end-of-tape marker (EOT)

A marker on a *magnetic tape* used to indicate the end of the permissible recording area, e.g., a photo reflective strip, a transparent section of tape, a particular *bit* pattern.

#### end-of-text character (ETX)

(ISO) A *transmission control character* used to terminate a *text*.

#### end-of-transmission-block character (ETB)

(ISO) A *transmission control character* used to indicate the end of a *transmission block* of *data* when data are divided into such blocks for *transmission* purposes.

#### end-of-transmission character (EOT)

(ISO) A *transmission control character* used to indicate the conclusion of a *transmission* which may have included one or more *texts* and any associated *message headings*.

#### ENQ

The *enquiry character*.

#### enquiry character (ENQ)

(ISO) A *transmission control character* used as a request for a response from the station with which the connection has been set up, which response may include station identification, the type of equipment in service, and the *status* of the remote station.

#### entrance

(ISO) Synonym for *entry point*.

#### entropy

- (1) (ISO) In *information theory*, the mean value of the *measure of information* conveyed by the occurrence of any one of a finite number of mutually exclusive and jointly exhaustive events of definite probabilities: in mathemati-



cal notation, this mean  $H(x)$  for a set of events  $x_1, \dots, x_n$  with the probabilities  $p(x_1), \dots, p(x_n)$  equals the mathematical expectation, or mean value, of the information content  $I(x_i)$  of the individual events, i.e.,

$$H(x) = \sum_{i=1}^n p(x_i) I(x_i) = \sum_{i=1}^n p(x_i) \log \frac{1}{p(x_i)}$$

Synonymous with average information content, mean information content,

- (2) See *character mean entropy, conditional entropy*.

#### entry

- (ISO) Synonym for *entry point*.

#### entry conditions

- (1) (ISO) The conditions to be specified on entering a *computer program*, a *routine*, or a *subroutine*. For example, the *address* of those *locations* from which the program, routine, or subroutine will take its *operands* and of those locations with which its *entry points* and *exits* will be *linked*.
- (2) The initial *data* and control conditions to be satisfied for successful execution of a given *routine*.

#### entry point

- (1) (ISO) The *address* or the *label* of the first *instruction executed* upon entering a *computer program*, a *routine*, or a *subroutine*. A computer program, a routine, or a subroutine may have a number of different entry points, each perhaps corresponding to a different

function or purpose. Synonymous with entrance, entry.

- (2) In a *routine*, any place to which control can be passed.

#### EOT

- (1) The *end-of-transmission character*.
- (2) *End-of-tape marker*.

#### equipment

See *data terminal equipment, peripheral equipment*.

#### equivalence

A logic operator having the property that if P is a statement, Q is a statement, R is a statement,... then the equivalence of P, Q, R,... is true if and only if all statements are true or all statements are false.

#### equivalence operation

- (1) (ISO) The *dyadic boolean operation* whose *result* has the boolean value 1 if and only if the *operands* have the same boolean value. Synonymous with IF-AND-ONLY-IF operation.
- (2) Contrast with *nonequivalence operation*.

#### equivalent-binary-digit factor

The average number of *binary digits* required to express one *radix digit* in a non-binary *numeration system*. For example, approximately  $3\frac{1}{2}$  times the number of *decimal digits* is required to express a *decimal numeral* as a *binary numeral*.

#### equivocation

(ISO) In *information theory*, the *conditional entropy* of the occurrence of specific *messages* at the *message source* given the occurrence of specific messages at a *message sink* connected to the message source by a specified *channel*. If  $x_i$  is the input message at the message source and  $y_j$  the output message at the message sink, the



equivocation is noted as the conditional entropy  $H(x|y)$ . The equivocation is the mean additional *information content* that must be supplied per message at the message sink to correct the received messages affected by a *noisy* channel.

**erasable storage**

- (1) (ISO) A *storage device* whose contents can be modified.
- (2) Contrast with *fixed storage*, *permanent storage*.

**erase**

(ISO) To remove all previous *data* from *magnetic storage* by changing it to a specified condition; that may be an unmagnetized state or a predetermined magnetized state.

**erase character**

(ISO) Deprecated term for *delete character*.

**error**

- (1) (ISO) A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition.
- (2) (ISO) Deprecated term for *mistake*.
- (3) Contrast with *failure*, *fault*, *malfunction*, *mistake*.
- (4) See *absolute error*, *balanced error*, *bias error*, *inherited error*, *relative error*, *rounding error*, *truncation error*.

**error burst**

In *data communication*, a *sequence* of *signals* containing one or more *errors* but counted only as one *unit* in accordance with some specific criterion or measure. An example of a criterion is that if three consecutive correct *bits* follow an erroneous bit, then an error burst is terminated.

**error control character**

Synonym for *accuracy control character*.

**error correcting code**

A *code* in which each acceptable expression conforms to specific rules of construction that also define one or more equivalent nonacceptable expressions, so that if certain *errors* occur in an acceptable expression the *result* will be one of its equivalents and thus the error can be corrected.

**error detecting code**

A *code* in which each expression conforms to specific rules of construction, so that if certain *errors* occur in an expression the resulting expression will not conform to the rules of construction and thus the presence of the errors is detected. Synonymous with self-checking code.

**error message**

An indication that an *error* has been detected.

**error range**

- (1) (ISO) The *set* of values that an *error* may take.
- (2) (ISO) Deprecated term for *error span*.

**error ratio**

The ratio of the number of *data* units in *error* to the total number of data units.

**error span**

(ISO) The difference between the highest and the lowest *error* values.

**ESC**

The *escape character*.

**escape character (ESC)**

- (1) (ISO) A *code extension character* used, in some cases with one or more succeeding *characters*, to indicate by

some convention or agreement that the *coded representations* following the character or the group of characters are to be interpreted according to a different *code* or according to a different *coded character set*.

- (2) See *data link escape character*.

### ETB

The *end-of-transmission-block character*.

### ETX

The *end-of-text character*.

### event posting

The saving of the *computer program* and the *data context* of a *task* and establishing the program and data of another task to which control is to be passed, based on an event such as completion of *loading* of data into *main storage*.

### except operation

(ISO) Deprecated term for *exclusion*.

### excess-three code

(ISO) The *binary-coded decimal notation* in which a *decimal digit*  $n$  is represented by the *binary numeral* that represents  $(n+3)$ .

### exchange sort

A *sort* in which succeeding pairs of *items* in a *set* are examined; if the items in a pair are out of *sequence* according to the specified criteria, the *positions* of the items are exchanged; e.g., a *bubble sort*. This *process* is repeated until all items are sorted.

### exclusion

(1) (ISO) The *dyadic boolean operation* whose *result* has the boolean value 1 if and only if the first *operand* has the boolean value 1 and the second has the boolean value 0.

(2) A *logic operator* having the property that if  $P$  is a statement and  $Q$  is a statement, then  $P$  exclusion  $Q$  is true if  $P$  is true and  $Q$  is false, false if  $P$  is false, and false if both statements are true.  $P$  exclusion  $Q$  is often represented by a combination of "AND" and "NOT" symbols such as  $P \sim \wedge Q$ .

(3) (ISO) Synonymous with NOT-IF THEN operation.

### exclusive-OR

(1) A *logic operator* having the property that if  $P$  is a statement and  $Q$  is a statement, then  $P$  exclusive-OR  $Q$  is true if either but not both statements are true, false if both are true or both are false.  $P$  exclusive-OR  $Q$  is often represented by  $P \oplus Q$ ,  $P \nabla Q$ .

(2) Contrast with *OR*.

### exclusive-OR element

(ISO) A *logic element* that performs the *boolean nonequivalence operation*. Synonymous with exclusive-OR gate.

### exclusive-OR gate

(ISO) Synonym for *exclusive-OR element*.

### exclusive-OR operation

(ISO) Synonym for *nonequivalence operation*.

### execute

(1) (ISO) In *programming*, to change the state of a *computer* in accordance with the rules of the *operations* it recognizes.

(2) (ISO) To perform the execution of an *instruction* or of a *computer program*.

### execute phase

(ISO) Of a *run*, the logical subdivision that includes the *execution* of the *target*

*program*. Synonymous with *executing phase*.

**executing phase**

(ISO) Synonym for *execute phase*.

**execution**

- (1) (ISO) In *programming*, the process by which a *computer program* or *subroutine* changes the state of a *computer* in accordance with the rules of the *operations* that a computer recognizes.
- (2) (ISO) The *process* of carrying out an *instruction* by a *computer*.
- (3) (ISO) The *process* of carrying out the *instructions* of a *computer program* by a *computer*.

**executive program**

(ISO) Synonym for *supervisory program*.

**executive routine**

(ISO) Synonym for *supervisory routine*.

**exit**

(ISO) Any *instruction* in a *computer program*, in a *routine*, or in a *subroutine* after the *execution* of which control is no longer exercised by that computer program, that routine, or that subroutine.

**explicit address**

(ISO) Synonym for *absolute address*.

**exponent**

(ISO) In a *floating-point representation*, the *numeral* that denotes the power to which the implicit *floating point base* is raised before being multiplied by the *fixed-point part* to determine the *real number* represented, e.g., a floating point representation of the number 0.0001234 is 0.1234-3, where 0.1234 is the fixed-point part and -3 is the exponent.

**expression**

A configuration of signs.

**extended time scale**

- (1) The time scale used in *data processing* when the *time scale factor* is greater than one. Synonymous with *slow time scale*.
- (2) Contrast with *fast time scale*.

**extension character**

See *code extension character*.

**external delays**

Time lost due to circumstances beyond the control of the *operator* or *maintenance engineer*, e.g., *failure* of external power source.

**external program parameter**

(ISO) In a *computer program*, a *parameter* that must be *bound* during the *calling* of the computer program.

**external sort**

- (1) A *sort* that requires the use of *auxiliary storage* because the *set of items* to be sorted cannot be held in the available *internal storage* at one time.
- (2) A *sort program*, or a *sort phase* of a *multipass sort*, that *merges strings* of *items*, using *auxiliary storage*, until one string is formed.

**external storage**

(ISO) In a hierarchy of *storage devices* of a *data processing system*, any storage device that is not *internal storage*. External storage and internal storage are terms which take on precise meanings only with reference to a particular configuration.

**extract**

(ISO) To select and remove from a *set of items* those items that meet some criteria, e.g., to obtain certain specified *digits* from

a *computer word* as controlled by an *instruction* or a *mask*.

**extract instruction**

An *instruction* that requests the formation of a new *expression* from selected parts of given expressions.

## F

**face change character**

(ISO) Synonym for *font change character*.

**factor**

- (1) (ISO) In a multiplication operation, any of the *numbers* or quantities that are the *operands*.
- (2) See *equivalent-binary-digit factor*, *multiplier factor*, *relocation factor*, *scale factor*, *time scale factor*.

**factorial**

(ISO) The *product* of the positive *integers* 1, 2, 3, up to and including a given integer.

**failure**

- (1) (ISO) The termination of the capability of a *functional unit* to perform its required function. A failure is the effect of a *fault*. Synonymous with *malfunction*.
- (2) Contrast with *error*, *fault*, *mistake*.

**false add**

To form a partial sum, i.e., to add without *carries*.

**fast time scale**

- (1) The time scale used in *data processing* when the *time scale factor* is less than one.
- (2) Contrast with *extended time scale*.

**fault**

- (1) (ISO) An accidental condition that causes a *functional unit* to fail to perform in a required manner.
- (2) Contrast with *error*, *failure*, *mistake*.
- (3) See *pattern sensitive fault*, *program sensitive fault*.

## FC

The *font change character*.

## FE

The *format effector character*.

**feedback loop**

The components and *processes* involved in correcting or controlling a system by using part of the *output* as *input*.

**feedback system**

See *information feedback system*.

**feed hole**

(ISO) A hole *punched* in a *data medium* to enable it to be moved or synchronized. Synonymous with *sprocket hole*.

**feed pitch**

(ISO) The distance between corresponding points of adjacent *feed holes* along the *feed track*.

**feed punch**

See *automatic-feed punch*.

**feed track**

The *track* of a tape that contains the *feed holes*.

**ferrite**

An iron compound frequently used in the construction of *magnetic cores*.

**fetch**

To locate and *load* a quantity of *data* from *storage*.

## FF

The *form feed character*.

**Fibonacci number**

An *integer* in the *Fibonacci series*.



**Fibonacci search**

(ISO) A *dichotomizing search* in which the number of *items* in the *set* is equal to a *Fibonacci number* or is assumed to be equal to the next higher Fibonacci number and then at each step in the search the set of items is partitioned in accordance with the *Fibonacci series*. The Fibonacci series is the series 0, 1, 1, 2, 3, 5, 8, ..., each term being the sum of the two preceding terms. It is usually expressed in mathematics as:  $X_i = X_{i-1} + X_{i-2}$  where  $X_0 = 0$  and  $X_1 = 1$ .

**Fibonacci series**

A series of *integers* in which each integer is equal to the *sum* of the two preceding integers in the series. The series is formulated mathematically by  $X_i = X_{i-1} + X_{i-2}$ , where  $X_0 = 0$  and  $X_1 = 1$ , i.e., 0, 1, 1, 2, 3, 5, 8, 13, 21....

**fiche**

See *microfiche*.

**field**

- (1) (ISO) In a *record*, a specified area used for a particular category of *data*, e.g., a group of *card columns* in which a wage rate is *recorded*.
- (2) A group of adjacent *card columns* on a *punch card*.
- (3) See *card field*, *common field*.

**FIFO (first-in-first-out)**

A queuing technique in which the next *item* to be retrieved is the item that has been in the queue for the longest time.

**figurative constant**

- (1) (ISO) A *data name* that is reserved for a specified *constant* in a specified *programming language*.
- (2) (ISO) Deprecated term for *literal*.

**file**

- (1) (ISO) A *set* of related *records* treated as a *unit*, e.g., in stock control, a file could consist of a set of invoices.
- (2) See *inverted file*, *master file*, *transaction file*.

**file gap**

An area on a *data medium* intended to be used to indicate the end of a *file*, and possibly, the start of another. A file gap is frequently used for other purposes, in particular, as a *flag* to indicate the end or beginning of some other group of *data*.

**file layout**

(ISO) The arrangement and structure of *data* or *words* in a *file* including the order and size of the components of the file.

**file maintenance**

(ISO) The activity of keeping a *file* up to date by adding, changing, or deleting *data*.

**file separator character (FS)**

(ISO) The *information separator* intended to identify a logical boundary between *items* called files.

**filler**

(ISO) One or more *characters* adjacent to an *item* of *data* that serve to bring its representation up to a specified size.

**film frame**

- (1) (ISO) In *micrographics*, that area of microfilm exposed during each exposure, whether or not this area is filled by an image.
- (2) Synonymous with recording area.

**film storage**

See *magnetic thin film storage*.

**filter**

A device or *program* that separates *data*, *signals*, or material in accordance with specified criteria.

**five-bit byte**

(ISO) Synonym for *quintet*.

**fixed-cycle operation**

An *operation* that is completed in a specified number of regularly timed *execution cycles*.

**fixed-point part**

(ISO) In a *floating-point representation*, the *numeral* that is multiplied by the *exponentiated implicit floating-point base* to determine the *real number* represented, e.g., a floating-point representation of the number 0.0001234 is 0.1234-3, where .1234 is the fixed-point part and -3 is the exponent. Synonymous with *mantissa*.

**fixed-point representation system**

(ISO) A *radix numeration system* in which the *radix point* is implicitly fixed in the series of *digit places* by some convention upon which agreement has been reached.

**fixed-radix numeration system**

(ISO) A *radix numeration system* in which all the *digit places*, except perhaps the one with the highest *weight*, have the same *radix*. The weights of successive digit places are successive integral powers of a single radix, each multiplied by the same factor. Negative integral powers of the radix are used in the representation of fractions. A fixed-radix numeration system is a particular case of a *mixed-radix numeration system*.

**fixed storage**

(1) A *storage device* whose contents are inherently nonerasable, nonerasable by

a particular user, or nonerasable when operating under particular conditions, e.g., a *storage* when controlled by a lockout feature, a photographic disk. Synonymous with nonerasable storage, permanent storage, read-only memory, read-only storage.

(2) Contrast with *erasable storage*.

**flag**

(1) Any of various types of *indicators* used for identification, e.g., a *word mark*.

(2) A *character* that signals the occurrence of some condition, such as the end of a *word*.

(3) (ISO) Deprecated term for *mark*.

(4) (ISO) Synonym for *switch indicator*.

(5) Synonymous with *sentinel*.

**flash**

See *form flash*.

**flash card**

(ISO) In *micrographics*, a target printed with distinctive markings that is photographed to facilitate the *indexing* of *microfilm*.

**flip-flop**

A *circuit* or device containing active elements, capable of assuming either one of two stable states at a given time. Synonymous with bistable circuit, toggle (1).

**floating-point base**

(ISO) In a *floating-point representation system*, the implicit fixed positive *integer base*, greater than unity, that is raised to the power explicitly denoted by the *exponent* in the floating-point representation or represented by the *characteristic* in the floating-point representation and then multiplied by the *fixed-point part* to determine the *real number* represented, e.g., in the floating-point representation of the

number 0.0001234, namely 0.1234-3, the implicit floating-point base is 10. Synonymous with floating-point radix.

#### floating-point radix

Synonym for *floating-point base*.

#### floating-point register

(ISO) A *register* used to manipulate data in *floating-point representation*.

#### floating-point representation

- (1) (ISO) A representation of a *real number* in a *floating-point representation system*, e.g., a floating-point representation of the number 0.0001234 is 0.1234-3, where 0.1234 is the *fixed-point part* and -3 is the *exponent*. The numerals are expressed in the *variable-point decimal numeration system*.
- (2) Contrast with *variable-point representation*.

#### flow

See *bidirectional flow*, *normal direction flow*, *reverse direction flow*.

#### flow analysis

- (1) In *compilers*, a technique used to determine the specific interdependencies of elements of a *computer program*.
- (2) The detection and recording of the *sequencing of instructions* in *computer programs*, for example as used in *monitors* and *debugging routines*.

#### flowchart

- (1) (ISO) A *graphical representation* of the definition, *analysis*, or method of solution of a problem, in which symbols are used to represent *operations*, *data*, *flow*, *equipment*, etc.
- (2) Contrast with *block diagram*.
- (3) See *data flowchart*, *programming flowchart*.

#### flowchart symbol

(ISO) A *symbol* used to represent *operations*, *data*, *flow*, or *equipment* on a *flowchart*.

#### flowchart text

The descriptive information that is associated with *flowchart symbols*.

#### flow diagram

(ISO) Deprecated term for *flowchart*.

#### flow direction

(ISO) On a *flowchart*, the antecedent to-successor relation between the *symbols*.

#### flowline

(ISO) On a *flowchart*, a line representing a connecting path between *flowchart symbols*, e.g., a line to indicate a *transfer of data* or *control*.

#### fluierics

The area within the field of *fluidics* in which components and *systems* perform *functions* such as sensing, logic, amplification, and control without the use of mechanical parts.

#### fluidic

Pertaining to the sensing, control, *information processing*, and actuation *functions* performed through the use of fluid dynamic phenomena.

#### fluidics

That branch of science and technology concerned with sensing, control, *information processing*, and actuation *functions* performed through the use of fluid dynamic phenomena.

#### flying spot scanner

In *optical character recognition*, a device employing a moving spot of light to scan a sample space, the intensity of the trans-

mitted or reflected light being sensed by a photoelectric transducer.

**fold**

To compact *data* by combining parts of the data, e.g., to *transform* a two-word *alphabetic key* into a one-word *numeric key* by adding the numeric equivalents of the *letters*.

**font**

- (1) A family or assortment of *characters* of a given size and style, e.g., 9 point Bodoni Modern..
- (2) See *type font*.

**font change character (FC)**

(ISO) A *control character* that selects and makes effective a change in the specific shape, or size, or shape and size of the *graphics* for a set of graphemes, the *character set* remaining unchanged. Synonymous with face change character.

**forbidden combination**

- (1) A combination of *bits* or other representations that is not valid according to some criteria.
- (2) Contrast with *illegal character*.

**foreground processing**

- (1) (ISO) The *execution* of a *computer program* that preempts the use of *computer facilities*.
- (2) Contrast with *background processing*.

**formal logic**

(ISO) The study of the structure and form of valid argument without regard to the meaning of the terms in the argument.

**format**

- (1) (ISO) The arrangement or layout of *data* in or on a *data medium*.
- (2) See *address format*, *instruction format*.

**format effector (FE)**

(ISO) Any *control character* used to control the *positioning* of printed, *displayed*, or recorded *data*. Synonymous with layout character.

**form feed character (FF)**

(ISO) A *format effector* that causes the print or *display position* to move to the next predetermined first line on the next form, the next page, or the equivalent.

**form flash**

(ISO) To project a constant pattern such as a report form, grid, or map as background for a *display*. Synonymous with form overlay.

**form overlay**

(ISO) Synonym for *form flash*.

**formula manipulation**

*Algebraic manipulation* of mathematical formulae.

**FORTTRAN (formula translation)**

A *programming language* primarily used to express *computer programs* by arithmetic formulas.

**four-address**

Pertaining to an *instruction format* containing four *address parts*.

**four-bit byte**

(ISO) Synonym for *quartet*.

**four-plus-one address**

Pertaining to an *instruction* that contains four *operand addresses* and the address of the next instruction to be *executed*.

**frame**

- (1) (ISO) That portion of a tape, on a line perpendicular to the *reference*

edge, on which *binary characters* may be written or read simultaneously.

(2) See *film frame*.

## FS

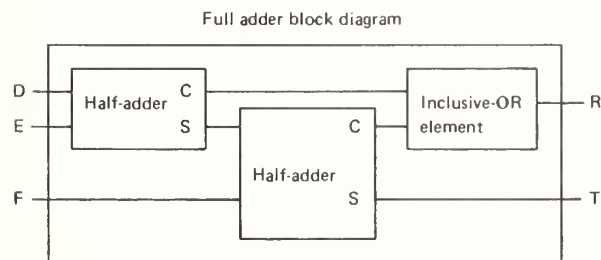
The *file separator character*.

## full adder

(ISO) A *combinational circuit* that has three *inputs* that are an *augend*, D, an *addend*, E, and a *carry digit* transferred from another *digit place*, F; and two *outputs* that are a *sum without carry*, T, and a new *carry digit*, R, and in which the outputs are related to the inputs according to the following table:

Input D augend	0	0	1	1	0	0	1	1
Input E addend	0	1	0	1	0	1	0	1
Input F carry digit	0	0	0	0	1	1	1	1
Output T sum without carry	0	1	1	0	1	0	0	1
Output R carry digit	0	0	0	1	0	1	1	1

Synonymous with three-input adder.



## full duplex

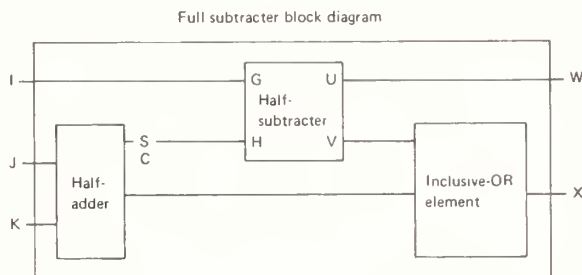
Synonym for *duplex*

## full subtracter

(ISO) A *combinational circuit* that has three *inputs* that are a *minuend*, I, a *subtrahend*, J, and a *borrow digit*, K, transferred from another *digit place*, and two *outputs* that are a *difference*, W, and a new *borrow digit*, X; and in which the outputs are related to the inputs according to the following table:

Input I minuend	0	0	1	1	0	0	1	1
Input J subtrahend	0	1	0	1	0	1	0	1
Input K borrow digit	0	0	0	0	1	1	1	1
Output W difference	0	1	1	0	1	0	0	1
Output X borrow digit	0	1	0	0	1	1	0	1

## Full subtracter block diagram



## fullword

(ISO) Synonym for *computer word*.

## function

(1) (ISO) A mathematical entity whose value, i.e., the value of the dependent *variable*, depends in a specified manner on the values of one or more independent variables, not more than one value of the dependent variable corresponding to each permissible combination of values from the re-



spective *ranges* of the independent variables.

- (2) A specific purpose of an entity, or its characteristic action.
- (3) In *data communication*, a machine action such as *carriage return* or *line feed*.
- (4) In *computer programming*, synonym for *procedure*.
- (5) See *boolean function*, *generating function*, *mathematical function*, *recursive function*, *threshold function*.

**functional design**

(ISO) The specification of the working relationships among the parts of a *data processing system*.

**functional diagram**

A diagram that represents the working relationships among the parts of a *system*.

**functional unit**

(ISO) An entity of *hardware*, *software*, or

both capable of accomplishing a specified purpose.

**function hole**

(ISO) Synonym for *designation hole*.

**function part**

(ISO) Synonym for *operation part*.

**function table**

- (1) Two or more *sets* of *data* so arranged that an entry in one set selects one or more entries in the remaining sets, e.g., a *tabulation* of the values of a *function* for a set of values of the *variable*, a dictionary.
- (2) A device constructed of *hardware*, or a *subroutine*, which can either *decode* multiple *inputs* into a single *output* or *encode* a single input into multiple outputs.

## G

**gang punch**

To punch identical data into a card deck.

**gap character**

(ISO) A character that is included in a computer word for technical reasons but does not represent data.

**gate**

- (1) (ISO) A combinational circuit with only one output channel.
- (2) (ISO) A device having one output channel and one or more input channels, such that the output channel state is completely determined by the input channel states, except during switching transients.
- (3) A combinational logic element having at least one input channel.
- (4) See AND gate, OR gate.

**general purpose computer**

(ISO) A computer that is designed to operate upon a wide variety of problems.

**general-purpose paper card**

A card that meets the specifications in applicable ISO standards, except for the printed card form.

**general-purpose register**

(ISO) A register, usually explicitly addressable within a set of registers, that can be used for different purposes, such as an accumulator, as an index register, as a special handler of data or code formats.

**generate**

To produce a computer program by a selection of subsets from skeletal code under the control of parameters.

**generated address**

(ISO) An address that has been formed as a result during the execution of a computer program. Synonymous with synthetic address.

**generating function**

(ISO) Of a given series of functions or constants, a mathematical function that, when represented by an infinite series, has those functions or constants as coefficients in the series.

**generation**

(ISO) In micrographics, a measure of the remoteness of the copy from the original material, the first microfilm representation being the first generation microfilm.

**generator**

- (1) A controlling routine that performs a generating function, e.g., report generator, I/O generator.
- (2) See compiler generator, macrogenerator.

**global**

- (1) Pertaining to that which is defined in one subdivision of a computer program and used in at least one other subdivision of that computer program.
- (2) Contrast with local.

**graphic**

(ISO) A symbol produced by a process such as handwriting, drawing, or printing. Synonymous with graphic symbol.

**graphic character**

(ISO) A character, other than a control character, that is normally represented by a graphic.

**graphic symbol**

(ISO) Synonym for graphic.

**gray code**

A *binary code* in which *sequential numbers* are represented by *binary expressions*, each of which differs from the preceding expression in one place only. Synonymous with reflected binary code.

**grid**

In *optical character recognition*, two mutually orthogonal sets of parallel lines used for specifying or measuring *character images*.

**group mark**

(ISO) A *mark* that identifies the beginning or the end of a *set* of *data* which may include *blocks*, *words*, or other *items*.

**group separator character (GS)**

(ISO) The *information separator* intended to identify a logical boundary between *items* called groups.

**GS**

The *group separator character*.

**guide edge**

(ISO) Synonym for *reference edge*.

## H

**half adder**

(ISO) A *combinational circuit* that has two *inputs* A and B and two *outputs*, one being a *sum* without *carry*, S, and the other being a *carry*, C, and in which the outputs are related to the inputs according to the following table:

Input A	0	0	1	1
Input B	0	1	0	1
Output S sum without carry	0	1	1	0
Output C carry	0	0	0	1

Synonymous with two-input adder.

**half-duplex**

- (1) In *data communication*, pertaining to an alternating, one way at a time, independent *transmission*.
- (2) Contrast with *duplex*.

**half subtracter**

(ISO) A *combinational circuit* that has two *inputs* that are a *minuend*, G, and a *subtrahend*, H; and two *outputs* that are a *difference*, U, and a *borrow digit*, V, and in which the outputs are related to the inputs according to the following table:

Input G minuend	0	0	1	1
Input H subtrahend	0	1	0	1
Output U difference	0	1	1	0
Output D borrow digit	0	1	0	0

**halfword**

A contiguous *sequence* of *bits* or *characters* which comprises half a *computer word* and is capable of being addressed as a *unit*.

**halt**

See *breakpoint halt*.

**halt instruction**

(ISO) Synonym for *pause instruction*.

**hamming code**

A *data code* which is capable of being corrected *automatically*.

**hamming distance**

Synonym for *signal distance*.

**hand-feed punch**

(ISO) A *keypunch* into which *punch cards* or *punched cards* are manually entered and removed one at a time.

**hardware**

- (1) (ISO) Physical equipment used in *data processing*, as opposed to *computer programs*, *procedures*, *rules*, and associated *documentation*.
- (2) Contrast with *software*.

**hardware check**

Synonym for *automatic check*.

**Hartley**

(ISO) In *information theory*, a unit of logarithmic *measures of information* equal to the *decision content* of a set of ten mutually exclusive events expressed by the logarithm with the base ten, e.g., the decision content of a *character set* of eight *characters* equals 0.903 Hartley. Synonymous with *information content decimal unit*.

**hash total**

The *result* obtained by applying an al-

*gorithm* to a *set* of *data* for checking purposes, e.g., a summation obtained by treating *data items* as *numbers*.

**head**

- (1) A device that *reads*, *writes*, or *erases* *data* on a *storage medium*, e.g., a small electromagnet used to read, write, or erase data on a *magnetic drum* or *magnetic tape*, or the *set* of perforating, reading, or marking devices used for *punching*, reading, or printing on *perforated tape*.
- (2) See *pre-read head*, *read head*, *read/write head*, *write head*.

**header card**

A card that contains *information* related to the *data* in cards that follow.

**heading**

- (1) In *ASCII* and *data communication*, a *sequence* of *characters* preceded by the *start-of-heading character* used as machine sensible *address* or routing *information*.
- (2) Contrast with *text*.

**heading character**

See *start-of-heading character*.

**heuristic method**

(ISO) Any exploratory method of solving problems in which an evaluation is made of the progress toward an acceptable final *result* using a series of approximate results.

**hexadecimal**

(ISO) Synonym for *sexadecimal*.

**high-level language**

(ISO) A *programming language* that does not reflect the structure of any one given *computer* or that of any given class of computers.

**high-speed carry**

- (1) (ISO) In *parallel addition*, any *procedure* for speeding up the processing of *carries*, e.g., *standing-on-nines carry*.
- (2) Contrast with *cascaded carry*.

**hit**

- (1) A *comparison* of two *items* of *data* that satisfies specified conditions. Contrast with *match*.
- (2) A transient disturbance to a communication medium.

**hit-on-the-fly printer**

(ISO) Synonym for *on-the-fly printer*.

**hole pattern**

- (1) (ISO) An *array* of holes that represents *data*. e.g., a *punching* configuration that represents a single *character*.
- (2) A *punching* configuration within a *card column* that represents a single *character* of a *character set*.

**Hollerith**

Pertaining to a particular type of *code* or *punched card* utilizing 12 rows per *column* and usually 80 columns per card.

**Hollerith card**

A *punch card* characterized by 80 *columns* and 12 rows of *punch positions*.

**horizontal feed**

Pertaining to the entry of a *punch card* into a *card feed* with a long edge first.

**horizontal positions**

See *addressable horizontal positions*.

**horizontal tabulation character (HT)**

(ISO) A *format effector character* that causes the print or *display position* to move forward to the next of a series of predetermined positions along the same line.



**housekeeping operation**

(ISO) An *operation* that facilitates the *execution* of a *computer program* without making a direct contribution. For example, initialization of *storage* areas; the execution of a *calling sequence*. Synonymous with overhead operation.

**HT**

The *horizontal tabulation character*.

**hybrid computer**

(ISO) A *computer* using both *analog* and *discrete* representation of *data*.

**hysteresis loop**

See *magnetic hysteresis loop*.

I

**identifier**

(ISO) A *character* or group of characters used to identify or name an *item* of *data* and possibly to indicate certain properties of that data.

**identity element**

(ISO) A *logic element* that performs an *identity operation*. Synonymous with *identity gate*.

**identity gate**

(ISO) Synonym for *identity element*.

**identity operation**

- (1) (ISO) The *boolean operation* the result of which has the *boolean value 1* if and only if all the *operands* have the same *boolean value*. An *identity operation* on two *operands* is an *equivalence operation*.
- (2) Contrast with *nonidentity operation*.

**identity unit**

An *n-input* unit that yields a specified *output signal* only when all *n-input* signals are alike.

**idle character**

See *synchronous idle character*.

**idle time**

- (1) (ISO) *Operable time* during which a *functional unit* is not operated.
- (2) Contrast with *operating time*.

**IDP**

*Integrated data processing*.

**IF-AND-ONLY-IF element**

(ISO) A *logic element* that performs the *boolean operation* of *equivalence*. Synonymous with *IF-AND-ONLY-IF gate*.

**IF-AND-ONLY-IF gate**

(ISO) Synonym for *IF-AND-ONLY-IF element*.

**IF-AND-ONLY-IF operation**

(ISO) Synonym for *equivalence operation*.

**IF-THEN element**

(ISO) A *logic element* that performs the *boolean operation* of *implication*. Synonymous with *IF-THEN gate*.

**IF-THEN gate**

(ISO) Synonym for *IF-THEN element*.

**IF-THEN operation**

(ISO) Synonym for *implication*.

**ignore character**

(ISO) Synonym for *cancel character*.

**illegal character**

- (1) A *character* or combination of *bits* that is not valid according to some criteria, e.g., with respect to a specified *alphabet* a character that is not a member.
- (2) Contrast with *forbidden combination*.

**image**

See *card image*, *cine-oriented image*, *comic-strip-oriented image*.

**image area**

In *micrographics*, that part of the *film frame* reserved for an image.

**image dissector**

In *optical character recognition*, a mechanical or electronic *transducer* that *sequentially* detects the level of light intensity in different areas of a completely illuminated sample space.

**immediate access storage**

A *storage device* whose *access time* is

negligible in comparison with other operating times.

**immediate address**

(ISO) The contents of an *address part* that contains the value of an *operand* rather than an *address*. Synonymous with zero-level address.

**immediate addressing**

(ISO) A method of *addressing* in which the *address part* of an *instruction* contains an *immediate address*.

**immediate instruction**

(ISO) An *instruction* that contains within itself an *operand* for the *operation* specified, rather than an *address* of the operand.

**impact printer**

(ISO) A printer in which printing is the result of mechanical impacts.

**imperative statement**

(ISO) Synonym for *instruction*.

**implication**

(ISO) The *dyadic boolean operation* the result of which has the boolean value 0 if and only if the first *operand* has the boolean value 0 and the second has the boolean value 1. Synonymous with conditional implication operation, IF-THEN operation.

**implied addressing**

(ISO) A method of *addressing* in which the *operation part* of an *instruction* implicitly addresses *operands*.

**imprinter**

Any device used to produce or impress marks or patterns on a surface, e.g., printing presses, typewriters, pens, cash registers, bookkeeping machines, and pressure

devices such as those used with credit cards and address plates.

**imprinting**

- (1) The act of using an *imprinter*.
- (2) The *output* of any *imprinter*.

**impulse**

Synonym for *pulse*.

**incidental time**

(ISO) Synonym for *miscellaneous time*.

**inclusion**

(ISO) Deprecated term for *implication*.

**inclusive-OR element**

(ISO) A *logic element* that performs the *boolean operation* of *disjunction*. Synonymous with inclusive-OR gate.

**inclusive-OR gate**

(ISO) Synonym for *inclusive-OR element*.

**inclusive-OR operation**

(ISO) Synonym for *disjunction*.

**inconnector**

- (1) In *flowcharting*, a connector that indicates a continuation of a broken *flow-line*.
- (2) Contrast with *outconnector*.

**incremental computer**

- (1) (ISO) A *computer* in which *incremental representation* of data is mainly used.
- (2) A *special purpose computer* that is specifically designed to *process* changes in the *variables* as well as the absolute value of the variables.

**incremental integrator**

A *digital integrator* modified so that the *output signal* is maximum negative, zero,

or maximum positive when the value of the *input* is negative, zero, or positive.

#### incremental representation

- (1) (ISO) A method of representing *variables* in which changes in the values of the variables are represented, rather than the values themselves.
- (2) See *ternary incremental representation*.

#### index

- (1) (ISO) In *programming*, a *subscript*, of *integer* value, that identifies the *position* of an *item* of *data* with respect to some other item of data.
- (2) (ISO) A *list* of the contents of a *file* or of a *document*, together with *keys* or references for locating the contents.
- (3) A *symbol* or a *numeral* used to identify a particular quantity in an *array* of similar quantities. For example, the terms of an array represented by X1, X2, ..., X100 have the indexes 1, 2,...,100 respectively.
- (4) In *micrographics*, a guide for locating information on a roll of *microfilm* using targets, flash cards, lines, bars, or other optical *codes*.
- (5) To prepare a *list* as in (2).
- (6) To move a machine part to a predetermined position, or by a predetermined amount, on a *quantized* scale.
- (7) See *code line index*.

#### indexed address

An *address* which is modified by the content of an *index register* prior to or during the *execution* of a *computer instruction*.

#### index register

(ISO) A *register* whose contents may be used to modify an *operand address* during the *execution* of *computer instructions*, so as to operate as a *clock* or *counter*. An index register may be used to control the

execution of a *loop*, to control the use of an *array*, as a *switch*, for *table lookup*, as a pointer, etc. Synonymous with modifier register.

#### index word

(ISO) An *index* modifier applied to the *address part* of a *computer instruction*.

#### indicator

- (1) (ISO) A device that may be set into a prescribed state, usually according to the result of a previous *process* or on the occurrence of a specified condition in the equipment, and that usually gives a visual or other indication of the existence of the prescribed state, and that may in some cases be used to determine the selection among alternative next processes, e.g., an *overflow* indicator.
- (2) An *item* of *data* that may be interrogated to determine whether a particular condition has been satisfied in the *execution* of a *computer program*, e.g., a *switch indicator*, an *overflow* indicator.
- (3) See *switch indicator*.

#### indirect address

- (1) (ISO) An *address* that designates the *storage location* of an *item* of *data* to be treated as the address of an *operand*, but not necessarily as its *direct address*. Synonymous with *multilevel address*.
- (2) Contrast with *direct address*.

#### indirect addressing

- (1) A method of *addressing* in which the *address part* of an *instruction* contains an *indirect address*.
- (2) Contrast with *direct addressing*.

#### indirect instruction

(ISO) An *instruction* that contains the *in-*

*direct address of an operand for the operation specified.*

#### induction

See *mathematical induction*.

#### infinite pad method

In *optical character recognition*, a method of measuring reflectance of a paper stock such that doubling the number of backing sheets of the same stock will not change the measured reflectance.

#### infix notation

- (1) (ISO) A method of forming mathematical expressions, governed by rules of *operator precedence* and using parentheses, in which the operators are dispersed among the *operands*, each operator indicating the *operation* to be performed on the operands or the intermediate *results* adjacent to it. If it is desired to distinguish the case in which there are more than two operands for an operation, the term distributed infix notation may be used.
- (2) Contrast with *parentheses-free notation*, *prefix notation*, *postfix notation*.

#### information

(ISO) The meaning that a human assigns to *data* by means of the known conventions used in their representation.

#### information bits

In *telecommunications*, those *bits* which are generated by the *data source* and which are not used for *error control* by the *data transmission system*.

#### information content

- (1) (ISO) In *information theory*, a *measure of information* conveyed by the occurrence of an event of definite probability; in mathematical notation, the measure  $I(x_i)$  for the event  $x_i$  is

expressed as the logarithm of the reciprocal of the probability  $p(x_i)$  that the particular event will occur: i.e.,

$$I(x_i) = \log \frac{1}{p(x_i)} = -\log p(x_i)$$

- (2) See *conditional information content*, *joint information content*.

#### information content binary unit

(ISO) Synonym for *Shannon*.

#### information content decimal unit

(ISO) Synonym for *Hartley*.

#### information content natural unit (NAT)

(ISO) In *information theory*, a *unit of logarithmic measures of information* expressed by the naperian logarithm, e.g., the *decision content* of a *character set* of eight *characters* equals 2.079 natural units of information.

#### information feedback system

A *data transmission system* that uses an *echo check* to verify the *accuracy* of the transmission.

#### information interchange

The process of sending and receiving *data* in such a manner that the *information content* or meaning assigned to the data is not altered during the *transmission*.

#### information measure

(ISO) In *information theory*, a *suitable function* of the frequency of occurrence of a specified event from a *set* of possible events conventionally taken as a measure of the relative value of the intelligence conveyed by this occurrence. In *information theory*, the term event is to be understood as used in the theory of proba-



bility. For instance, the presence of a given *element* of a set, the occurrence of a specified *character* or of a specified word in a *message*.

#### information processing

(ISO) Synonym for *data processing*.

#### information rate

See *average information rate*.

#### information retrieval

- (1) (ISO) The action of recovering specific *information* from *stored data*.
- (2) (ISO) Methods and *procedures* for recovering specific *information* from *stored data*.

#### information separator (IS)

(ISO) Any *control character* used to delimit like *units* of *data* in a hierarchic arrangement of data. The name of the separator does not necessarily indicate the units of data that it separates. Synonymous with *separating character*.

#### information source

(ISO) Synonym for *message source*.

#### information theory

(ISO) The branch of learning concerned with the study of *measures of information* and their properties.

#### inherited error

An *error* carried forward from a previous step in a *sequential process*.

#### inhibiting signal

A *signal* that prevents the occurrence of an event.

#### initialization

See *loop initialization*.

#### initialize

- (1) To *set counters, switches, addresses, or contents of storage* to *zero* or other starting values at the beginning of, or at prescribed points in, the *operation* of a *computer routine*.
- (2) Contrast with *prestore*.

#### initial program loader (IPL)

- (1) (ISO) The *utility routine* that *loads* the initial part of a *computer program*, such as an *operating system* or other computer program, so that the computer program can then proceed under its own control.
- (2) Contrast with *bootstrap, bootstrap loader*.

#### inline procedures

In *COBOL*, the set of *statements* that constitutes the main or controlling flow of the *computer program* and which excludes statements *executed* under control of the asynchronous control *system*.

#### inoperable time

(ISO) The time during which a *functional unit* would not yield correct results if it were operated. It is assumed that all environmental conditions for proper operation are met.

#### input

- (1) One, or a *sequence* of, *input states*.
- (2) (ISO) Pertaining to a device, *process*, or *channel* involved in an *input process*, or to the *data* or states involved in an input process. In the English *language*, the adjective input may be used in place of input data, input signal, input terminal, etc., when such usage is clear in a given context.
- (3) (ISO) Synonym for *input data, input process*.
- (4) Synonym for *input channel*.
- (5) See *manual input, real time input*.

**input area**

An area of storage reserved for *input*.  
Synonymous with input block.

**input block**

Synonym for *input area*.

**input channel**

A *channel* for impressing a state on a device or *logic element*. Synonymous with input (1).

**input data**

- (1) (ISO) Data being received or to be received into a device or into a *computer program*. Synonymous with input (2).
- (2) Data to be *processed*. Synonymous with input (1).

**input device**

(ISO) Synonym for *input unit*.

**input-output (I/O)**

- (1) (ISO) Pertaining to a device or to a *channel* that may be involved in an *input process* and, at a different time, in an *output process*. In the English language, input-output may be used in place of input-output data, input-output signal, input-output terminals, etc., when such usage is clear in a given context.
- (2) (ISO) Pertaining to a device whose parts can be performing an *input process* and an *output process* at the same time.
- (3) Pertaining to either *input* or *output*, or both.
- (4) (ISO) Synonym for *radial transfer*.

**input-output channel**

(ISO) In an *automatic data processing system*, a *functional unit*, controlled by the *central processing unit*, that handles the

*transfer of data between main storage and peripheral equipment*.

**input-output controller (IOC)**

(ISO) A *functional unit* in an *automatic data processing system* that controls one or more units of *peripheral equipment*. Synonymous with I/O controller, peripheral control unit.

**input-output device**

(ISO) Synonym for *input-output unit*.

**input-output unit**

(ISO) A device in a *data processing system* by which data may be entered into the system, received from the system, or both. Synonymous with input-output device.

**input process**

- (1) (ISO) The *process* that consists of the reception of data into a *data processing system*, into a subsystem, or into a device. Synonymous with input.
- (2) The *process* of *transmitting data* from *peripheral equipment*, or *external storage*, to *internal storage*.
- (3) The *process* of receiving data by a device.

**input program**

(ISO) A *utility program* that organizes the *input process* of a computer.

**input routine**

(ISO) A *utility routine* that organizes the *input process* of a computer.

**input state**

The state occurring on a specified *input channel*.

**input station**

See *data input station*.

**input unit**

(ISO) A device in a *data processing system* by which *data* may be entered into the system. Synonymous with *input device*.

**inquiry station**

(ISO) A *user terminal* primarily for the interrogation of an *automatic data processing system*.

**insertion sort**

A *sort* in which each *item* in a *set* is inserted into its proper position in the sorted set according to the specified criteria.

**installation time**

Time spent in installing and testing *hardware* or *software*.

**instruction**

- (1) (ISO) In a *programming language*, a meaningful *expression* that specifies one *operation* and identifies its *operands*, if any.
- (2) See *absolute instruction*, *arithmetic instruction*, *branch instruction*, *computer instruction*, *conditional jump instruction*, *direct instruction*, *discrimination instruction*, *dummy instruction*, *effective instruction*, *extract instruction*, *immediate instruction*, *indirect instruction*, *jump instruction*, *logic instruction*, *macroinstruction*, *multiaddress instruction*, *n-address instruction*, *no-operation instruction*, *n-plus-one address instruction*, *one-address instruction*, *one-plus-one address instruction*, *optional pause instruction*, *pause instruction*, *presumptive instruction*, *privileged instruction*, *repetition instruction*, *restart instruction*, *stop instruction*, *three-address instruction*, *three-plus-one address instruction*, *two-address instruction*, *two-plus-one address instruction*,

*unconditional-jump instruction*, *zero-address instruction*.

**instruction address**

- (1) (ISO) The *address* of an *instruction word*.
- (2) The *address* that must be used to *fetch an instruction*.
- (3) Contrast with *address part*.

**instruction address register**

(ISO) A *register* from whose contents the *address* of the next *instruction* is derived. An *instruction address register* may also be a portion of a *storage device* specifically designated for the derivation of the *address* of the next *instruction* by a *translator*, *compiler*, *interpreter*, *language processor*, *operating system*, etc. Synonymous with *control counter*, *sequence control register*.

**instruction control unit**

(ISO) In a *central processing unit*, the part that receives *instructions* in proper *sequence*, *interprets* each *instruction*, and applies the proper *signals* to the *arithmetic and logic unit* and other parts in accordance with this interpretation.

**instruction counter**

A *counter* that indicates the *location* of the next *computer instruction* to be interpreted.

**instruction format**

(ISO) The layout of an *instruction* showing its constituent parts.

**instruction modifier**

(ISO) A *word* or a part of a *word* that is used to alter an *instruction*.

**instruction register**

(ISO) A *register* that is used to hold an *instruction* for interpretation.

**instruction repertoire**

- (1) A complete set of the *operators* of the statements of a *computer programming language*, together with a description of the types and meanings that can be attributed to their *operands*.
- (2) Loosely, an *instruction set*.

**instruction set**

(ISO) The set of the *instructions* of a *computer*, of a *programming language*, or of the programming languages in a *programming system*.

**instruction word**

(ISO) A *word* that represents an *instruction*.

**integer**

(ISO) One of the numbers *zero*, *+1*, *-1*, *+2*, *-2*... Synonymous with *integral number*.

**integer programming**

- (1) (ISO) In *operations research*, a class of *procedures* for locating the maximum or minimum of a *function* subject to constraints, where some or all *variables* must have *integer* values. Synonymous with *discrete programming*.
- (2) Contrast with *convex programming*, *dynamic programming*, *linear programming*, *mathematical programming*, *nonlinear programming*, *quadratic programming*.

**integral number**

(ISO) Synonym for *integer*.

**integrated data processing (IDP)**

(ISO) *Data processing* in which the coordination of *data acquisition* and other stages of *data processing* are combined in a coherent *data processing system*.

**integrating motor**

A motor designed to give a constant ratio of *output* shaft rotational speed to *input* signal. Thus the angle of rotation of the shaft with respect to a datum is proportional to the time integral of the applied signal.

**integrator**

- (1) A device whose *output function* is proportional to the integral of the *input* function with respect to a specified *variable*, e.g., a watt-hour meter.
- (2) See *incremental integrator*.

**interblock gap**

- (1) (ISO) A space between *blocks* on *magnetic tape*.
- (2) An area on a *data medium* used to indicate the end of a *block* or *physical record*.
- (3) Synonymous with *block gap*.

**interface**

A shared boundary. An interface might be a *hardware* component to link two devices or it might be a portion of *storage* or *registers* accessed by two or more *computer programs*.

**interleave**

To arrange parts of one *sequence* of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity.

**internal sort**

- (1) A *sort* performed within *internal storage*.
- (2) A *sort program* or a *sort phase* that sorts two or more *items* within *main storage*.

**internal storage**

(ISO) A *storage device* directly controlled



by the *central processing unit* of a *digital computer*.

### interpret

(ISO) To *translate* and to *execute* each *source language statement* of a *computer program* before translating and executing the next statement.

### interpreter

(1) (ISO) A *computer program* used to *interpret*. Synonymous with *interpretive program*.

(2) (ISO) In *punched card* operations, a device that prints on a punched card the *characters* equivalent to the *hole patterns* punched in the card.

### interpretive code

The *instruction repertoire* for the *source language input* to an *interpreter*.

### interpretive program

(ISO) Synonym for *interpreter* (1).

### interrecord gap

(ISO) Deprecated term for *interblock gap*.

### interrupt

To stop a *process* in such a way that it can be resumed.

### interruption

A suspension of a *process*, such as the *execution* of a *computer program*, normally caused by an event external to that process, and performed in such a way that it can be resumed.

### intersection

(ISO) Synonym for *conjunction*.

### interstage punching

A mode of card punching such that the odd or even numbered *card columns* are used.

### inversion

(ISO) Deprecated term for *negation*.

### invert

To change a physical or logical state to its opposite.

### inverted file

(1) A *file* whose *sequence* has been reversed.

(2) In *information retrieval*, a method of organizing a cross-index *file* in which a keyword identifies a *record*; the *items*, numbers, or *documents* pertinent to that keyword are indicated.

### I/O

*Input-output*.

### IOC

*Input-output controller*.

### I/O controller

(ISO) Synonym for *input-output controller*.

### IPL

*Initial program loader*.

### irrational number

(ISO) A *real number* that is not a *rational number*.

### irrelevance

(ISO) In *information theory*, the *conditional entropy* of the occurrence of specific messages at a *message sink* given the occurrences of specific messages at the *message source* connected to the message sink by a specified *channel*. If  $x_i$  is the input message at the message source and  $y_j$  the output message at the message sink, the irrelevance  $H(y|x)$  is expressed by the formula:



$$H(y \mid x) = \sum_{j=1}^{i=n} \sum_{j=1}^{j=m} p(y_j, x_i) \log \frac{1}{p(y_j \mid x_i)}$$

Synonymous with prevarication, spread.

## IS

The *information separator character*.

## ISO

International Organization for Standardization.

## item

- (1) (ISO) One member of a group. A *file* may consist of a number of items such as *records* which in turn may consist of other items.
- (2) A collection of related *characters* treated as a *unit*.

## J

**JCL**

*Job control language.*

**job**

A set of *data* that completely defines a unit of work for a *computer*. A job usually includes all necessary *computer programs*, *linkages*, *files*, and *instructions* to the *operating system*.

**job control language (JCL)**

A *problem-oriented language* designed to express *statements* in a *job* that are used to identify the job or describe its requirements to an *operating system*.

**job control statement**

A *statement* in a *job* that is used to identifying the job or describing its requirements to the *operating system*.

**job step**

The *execution* of a *computer program* explicitly identified by a *job control statement*. A *job* may specify that several job steps be executed.

**joint information content**

(ISO) In *information theory*, a *measure of information* conveyed by the occurrence of two events of definite joint probability; in mathematical notation, this measure  $I(x_i, y_j)$  for two particular events  $x_i, y_j$  from the sets  $x_1 \dots x_n$  and  $y_1 \dots y_m$  equals the logarithm of the reciprocal of the joint probability  $p(x_i, y_j)$  of the occurrence of both events:

$$I(x_i, y_j) = \log \frac{1}{p(x_i, y_j)}$$

**jump**

- (1) (ISO) In the *execution* of a *computer program*, a departure from the implicit or declared *order* in which *instructions* are being executed.
- (2) See *conditional jump*, *unconditional jump*.

**jump instruction**

- (1) (ISO) An *instruction* that specifies a *jump*.
- (2) See *conditional jump instruction*, *unconditional jump instruction*.

**justify**

- (1) (ISO) To control the printing *positions* of *characters* on a page so that both the left-hand and right-hand margins of the printing are regular.
- (2) (ISO) To *shift* the contents of a *register*, if necessary, so that the *character* at a specified end of the *data* that has been *read* or *loaded* into the register is at a specified *position* in the register.
- (3) To align *characters* horizontally or vertically to fit the *positioning* constraints of a required *format*.
- (4) See *left-justify*, *right-justify*.

## K

## k

An abbreviation for the prefix kilo, i.e., 1000 in *decimal notation*.

## K

When referring to *storage capacity*, two to the tenth power, 1024 in *decimal notation*.

## Karnaugh map

(ISO) A rectangular diagram of a logic function of variables drawn with overlapping rectangles representing a unique combination of the logic variables and such that an intersection is shown for all combinations.

## key

- (1) (ISO) One or more *characters*, within a set of *data*, that contains *information* about the set, including its identification.
- (2) See *actual key*, *search key*, *sort key*.

## keyboard punch

(ISO) Synonym for *keypunch*.

## keypunch

(ISO) A keyboard-actuated device that punches holes in a *punch card* or *punched card*. Synonymous with *keyboard punch*.

## key transformation

A function that maps a set of keys into a set of integers, which can be handled arithmetically to determine the location of the corresponding *data elements*.

## keyword

- (1) One of the predefined words of an *artificial language*.
- (2) (ISO) Deprecated term for *reserved word*.
- (3) Synonym for *descriptor*.

## L

**label**

- (1) (ISO) One or more *characters*, within or attached to a *set of data*, that contains *information* about the set, including its identification.
- (2) (ISO) In *computer programming*, an *identifier* of an *instruction*.

**laced card**

A card *punched* accidentally or intentionally with holes in excess of the *hole patterns* of the *character set* used.

**lag**

The *delay* between two events.

**language**

- (1) (ISO) A *set of characters*, conventions, and rules, that is used for conveying *information*. The three aspects of language are *pragmatics*, *semantics*, and *syntax*.
- (2) See *algebraic language*, *algorithmic language*, *application-oriented language*, *artificial language*, *assembly language*, *command language*, *computer language*, *computer-oriented language*, *high-level language*, *job control language*, *linear language*, *machine language*, *multidimensional language*, *natural language*, *object language*, *one-dimensional language*, *problem-oriented language*, *procedure-oriented language*, *programming language*, *source language*, *stratified language*, *syntax language*, *target language*, *unstratified language*.

**language processor**

(ISO) A *computer program* that performs such *functions* as *translating* and *interpreting* and other tasks required for *processing* a specified *programming language*.

**latency**

(ISO) The time interval between the instant at which an *instruction control unit* initiates a call for *data* and the instant at which the actual *transfer* of the data is started. Synonymous with *waiting time*.

**layout character**

(ISO) Synonym for *format effector*.

**leader**

The blank section of tape at the beginning of a *reel* of tape.

**leading decision**

- (1) A *loop control* that is executed before the *loop body*.
- (2) Contrast with *trailing decision*.

**leading end**

The end of a *perforated tape* that first enters a *perforated-tape reader*.

**leading zero**

In *positional notation*, a zero in a more significant *digit place* than the digit place of the most significant nonzero *digit* of a *numeral*.

**leapfrog test**

A *check routine* that *copies* itself through *storage*.

**left-justify**

- (1) (ISO) To *shift* the contents of a *register*, if necessary, so that the *character* at the left-hand end of the *data* that has been *read* or *loaded* into the register is at a specified *position* in the register.
- (2) (ISO) To control the printing *positions* of *characters* on a page so that the left-hand margin of the printing is regular.

**letter**

(ISO) A *graphic character* that, when used alone or combined with others, represents, in a written *language*, one or more sound elements of a spoken language, but excluding diacritical marks used alone and punctuation marks.

**level**

(ISO) The degree of subordination of an *item* in an hierarchic arrangement.

**level number**

(ISO) A reference number that indicates the *position* of an *item* in a hierarchic arrangement. Synonymous with rank.

**LF**

The *line feed character*.

**library**

- (1) A collection of related *files*. For example, one line of an invoice may form an *item*, a complete invoice may form a file, the collection of inventory control files may form a library, and the libraries used by an organization are known as its *data bank*.
- (2) A repository for dismountable recorded media, such as *magnetic disk packs* and *magnetic tapes*.
- (3) See *data library*, *program library*.

**library program**

(ISO) A *computer program* in or from a *program library*.

**library routine**

A proven *routine* that is maintained in a *program library*.

**LIFO (last-in-first-out)**

A queuing technique in which the next *item* to be retrieved is the item most recently placed in the queue.

**light stability**

In *optical character recognition*, the resistance to change of the *color* of the image when exposed to radiant energy.

**line**

See *acoustic delay line*, *character spacing reference line*, *delay line*, *electromagnetic delay line*, *flowline*, *magnetic delay line*, *offline*, *online*, *X-datum line*, *Y-datum line*.

**linear language**

A *language* that is customarily expressed as a *linear representation*. For example, *FORTRAN* is a linear language; a *flowchart* is not.

**linear optimization**

(ISO) Synonym for *linear programming*.

**linear programming (LP)**

- (1) (ISO) In *operations research*, a procedure for locating the maximum or minimum of a *linear function* of *variables* that are subject to linear constraints. Synonymous with linear optimization.
- (2) Contrast with *convex programming*, *dynamic programming*, *integer programming*, *mathematical programming*, *nonlinear programming*, *quadratic programming*.

**linear representation**

An arrangement of *graphics* in a one-dimensional space.

**line-at-a-time printer**

(ISO) Synonym for *line printer*.

**line character**

See *new-line character*.

**line feed character (LF)**

(ISO) A *format effector* that causes the



print or *display position* to move to the corresponding position on the next line.

**line index**

See *code line index*.

**line printer**

- (1) (ISO) A device that prints a line of *characters* as a unit. Synonymous with *line-at-a-time printer*.
- (2) Contrast with *character printer*, *page printer*.

**link**

- (1) (ISO) In *computer programming*, the part of a computer program, in some cases a single *instruction* or an *address*, that passes control and *parameters* between separate portions of the computer program.
- (2) (ISO) In *computer programming*, to provide a link.
- (3) (ISO) Synonymous with *linkage*.
- (4) See *data link*.

**linkage**

(ISO) Synonym for *link* (1).

**linkage editor**

- (1) A *utility routine* that creates a *loadable computer program* by combining independently *translated* computer program *modules* and by resolving cross references among the modules.
- (2) Contrast with *editor program*.

**list**

- (1) (ISO) An *ordered set of items of data*.
- (2) To print or otherwise *display items of data* that meet specified criteria.
- (3) (ISO) Deprecated term for *chained list*.
- (4) See *chained list*, *pushdown list*, *push-up list*.

**list processing**

(ISO) A method of *processing data* in the form of *lists*. Usually, *chained lists* are used so that the logical order of *items* can be changed without altering their physical locations.

**literal**

(ISO) In a *source program*, an explicit representation of the value of an *item*, which value must be unaltered during any *translation* of the source program, e.g., the word FAIL in the *instruction* "IF X = 0 PRINT FAIL."

**load**

(ISO) In *computer programming*, to enter *data* into *storage* or *working registers*.

**load-and-go**

An *operating technique* in which there are no stops between the *loading* and *execution* phases of a *computer program*, and which may include *assembling* or *compiling*.

**loaded origin**

The *address* of the initial *storage location* of a *computer program* in *main storage* at the time the computer program is loaded.

**loader**

- (1) A *routine*, commonly a *computer program*, that *reads data* into *main storage*.
- (2) See *absolute loader*, *bootstrap loader*, *initial program loader*, *relocating loader*.

**load mode**

- (1) In some variable-word-length *computers*, *data transmission* such that certain *delimiters* are moved with the data.
- (2) Contrast with *move mode*.

**local**

- (1) Pertaining to that which is defined and used only in one subdivision of a *computer program*.
- (2) Contrast with *global*.

**location**

- (1) Any place in which *data* may be stored.
- (2) See *protected location*, *storage location*.

**locking**

- (1) (ISO) Of *code extension characters*, having the characteristic that change in interpretation applies to all *coded representations* following, or to all coded representations of a given class, until the next appropriate code extension character occurs.
- (2) Contrast with *nonlocking*.

**logger**

- (1) (ISO) A *functional unit* that records events and physical conditions, usually with respect to time.
- (2) A device that enables a user entity to log in, e.g., to identify itself, its purpose and the time of entry; and to log out with the corresponding *data* so that the appropriate accounting procedures may be carried out in accordance with the *operating system*.

**logging**

See *data logging*.

**logic**

See *double rail logic*, *formal logic*, *symbolic logic*.

**logical add**

(ISO) Synonym for *disjunction*.

**logical comparison**

(ISO) A *logic operation* to determine whether two *strings* are identical.

**logical multiply**

(ISO) Synonym for *AND*.

**logical operation**

(ISO) Synonym for *logic operation*.

**logical product**

(ISO) Deprecated term for *conjunction*.

**logical record**

A *record* independent of its physical environment. Portions of the same logical record may be located in different physical records, or several logical records or parts of logical records may be located in one physical record.

**logical shift**

(ISO) A *shift* that equally affects all of the *characters* of a *computer word*.  
Synonymous with *logic shift*.

**logical sum**

(ISO) Deprecated term for *disjunction*.

**logic design**

A *functional design* that uses formal methods of description, such as *symbolic logic*.

**logic device**

A device that performs *logic operations*.

**logic diagram**

A *graphic* representation of a *logic design*.

**logic element**

- (1) A device that performs an elementary *logic function*.
- (2) See *combinational logic element*, *sequential logic element*.

**logic function**

(ISO) Deprecated term for *switching function*.

**logic instruction**

(ISO) An *instruction* in which the *operation* part specifies a *logic operation*.

**logic operation**

- (1) (ISO) An *operation* that follows the rules of *symbolic logic*.
- (2) (ISO) An *operation* in which each *character* of the *result* depends on not more than one character of each *operand*.
- (3) Synonymous with *logical operation*.

**logic shift**

(ISO) Synonym for *logical shift*.

**logic symbol**

A *symbol* that represents an *operator*, a *function* or a functional relationship.

**logic unit**

- (1) (ISO) A part of a *computer* that performs *logic operations*, and related *operations*.
- (2) See *arithmetic and logic unit*.

**logic variable**

(ISO) Deprecated term for *switching variable*.

**longitudinal redundancy check character**

(LRC)

On a *magnetic tape* where each *character* is represented in a lateral row of *bits*, a character used for *checking* the *parity* of each *track* in the longitudinal direction. Such a character is usually the last character recorded in each *block* and is used in some *magnetic recording systems* to reestablish the initial recording status.

**loop**

- (1) (ISO) A *set* of *instructions* that may be *executed* repeatedly while a certain condition prevails. In some implementations, no test is made to discover whether the condition prevails until the loop has been executed once.
- (2) See *closed loop*, *feedback loop*, *magnetic hysteresis loop*.

**loop body**

- (1) The part of a *loop* that accomplishes its primary purpose.
- (2) In a *counter*, a part of the *loop control*.
- (3) Contrast with *loop control*.

**loop control**

- (1) The parts of a *loop* that modify the *loop control variables* and determine whether to execute the *loop body* or exit from the loop.
- (2) Contrast with *loop body*.

**loop-control variable**

A *variable* that affects the *execution* of *instructions* in the *loop body* and is modified by a *loop control*.

**loop initialization**

The parts of a *loop* that *set* its starting values.

**lower curtate**

The adjacent *card rows* at the bottom of a *punch card*.

**LP**

*Linear programming*.

**LRC**

The *longitudinal redundancy check character*.

**Lukasiewicz notation**

(ISO) Synonym for *prefix notation*.

## M

**machine**

See *accounting machine, electrical accounting machine, turing machine, universal turing machine.*

**machine address**

(ISO) Synonym for *absolute address (1).*

**machine code**

(ISO) Synonym for *computer instruction code.*

**machine instruction**

(ISO) Synonym for *computer instruction.*

**machine instruction set**

Synonym for *computer instruction set.*

**machine language**

- (1) A *language* that is used directly by a machine.
- (2) (ISO) Deprecated term for *computer instruction code.*
- (3) (ISO) Synonym for *computer language.*

**machine learning**

(ISO) The ability of a device to improve its performance based on its past performance.

**machine operation**

Synonym for *computer operation.*

**machine-oriented language**

Synonym for *computer-oriented language.*

**machine-readable medium**

A medium that can convey *data* to a given sensing device. Synonymous with *automated data medium.*

**machine word**

(ISO) Synonym for *computer word.*

**macro declaration**

(ISO) Synonym for *macro definition.*

**macro definition**

(ISO) A *declaration* that provides the *skeletal code* which a *macrogenerator* uses in replacing a *macroinstruction*. Synonymous with *macro declaration.*

**macro generating program**

(ISO) Synonym for *macrogenerator.*

**macrogenerator**

(ISO) A *computer program* that replaces *macroinstructions* in the *source language* with the defined *sequence of instructions* in the *source language*. Synonymous with *macro generating program.*

**macroinstruction**

(ISO) An *instruction* in a *source language* that is to be replaced by a defined *sequence of instructions* in the same *source language*. The *macroinstruction* may also specify values for *parameters* in the *instructions* that are to replace it.

**macroprogramming**

*Computer programming* with *macroinstructions.*

**magnetic card**

A card with a magnetic surface on which *data* can be stored by *magnetic recording.*

**magnetic card storage**

(ISO) A magnetic storage in which *data* are stored by selective polarization of portions of the magnetic material on the surface of thin flexible cards.

**magnetic cell**

(ISO) A *storage cell* in which different

patterns of magnetization are used to represent *characters*. Synonymous with static magnetic cell.

**magnetic core**

- (1) (ISO) A piece of magnetic material, usually toroidal in shape, used for *storage*.
- (2) A configuration of magnetic material that is, or is intended to be, placed in a spatial relationship to current-carrying conductors and whose magnetic properties are essential to its use. It may be used to concentrate an induced magnetic field as in a transformer induction coil, or armature, to retain a magnetic polarization for the purpose of *storing data*, or for its nonlinear properties as in a *logic element*. It may be made of such material as iron, iron oxide, or ferrite and in such shapes as wires, tapes, toroids, rods, or thin film.

**magnetic core storage**

(ISO) A *magnetic storage* in which *data* are *stored* by the selective polarization of *magnetic cores*.

**magnetic delay line**

A *delay line* whose operation is based on the time of propagation of magnetic waves.

**magnetic disk**

(ISO) A flat circular plate with a magnetic surface layer. Synonymous with disk.

**magnetic disk storage**

(ISO) A *magnetic storage* in which *data* are *stored* by the selective polarization of portions of magnetic material on the flat surface of one or more disks that rotate in use.

**magnetic drum**

(ISO) A right circular cylinder with a magnetic surface layer.

**magnetic drum storage**

(ISO) A *magnetic storage* in which *data* are *stored* by the selective polarization of portions of magnetic material of the curved surface of a cylinder that rotates in use.

**magnetic head**

(ISO) An electromagnet that can *read*, *read or write*, *write*, or *erase data* on a magnetic *data medium*.

**magnetic hysteresis loop**

A closed curve showing the relation between the magnetization force and the induction of magnetization in a magnetic substance when the magnetized field (force) is carried through a complete cycle.

**magnetic ink**

An ink that contains particles of a magnetic substance whose presence can be detected by magnetic sensors.

**magnetic ink character recognition (MICR)**

- (1) *Character recognition* of *characters* printed with ink that contains particles of a magnetic material.
- (2) Contrast with *optical character recognition*.

**magnetic recording**

(ISO) A technique of *storing data* by selectively magnetizing portions of a magnetizable material.

**magnetic storage**

A *storage device* that utilizes the magnetic properties of certain materials.



**magnetic tape**

- (1) (ISO) A tape with a magnetic surface layer.
- (2) A tape of magnetic material used as the constituent in some forms of *magnetic cores*.

**magnetic tape storage**

A *magnetic storage* in which *data* are stored by the selective polarization of portions of magnetic material on the surface of a tape that moves longitudinally in use.

**magnetic tape unit**

(ISO) A device containing a *tape drive*, together with *read heads*, *write heads* and associated controls.

**magnetic thin film**

A layer of magnetic material, usually less than one micron thick, often used for *logic elements* or *storage elements*.

**magnetic thin film storage**

(ISO) A *magnetic storage* in which the *data* are stored by the selective polarization of portions of a magnetic film of molecular thickness, coated on a substrate.

**magnetic track**

(ISO) A track on the surface layer of a *magnetic storage*.

**magnetic wire storage**

(ISO) A *magnetic storage* in which *data* are stored by selective magnetization of portions of a wire.

**main control unit**

(ISO) In a *computer* with more than one *instruction control unit*, that instruction control unit to which, for a given interval of time, the other instruction control units are subordinated. An instruction control unit may be designated as the main control unit by *hardware* or by hardware and

*software*. A main control unit at one time may be a subordinate unit at another time.

**main file**

(ISO) Synonym for *master file*.

**main frame**

Synonym for *central processing unit*.

**main storage**

(ISO) A *storage device* whose *storage cells* can be addressed by a *computer program* and from which *instructions* and *data* can be loaded directly into *registers* from which the instructions can be executed or from which the data can be operated upon.

**maintainability**

(ISO) The ease with which *maintenance* of a *functional unit* can be performed in accordance with prescribed requirements.

**maintenance**

- (1) (ISO) Any activity, such as tests, measurements, replacements, adjustments, and repairs, intended to eliminate *faults* or to keep a *functional unit* in a specified state.
- (2) See *corrective maintenance*, *deferred maintenance*, *emergency maintenance*, *file maintenance*, *preventive maintenance*, *scheduled maintenance*.

**maintenance panel**

A part of a unit of equipment that is used for interaction between the unit of equipment and a maintenance engineer.

**maintenance time**

- (1) Time used for *hardware maintenance*. It includes *preventive maintenance time* and *corrective maintenance time*.
- (2) Contrast with *available time*.
- (3) See *corrective maintenance time*, *de-*

*ferred maintenance time, emergency maintenance time, preventive maintenance time.*

**majority**

A logic *operator* having the property that if P is a statement, Q is a statement, R is a statement,..., then the majority of P, Q, R, ..., is true if more than half the statements are true, false if half or less are true.

**majority element**

A logic *element* that performs a *majority operation*. Synonymous with majority gate.

**majority gate**

Synonym for *majority element*.

**majority operation**

(ISO) A *threshold operation* in which each of the *operands* may take only the values *zero* and *one*, and that takes the value *one* if and only if the number of operands having the value *one* is greater than half the total number of operands.

**makeup time**

- (1) (ISO) That part of *available time* used for *reruns* due to *faults* or *mistakes* in *operating*.
- (2) Contrast with *development time*.

**malfunction**

(ISO) Synonym for *failure*.

**management information system (MIS)**

- (1) (ISO) Management performed with the aid of *automatic data processing*.
- (2) An *information system* designed to aid in the performance of management *functions*.

**manipulation**

See *algebraic manipulation, formula manipulation, symbol manipulation*.

**mantissa**

- (1) (ISO) The positive fractional part of the representation of a logarithm. In the expression,  $\log 643 = 2.808$ , the .808 is the mantissa and the 2 is the *characteristic*.
- (2) (ISO) Synonym for *fixed-point part*.
- (3) Contrast with *characteristic*.

**manual input**

- (1) The entry of *data* by hand into a device.
- (2) The *data* entered as in (1).

**map**

- (1) (ISO) To establish a set of values having a defined correspondence with the quantities or values of another set. Synonymous with *map over*.
- (2) See *Karnaugh map*.

**map over**

(ISO) Synonym for *map*.

**marginal check**

Synonym for *marginal test*.

**marginal test**

*Maintenance* in which certain *operating conditions*, such as voltage or frequency supplied, are varied about their nominal values in order to detect and locate components with incipient *faults*. Synonymous with *marginal check*.

**mark**

- (1) (ISO) A *symbol* or symbols that indicate the beginning or the end of a *field*, of a *word*, of an *item* of *data* or of a set of data such as a *file*, a *record*, or a *block*.
- (2) See *document mark, group mark*,

**marker**

See *end-of-tape marker*.

**Markov chain**

A probabilistic model of events in which the probability of an event is dependent only on the event that precedes it.

**mark sensing**

- (1) The electrical sensing of manually recorded conductive marks on a non-conductive surface.
- (2) The automatic sensing of manually recorded marks on a *data medium*.

**mark-sensing card**

A card on which mark-sensible fields have been printed.

**mark-sensing column**

A line of mark-sensible *positions*, parallel to the *Y-datum line* of a card.

**mark-sensing row**

A line of mark-sensible *positions* parallel to the *X-datum line* of a card.

**mask**

- (1) (ISO) A pattern of *characters* that is used to control the retention or elimination of portions of another pattern of characters.
- (2) (ISO) To use a pattern of *characters* to control the retention or elimination of portions of another pattern of characters.

**mass storage**

(ISO) An *auxiliary storage* of very large *storage capacity* used for storage of *data* to which infrequent reference need be made. Synonymous with *bulk storage*.

**mass storage device**

A device having a large *storage capacity*, e.g., *magnetic disk*, *magnetic drum*.

**master file**

(ISO) A *file* that is used as an authority in a given *job* and that is relatively permanent, even though its contents may change. Synonymous with *main file*.

**match**

- (1) A *comparison* to determine identity of *items*.
- (2) Contrast with *hit*.

**mathematical check**

A programmed *check* that uses mathematical relationships. Synonymous with *arithmetic check*.

**mathematical induction**

(ISO) A method of proving a statement concerning terms based on *natural numbers* not less than  $N$  by showing that the statement is valid for the term based on  $N$  and that, if it is valid for an arbitrary value of  $n$  that is greater than  $N$ , it is also valid for the term based on  $(n + 1)$ .

**mathematical logic**

(ISO) Synonym for *symbolic logic*.

**mathematical model**

A mathematical representation of a *process*, device, or concept.

**mathematical programming**

- (1) (ISO) In *operations research*, a procedure for locating the maximum or minimum of a *function* subject to constraints.
- (2) Contrast with *convex programming*, *dynamic programming*, *integer programming*, *linear programming*, *non-linear programming*, *quadratic programming*.

**matrix**

- (1) (ISO) A rectangular array of elements, arranged in rows and columns, that

may be manipulated according to the rules of matrix algebra.

- (2) In *computers*, a logic network in the form of an array of *input* leads and *output* leads with *logic elements* connected at some of their intersections.
- (3) By extension, an array of any number of dimensions.
- (4) See *dot matrix*.

#### matrix printer

(ISO) A printer in which each *character* is represented by a pattern of dots. Synonymous with dot printer, stylus printer, wire printer.

#### matrix storage

*Storage*, the elements of which are arranged such that access to any *location* requires the use of two or more coordinates, e.g., *cathode ray storage*, *magnetic core storage*.

#### mean conditional information content

(ISO) Synonym for *conditional entropy*.

#### mean entropy

See *character mean entropy*.

#### mean information content

(ISO) Synonym for *entropy*.

#### mean repair time

(ISO) Deprecated term for *mean-time-to-repair*.

#### mean-time-between-failures (MTBF)

(ISO) For a stated period in the life of a *functional unit*, the mean value of the lengths of time between consecutive *failures* under stated conditions.

#### mean-time-to-repair (MTTR)

(ISO) The average time required for *corrective maintenance*.

#### mean transinformation content

- (1) (ISO) In *information theory*, the mean of the *transformation content* conveyed by the occurrence of any one of a finite number of mutually exclusive and jointly exhaustive events, given the occurrence of another set of mutually exclusive events; in mathematical *notation*, the mean transinformation content,  $T$ , for a set of events  $x_1 \dots x_n$  which are dependent on the occurrence of events from another set  $y_1 \dots y_m$  with joint probabilities  $p(x_i, y_j)$  of the occurrence of both events  $x_i, y_j$ , equals the mathematical expectation of the transinformation content  $T(x_i | y_j)$  of all pairs of events:

$$T = \sum_{i=1}^n \sum_{j=1}^m p(x_i, y_j) T(x_i | y_j)$$

The mean transinformation content also is equal to the difference between the *entropy* of one of the two sets of events and the *conditional entropy* of this set relative to the other. For instance, in transmitting one *message*, the difference between the entropy at the *message source* and the *equivocation*, and the difference between the entropy at the *message sink* and the *irrelevance* are equal, i.e.:

$$T = H(x) - H(x|y) = H(y) - H(y|x)$$

Synonymous with average transinformation content.

- (2) See *character mean transinformation content*.

**measure of information**

See *information measure*.

**medium**

See *data medium*, *empty medium*, *machine readable medium*, *virgin medium*.

**member**

(ISO) Synonym for *element*.

**memory**

(ISO) Deprecated term for *main storage*.

**memory protection**

Deprecated term for *storage protection*.

**mercury storage**

A *storage device* that utilizes the acoustic properties of mercury to *store data*.

**merge**

- (1) (ISO) To combine the *items* of two or more sets that are each in the same given *order* into one set in that order.
- (2) See *balanced merge*.
- (3) See also *collate*.

**merge sort**

- (1) A *sort program* in which the *items* in a *set* are divided into *subsets*, the items in each subset are sorted, and the resulting sorted subsets are *merged*.
- (2) See *balanced merge sort*, *unbalanced merge sort*.

**merging**

See *order-by-merging*, *sequence-by-merging*.

**message**

- (1) An arbitrary amount of *information* whose beginning and end are defined or implied.
- (2) (ISO) In *information theory*, an or-

dered series of *characters* intended to convey *information*.

- (3) See *error message*.

**message sink**

(ISO) That part of a communication system in which *messages* are considered to be received.

**message source**

(ISO) That part of a communication system from which *messages* are considered to originate. Synonymous with *information source*.

**metalanguage**

A *language* used to specify itself, or other languages.

**MICR**

*Magnetic ink character recognition*.

**microfiche**

A sheet of *microfilm* capable of containing *microimages* in a grid pattern, usually containing a title that can be read without magnification.

**microfilm**

- (1) A high resolution film for recording *microimages*.
- (2) To record *microimages* on film.
- (3) See *computer output microfilm*.

**microfilmer**

See *computer output microfilmer*.

**microform**

Any medium that contains *microimages*.

**micrographics**

That branch of science and technology concerned with methods and techniques for converting any form of information to or from *microform*.



**microimage**

An image too small to read without magnification.

**microprogram**

(ISO) A *sequence* of elementary *instructions* that correspond to a *computer operation*, that is maintained in special *storage*, and whose *execution* is initiated by the introduction of a *computer instruction* into an *instruction register* of a *computer*.

**microprogramming**

(ISO) The preparation or use of *microprograms*.

**minimum delay programming**

(ISO) A method of *programming* in which *storage locations* for *instructions* and *data* are chosen so that *access time* is reduced and minimized.

**minimum distance code**

A *binary code* in which the *signal distance* does not fall below a specified minimum value.

**minuend**

(ISO) In subtraction, the *number* or quantity from which another number or quantity is subtracted.

**MIS**

*Management information system*.

**miscellaneous time**

(ISO) The time during which a *computer* is used for demonstrations, training, or other such purposes. Synonymous with incidental time.

**mistake**

- (1) A human action that produces an unintended result.
- (2) Contrast with *error*, *failure*, *fault*, *malfunction*.

**mixed-base notation**

(ISO) Synonym for *mixed-base numeration system*.

**mixed-base numeration system**

- (1) (ISO) A *numeration system* in which a *number* is represented as the sum of a series of terms each of which consists of a *mantissa* and a *base*, the base of a given term being constant for a given application but the bases being such that there are not necessarily integral ratios between the bases of all the terms, e.g., with bases  $b_3$ ,  $b_2$ , and  $b_1$  and mantissae 6, 5, and 4, the number represented is given by  $6b_3 + 5b_2 + 4b_1$ . A *mixed-radix numeration system* is the particular case of a mixed-base numeration system in which, when the terms are *ordered* so that their bases are in descending magnitudes, there is an integral ratio between the bases of adjacent terms, but not the same ratio in each case; thus if the smallest base is  $b$  and if  $x$  and  $y$  represent *integers*, the numeral 654 in such a numeration system represents the number given by  $6xyb + 5xb + 4b$ . A *fixed-radix numeration system* is the particular case of a mixed-base numeration system in which, when the terms are ordered so that their bases are in descending magnitudes, there is the same integral ratio between bases of all pairs of adjacent terms; thus if  $b$  is the smallest base and if  $x$  represents an integer, the numeral 654 in such a numeration system represents the number given by  $6x^2b + 5xb + 4b$ . Synonymous with mixed-base notation.

- (2) Contrast with *mixed-radix numeration system*.

**mixed-radix notation**

(ISO) Synonym for *mixed-radix numeration system*.

#### **mixed-radix numeration system**

- (1) (ISO) A *radix numeration system* in which the *digit places* do not all necessarily have the same *radix*, e.g., the *numeration system* in which three successive *digits* represent hours, tens of minutes, and minutes; taking one minute as the unit, the *weights* of the three digit places are 60, 10 and 1 respectively; the radices of the second and third digit places are 6 and 10 respectively. A comparable numeration system that used one or more digits to represent days and two digits to represent hours would not satisfy the definition of any radix numeration system, since the ratio of the weights of the "days" and the "tens of hours" digit places would not be an integer. Synonymous with mixed-radix notation.
- (2) Contrast with *mixed-base numeration system*.

#### **mnemonic symbol**

(ISO) A *symbol* chosen to assist the human memory, e.g., an abbreviation such as "mpy" for "multiply."

#### **mode**

See *access mode*, *conversational mode*, *load mode*, *move mode*.

#### **model**

See *mathematical model*.

#### **modem (Modulator-demodulator)**

A device that modulates and demodulates signals transmitted over data communication facilities.

#### **modifier register**

(ISO) Synonym for *index register*.

#### **modularity**

The extent to which a system is composed of modules.

#### **modulator-demodulator**

See *modem*.

#### **module**

- (1) A *program unit* that is discrete and identifiable with respect to *compiling*, combining with other units, and *loading*, e.g., the *input* to, or *output* from, an *assembler*, *compiler*, *linkage editor*, or *executive routine*.
- (2) A packaged functional *hardware unit* designed for use with other components.
- (3) See *object module*, *programming module*.

#### **modulo-n check**

Synonym for *residue check*.

#### **modulo-n counter**

(ISO) A *counter* in which the *number* represented reverts to zero in the *sequence* of counting after reaching a maximum value of  $n - 1$ .

#### **modulo-two sum**

(ISO) Deprecated term for *nonequivalence operation*.

#### **monadic boolean operator**

A *boolean operator* having only one operand, e.g., *NOT*.

#### **monadic operation**

(ISO) An *operation* with one and only one operand. Synonymous with *unary operation*.

#### **monadic operator**

(ISO) An *operator* that represents an operation on one and only one operand. Synonymous with *unary operator*.

**monitor**

- (1) (ISO) A device that observes and verifies the operations of a *data processing system* and indicates any significant departure from the norm.
- (2) *Software* or *hardware* that observes, supervises, controls, or verifies the operations of a *system*.

**monitoring program**

(ISO) Synonym for *monitor program*.

**monitor program**

(ISO) A *computer program* that observes, regulates, controls, or verifies the operations of a *data processing system*. Synonymous with *monitoring program*.

**monostable**

Pertaining to a device that has one *stable state*.

**monostable circuit**

A *trigger circuit* that has one *stable state* and one *unstable state*. Synonymous with *monostable trigger circuit*.

**monostable trigger circuit**

Synonym for *monostable circuit*.

**Monte Carlo method**

(ISO) A method of obtaining an approximate solution to a numerical problem by the use of *random numbers*, e.g., the *random walk method*, or a *procedure* using a *random number sequence* to calculate an integral.

**move**

- (1) (ISO) In *computer programming*, to *copy* from *locations* in *internal storage* into *locations* in the same *internal storage*.
- (2) (ISO) Synonym for *transfer*.

**move mode**

- (1) In some variable-word-length *computers*, *data transmission* such that certain *delimiters* are not moved with the *data*.
- (2) Contrast with *load mode*.

**MTBF**

*Mean-time-between-failures*.

**MTTR**

*Mean-time-to-repair*.

**multiaddress**

Pertaining to an *instruction format* containing more than one *address part*.

**multiaddress instruction**

(ISO) An *instruction* that contains more than one *address part*. Synonymous with *multiple address instruction*.

**multi-aperture core**

(ISO) A *magnetic core*, usually used for *nondestructive reading*, with two or more holes through which wires may be passed in order to create more than one magnetic path. Synonymous with *multiple aperture core*.

**multidimensional language**

- (1) A *language* whose *expressions* are assembled in more than one dimension, e.g., *flowcharts*, *logic diagrams*, *block diagrams*, and *decision tables*.
- (2) Contrast with *one-dimensional language*.

**multilevel address**

(ISO) Synonym for *indirect address*.

**multipass sort**

A *sort program* that is designed to *sort* more *items* than can be in *main storage* at one time.

**multiple address instruction**

(ISO) Synonym for *multiaddress instruction*.

**multiple aperture core**

(ISO) Synonym for *multi-aperture core*.

**multiple precision**

(ISO) Pertaining to the use of two or more *computer words* to represent a *number* in order to enhance *precision*.

**multiple punching**

The *punching* of more than one hole in the same *card column* by means of more than one keystroke, usually in order to extend the *character set* of the punch.

**multiplex**

To *interleave* or simultaneously *transmit* two or more *messages* on a single *channel*.

**multiplexer**

A device capable of *interleaving* the events of two or more activities or capable of distributing the events of an interleaved sequence to the respective activities.

**multiplex operation**

A mode of *operation* in which the events of two or more activities are *interleaved* and when required the events in the interleaved *sequence* are distributed to the respective activities.

**multiplicand**

(ISO) In a multiplication *operation*, the *factor* that is multiplied by another *number* or quantity.

**multiplier**

(1) (ISO) In multiplication, the *number* or quantity by which the *multiplicand* is multiplied.

(2) (ISO) Synonym for *multiplier factor*.

(3) See *quarter squares multiplier*.

**multiplier factor**

(ISO) In a multiplication *operation*, the factor by which the *multiplicand* is multiplied. Synonymous with *multiplier*.

**multiply**

See *logical multiply*.

**multiplying punch**

(ISO) Synonym for *calculating punch*.

**multiprocessing**

(1) A mode of operating a *multiprocessor* that provides for the *parallel processing* of two or more *computer programs*.

(2) Pertaining to the *simultaneous execution* of two or more *computer programs* or *sequences of instructions* by a *computer* or *computer network*.

(3) Loosely, *parallel processing*.

**multiprocessor**

A *computer* employing two or more *central processing units* under integrated control.

**multiprogramming**

(1) A mode of *operation* that provides for the *interleaved execution* of two or more *computer programs* by a single *central processing unit*.

(2) Pertaining to the *concurrent execution* of two or more *computer programs* by a *computer*.

**multitasking**

Pertaining to the *concurrent execution* of two or more *tasks* by a *computer*.

**mutual information**

(ISO) Synonym for *transinformation content*.

## N

**n-address instruction**

(ISO) An *instruction* that contains *n* *address parts*.

**n-adic boolean operation**

(ISO) A *boolean operation* on *n* and only *n* *operands*.

**n-adic operation**

(ISO) An *operation* on *n* and only *n* *operands*. Synonymous with *n-ary operation*.

**NAK**

The *negative acknowledge character*.

**name**

See *data name, qualified name*.

**NAND**

A *logic operator* having the property that if *P* is a statement, *Q* is a statement, *R* is a statement,...,then the **NAND** of *P*, *Q*, *R*,... is true if at least one statement is false, false if all statements are true. Synonymous with *nonconjunction*, **NOT-AND**, *Sheffer stroke*.

**NAND element**

A *logic element* that performs the *boolean operation of nonconjunction*. Synonymous with **NAND gate**.

**NAND gate**

Synonym for *NAND element*.

**NAND operation**

(ISO) Synonym for *nonconjunction*.

**n-ary**

- (1) (ISO) Pertaining to a selection, choice, or condition that has *n* possible different values or states.
- (2) (ISO) Pertaining to a *fixed-radix numeration system* having a *radix* of *n*.

**n-ary boolean operation**

(ISO) Deprecated term for *n-adic boolean operation*.

**n-ary operation**

(ISO) Synonym for *n-adic operation*.

**NAT**

(ISO) *Information content natural unit*.

**natural language**

- (1) (ISO) A *language* whose rules are based on current usage without being explicitly prescribed.
- (2) Contrast with *artificial language*.

**natural number**

(ISO) One of the *numbers zero, 1, 2, ...*. Synonymous with *nonnegative number*.

**n-bit byte**

(ISO) A *byte* composed of *n* *binary elements*.

**n-core-per-bit storage**

(ISO) A *storage device* in which each *storage cell* uses *n* *magnetic cores* per *binary character*.

**NDR**

(ISO) *Nondestructive read*.

**NDRO**

(ISO) *Nondestructive readout*.

**needle**

A *probe* in a manual information retrieval operation that may be passed through holes or notches to assist in sorting or selecting cards.

**negate**

(1) (ISO) To perform the *operation of negation*.



(2) To perform the logic operation *NOT*.

### negation

(ISO) The monadic *boolean* operation the result of which has the boolean value opposite to that of the *operand*. Synonymous with *NOT* operation.

### negative acknowledge character (NAK)

(ISO) A *transmission control character* transmitted by a station as a negative response to the station with which the connection has been set up.

### negentropy

(ISO) Deprecated term for *entropy*.

### neither-nor operation

(ISO) Synonym for *nondisjunction*.

### nest

- (1) (ISO) To incorporate a structure or structures of some kind into a structure of the same kind. For example, to nest one *loop* (the nested loop) within another loop (the nesting loop); to nest one *subroutine* (the nested subroutine) within another subroutine (the nesting subroutine).
- (2) To embed *subroutines* or *data* in other subroutines or data at a different hierarchical level such that the different levels of routines or data can be *executed* or *accessed* recursively.

### network

See *computer network*.

### network analog

The *expression* and solution of mathematical relationships between *variables* using a circuit or circuits to represent these variables.

### network analyzer

A device that *simulates* a network such as an electrical supply network.

### new-line character (NL)

- (1) (ISO) A *format effector* that causes the print or *display position* to move to the first position on the next line.
- (2) Contrast with *carriage return character*.

### nines complement

(ISO) The *diminished radix complement* in the *decimal numeration system*. Synonymous with complement-on-nine.

### NL

The *new line character*.

### n-level address

An *indirect address* that specifies *n* levels of addressing.

### node

- (1) The representation of a state or an event by means of a point on a diagram.
- (2) In a tree structure, a point at which subordinate *items* of *data* originate.

### noise

- (1) Random variations of one or more characteristics of any entity such as voltage, current, or *data*.
- (2) A random *signal* of known statistical properties of amplitude, distribution, and spectral density.
- (3) Loosely, any disturbance tending to interfere with the normal operation of a device or *system*.

### nonconjunction

- (1) (ISO) The *dyadic boolean operation* the result of which has the boolean value 0 if and only if each *operand* has the boolean value 1. Synonymous with *NAND*, *NAND* operation, *NOT BOTH* operation.

- (2) Contrast with *conjunction*.

**nondestructive read (NDR)**

(ISO) A *read* process that does not *erase* the *data* in the source. Synonymous with nondestructive readout.

**nondestructive readout (NDRO)**

(ISO) Synonym for *nondestructive read*.

**nondisjunction**

- (1) (ISO) The *dyadic boolean operation* the *result* of which has the boolean value 1 if and only if each *operand* has the boolean value 0. Synonymous with neither-nor operation, nor operation.

- (2) Contrast with *disjunction*.

**nonequivalence operation**

- (1) (ISO) The *dyadic boolean operation* the *result* of which has the boolean value 1 if and only if the *operands* have different boolean values. Synonymous with exclusive-OR operation.

- (2) Contrast with *equivalence operation*.

**nonerasable storage**

(ISO) Synonym for *fixed storage*.

**nonidentity operation**

- (1) (ISO) The *boolean operation* the *result* of which has the boolean value 1 if and only if all the *operands* do not have the same boolean value. A nonidentity operation on two operands is a *nonequivalence operation*.

- (2) Contrast with *identity operation*.

**nonlinear optimization**

(ISO) Synonym for *nonlinear programming*.

**nonlinear programming**

- (1) (ISO) In *operations research*, a *proce-*

*dure* for locating the maximum or minimum of a *function* of *variables* that are subject to constraints, when either the function or the constraints, or both, are nonlinear. Synonymous with nonlinear optimization.

- (2) Contrast with *convex programming*, *dynamic programming*, *integer programming*, *linear programming*, *mathematical programming*, *quadratic programming*.

**nonlocking**

- (1) (ISO) Of *code extension characters*, having the characteristic that the change in interpretation applies only to a specified number of the *coded representations* following, commonly only one.

- (2) Contrast with *locking*.

**nonnegative number**

(ISO) Synonym for *natural number*.

**non-polarized return-to-zero recording (RZ(NP))**

*Return-to-reference recording* in which zeros are represented by the absence of magnetization, ones are represented by a specified condition of magnetization, and the reference condition is zero magnetization. The specified condition is usually saturation. Conversely, the absence of magnetization can be used to represent ones, and the magnetized condition to represent zeros. Synonymous with dipole modulation.

**non-return-to-change recording**

A method of recording in which ones are represented by a specified condition of magnetization and zeros are represented by a different condition.

**non-return-to-reference recording**

The *magnetic recording* of *bits* in which

the patterns of magnetization used to represent zeros and ones occupy the whole storage cell, with no part of the cell magnetized to a reference condition.

**non-return-to-zero change-on-ones recording (NRZI)**

*Non-return-to-reference recording* in which ones are represented by a change in the condition of magnetization, and zeros are represented by the absence of a change. This method is called NRZ (mark) recording because only the one or mark signals are explicitly recorded. Synonymous with non-return-to-zero (mark) recording, NRZ(M).

**non-return-to-zero (change) recording (NRZ(C))**

*Non-return-to-reference recording* in which zeros are represented by magnetization to a specified condition, and ones are represented by magnetization to a specified alternative condition. The two conditions may be saturation and zero magnetization but are more commonly saturation in opposite senses. This method is called NRZ (change) recording because the recorded magnetic condition is changed when, and only when, the recorded bit changes from zero to one or from one to zero.

**non-return-to-zero (mark) recording (NRZ(M))**

Synonym for *non-return-to-zero change-on-ones recording*.

**non-return-to-zero recording (NRZ)**

*Non-return-to-reference recording* in which the reference condition is zero magnetization.

**non-volatile storage**

(ISO) A storage whose content is not lost when the power is removed.

**no-op**

(ISO) *No-operation instruction*.

**no-operation instruction**

(ISO) An instruction whose execution causes a computer to do nothing other than to proceed to the next instruction to be executed. Synonymous with do-nothing operation.

**NOR**

A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the NOR of P, Q, R,... is true if all statements are false, false if at least one statement is true. P NOR Q is often represented by a combination of OR and NOT symbols, such as  $\sim(P \vee Q)$ . P NOR Q is also called neither P nor Q. Synonymous with NOT-OR.

**NOR element**

A logic element that performs the boolean operation of nondisjunction. Synonymous with NOR gate.

**NOR gate**

Synonym for NOR element.

**normal direction flow**

(ISO) A flow direction from left to right or top to bottom on a flowchart.

**normalize**

(1) (ISO) to make an adjustment to the fixed-point part and the corresponding adjustment to the exponent in a floating-point representation to ensure that the fixed-point part lies within some prescribed range, the real number represented remaining unchanged. Synonymous with standardize.

(2) Loosely, to scale.

(3) (ISO) Deprecated term for scale.

**normalized form**

(ISO) The form taken by a *floating-point representation* when the *fixed-point part* lies within some prescribed standard range, so chosen that any given *real number* is represented by a unique pair of *numerals*. Synonymous with standard form.

**NOR operation**

(ISO) Synonym for *nondisjunction*.

**NOT**

A logic *operator* having the property that if P is a statement, then the NOT of P is true if P is false, false if P is true. The NOT of P is often represented by  $\bar{P}$ ,  $\sim P$ ,  $\neg P$ ,  $P'$ .

**NOT-AND**

Synonym for *NAND*.

**NOT AND operation**

(ISO) Deprecated term for *nonconjunction*.

**notation**

- (1) (ISO) A set of *symbols*, and the rules for their use, for the representation of *data*.
- (2) See *binary notation*, *decimal notation*, *infix notation*, *parentheses-free notation*, *postfix notation*, *prefix notation*.

**NOT BOTH operation**

(ISO) Synonym for *nonconjunction*.

**NOT element**

A logic *element* that performs the *boolean operation* of *negation*. Synonymous with NOT gate.

**NOT gate**

Synonym for *NOT element*.

**NOT-IF-THEN element**

A logic element that performs the *boolean operation* of *exclusion*. Synonymous with NOT-IF-THEN gate.

**NOT-IF-THEN gate**

Synonym for *NOT-IF-THEN element*.

**NOT-IF-THEN operation**

(ISO) Synonym for *exclusion*.

**NOT operation**

(ISO) Synonym for *negation*.

**NOT-OR**

Synonym for *NOR*.

**NOT-OR operation**

(ISO) Deprecated term for *nondisjunction*.

**noughts complement**

(ISO) Synonym for *radix complement*.

**n-plus-one address instruction**

(ISO) An *instruction* that contains  $n + 1$  *address parts*, the plus-one address being that of the instruction that is to be *executed* next unless otherwise specified.

**NRZ**

*Non-return-to-zero recording*.

**NRZ(C)**

*Non-return-to-zero (change) recording*.

**NRZI**

*Non-return-to-zero change-on-ones recording*.

**NRZ(M)**

*Non-return-to-zero (mark) recording*.

**n-tuple length register**

(ISO)  $N$  *registers* logically or physically connected to function as a single register.



Each register may be individually accessed. Synonymous with *n-tuple register*.

**n-tuple register**

(ISO) Synonym for *n-tuple length register*.

**NUL**

The *null character*.

**null character (NUL)**

(1) (ISO) A *control character* that is used to to accomplish media-fill or time-fill and that may be inserted into or removed from a *sequence of characters* without affecting the meaning of the sequence; however, the control of equipment or the format may be affected by this character.

(2) See also *space character*.

**null set**

(ISO) Synonym for *empty set*.

**null string**

(1) (ISO) A *string* containing no entity.

(2) The notion of a *string* depleted of its entities, or the notion of a string prior to establishing its entities.

**number**

(1) A mathematical entity that may indicate quantity or amount of *units*.

(2) Loosely, a *numeral*.

(3) See *binary number*, *complex number*, *Fibonacci number*, *irrational number*, *level number*, *natural number*, *random number*, *rational number*, *serial number*.

**number representation**

(ISO) A representation of a *number* in a *numeration system*. Synonymous with *numeration*.

**number representation system**

(ISO) Synonym for *numeration system*.

**number sequence**

See *pseudo-random number sequence*, *random number sequence*.

**number system**

(ISO) Deprecated term for *numeration system*.

**numeral**

(1) (ISO) A *discrete representation* of a number. The following are four different numerals that represent the same number, i.e., a dozen, in the methods shown: twelve, by a word in the English language; 12, in the *decimal numeration system*; XII by Roman numerals; 1100 in the *pure binary numeration system*.

(2) See *binary numeral*, *decimal numeral*.

**numeration**

(ISO) Synonym for *number representation*.

**numeration system**

(1) (ISO) Any *notation* for the representation of numbers. Synonymous with *number representation system*.

(2) See *decimal numeration system*, *fixed-radix numeration system*, *mixed-base numeration system*, *mixed-radix numeration system*, *pure binary numeration system*, *radix numeration system*.

**numeric**

(ISO) Pertaining to *data* or to physical quantities represented by *numerals*. Synonymous with *numerical*.

**numerical**

(ISO) Synonym for *numeric*.

**numerical analysis**

The study of methods of obtaining useful quantitative solutions to problems that have been expressed mathematically, including the study of the *errors* and



bounds on errors in obtaining such solutions.

**numerical control (NC, NCMT)**

(ISO) *Automatic control of a process performed by a device that makes use of numerical data usually introduced as the operation is in progress.*

**numeric character**

(ISO) Synonym for *digit (1)*.

**numeric character set**

(ISO) A *character set* that contains *digits* and may contain *control characters*, *special characters*, and the *space character*, but not *letters*.

**numeric character subset**

(ISO) A *character subset* that contains *digits* and may contain *control characters*, *special characters*, and the *space character*, but not *letters*.

**numeric code**

(ISO) A *code* according to which *data* is represented by a *numeric character set*.

**numeric coded character set**

(ISO) A *coded character set* whose *character set* is a *numeric character set*.

**numeric data**

- (1) (ISO) *Data represented by numerals.*
- (2) *Data represented by numerals and some special characters.*

**numeric punch**

A hole *punched* in one of the *punch rows* designated as zero through nine. A zero-punch, and sometimes an eight- or nine-punch, in combination with another numeric punch, is considered a *zone punch*.

**numeric representation**

(ISO) A *discrete representation of data by numerals*.

**numeric word**

(ISO) A *word* consisting of *digits* and possibly *space characters* and *special characters*. For example, in the Universal Decimal Classification system, the *numeric word* 61(03)=20 is used as an identifier for any medical encyclopedia in English.

## O

**object code**

Output from a *compiler* or *assembler* which is itself *executable machine code* or is suitable for *processing* to produce *executable machine code*.

**object language**

- (1) (ISO) A *language* that is specified by a *metalanguage*.
- (2) (ISO) Synonym for *target language*.

**object module**

A *module* that is the *output* of an *assembler* or *compiler* and is *input* to a *linkage editor*.

**object program**

- (1) (ISO) A fully *compiled* or *assembled program* that is ready to be loaded into the *computer*.
- (2) Synonym for *target program*.
- (3) Contrast with *source program*.

**OCR**

*Optical character recognition*.

**octal**

(ISO) Pertaining to a *fixed-radix numeration system* having a *radix* of eight.

**octet**

(ISO) A *byte* composed of eight *binary elements*.

**odd-even check**

Synonym for *parity check*.

**offline**

Pertaining to equipment or devices not under control of a *central processing unit*.

**offline storage**

*Storage* not under control of the *central processing unit*.

**one-address instruction**

(ISO) An *instruction* that contains one *address part*.

**one-ahead addressing**

A method of *implied addressing* in which the *operation part* of an *instruction* implicitly addresses the *operands* in the *location* following the location of the operands of the last instruction *executed*.

**one-core-per-bit storage**

(ISO) A *storage device* in which each *storage cell* uses one *magnetic core* per *binary character*.

**one-dimensional language**

- (1) A *language* whose *expressions* are customarily represented as *strings* of *characters*, e.g., *FORTRAN*.
- (2) Contrast with *multi-dimensional language*.

**one-level address**

(ISO) Synonym for *direct address*.

**one-plus-one address instruction**

(ISO) An *instruction* that contains two *address parts*, the plus one *address* being that of the instruction that is to be *executed* next unless otherwise specified.

**ones complement**

(ISO) The *diminished radix complement* in the *pure binary numeration system*.  
Synonymous with *complement-on-one*.

**online**

- (1) Pertaining to equipment or devices under the direct control of a *central processing unit*.
- (2) Pertaining to a user's ability to interact with a *computer*.
- (3) Pertaining to the user's access to a *computer* via a *terminal*.

**online storage**

Storage under control of the *central processing unit*.

**on-the-fly printer**

(ISO) An *impact printer* in which the type slugs do not stop moving during the impression time. Synonymous with *hit-on-the-fly printer*.

**open-ended**

Pertaining to a *process* or *system* that can be augmented.

**open shop**

- (1) Pertaining to the *operation* of a *computer* facility in which most productive problem *programming* is performed by the problem originator rather than by a group of programming specialists. The use of the computer itself may also be described as open shop if the user/*programmer* also serves as the *operator*.
- (2) Contrast with *closed shop*.

**open subroutine**

- (1) (ISO) A *subroutine* of which a replica must be inserted at each place in a *computer program* at which the subroutine is used. Synonymous with *direct insert subroutine*.
- (2) Contrast with *closed subroutine*.

**operand**

- (1) (ISO) An entity to which an *operation* is applied.
- (2) That which is *operated upon*. An operand is usually identified by an *address part* of an *instruction*.

**operating system**

(ISO) *Software* that controls the *execution* of *computer programs* and that may provide scheduling, *debugging*, *input-output* control, accounting, *compilation*, *storage*

assignment, *data management*, and related services.

**operating time**

- (1) That part of *available time* during which the *hardware* is *operating* and is assumed to be yielding correct results. It includes *program development time*, *production time*, *makeup time*, and *miscellaneous time*.
- (2) Contrast with *idle time*.

**operation**

- (1) (ISO) A well-defined action that, when applied to any permissible combination of known entities, produces a new entity.
- (2) A defined action, namely, the act of obtaining a *result* from one or more *operands* in accordance with a rule that completely specifies the result for any permissible combination of operands.
- (3) A *program* step undertaken or *executed* by a *computer*, e.g., addition, multiplication, *extraction*, *comparison*, *shift*, *transfer*. The *operation* is usually specified by the *operator* part of an *instruction*.
- (4) The event or specific action performed by a *logic element*.
- (5) See *arithmetic operation*, *asynchronous operation*, *auxiliary operation*, *binary arithmetic operation*, *boolean operation*, *complementary operation*, *computer operation*, *concurrent operation*, *control operation*, *dual operation*, *dyadic boolean operation*, *dyadic operation*, *equivalence operation*, *fixed-cycle operation*, *identity operation*, *logic operation*, *majority operation*, *monadic operation*, *multiplex operation*, *n-adic boolean operation*, *n-adic operation*, *non-equivalence operation*, *non-identity operation*, *parallel operation*, *sequential operation*, *serial operation*, *simultane-*

*ous operation, single-step operation, threshold operation.*

**operation code**

(ISO) A *code* used to represent the *operations* of a *computer*.

**operation decoder**

A device that selects one or more control *channels* according to the *operation part* of a *machine instruction*.

**operation part**

(ISO) A part of an *instruction* that usually contains only an explicit specification of the *operation* to be performed. For an exception to "usually," see *implied addressing*. Synonymous with *function part*, *operator part*.

**operations analysis**

(ISO) Synonym for *operations research*.

**operations research (OR)**

(ISO) The application of scientific methods to the solution of complex problems concerning the optimal allocation of available resources. Synonymous with *operations analysis*.

**operation table**

(1) (ISO) A *table* that defines an *operation* by *listing* all permissible combinations of values of the *operands* and indicating the *result* for each of these combinations.

(2) See *boolean operation table*.

**operator**

(1) (ISO) A *symbol* that represents the action to be performed in a mathematical *operation*.

(2) In the description of a *process*, that which indicates the action to be performed on *operands*.

(3) A person who *operates* a machine.

(4) See *boolean operator, complementary operator, dyadic operator, monadic boolean operator, monadic operator, quaternary operator, unary operator*.

**operator console**

(ISO) A *functional unit* containing devices that are used for communication between a *computer operator* and an *automatic data processing system*.

**operator control panel**

(ISO) A part of an *operator console*, of a *computer*, or of an *automatic data processing system* that contains *switches* used to control the system or part of the system and that may contain *indicators* giving *information* on the functioning of the system or of part of the system.

**operator part**

(ISO) Synonym for *operation part*.

**optical character recognition (OCR)**

(1) The machine identification of printed *characters* through use of light sensitive devices.

(2) Contrast with *magnetic ink character recognition*.

**optical scanner**

(1) (ISO) A *scanner* that uses light for examining patterns.

(2) A device that scans optically and usually generates an *analog* or *digital signal*.

**optional pause instruction**

(ISO) An *instruction* that allows manual suspension of the *execution* of a *computer program*. Synonymous with *optional stop instruction*.

**optional-stop instruction**

(ISO) Synonym for *optional pause instruction*.

**OR**

- (1) A logic *operator* having the property that if P is a statement, Q is a statement, R is a statement,... then the OR of P, Q, R,..., is true if at least one statement is true, false if all statements are false.  $P \text{ OR } Q$  is often represented by  $P + Q$ ,  $P \vee Q$ . Synonymous with boolean add.
- (2) Contrast with *exclusive OR*.
- (3) *Operations research*.

**order**

- (1) (ISO) A specified arrangement used in ordering. An order need not be linear.
- (2) An arrangement of *items* according to any specified *set* of rules.
- (3) (ISO) To place *items* in an arrangement in accordance with specified rules.
- (4) To arrange *items* according to any specified *set* of rules. Synonymous with sort.
- (5) (ISO) Deprecated term for *instruction, sequence (1)*.

**order-by-merging**

- (ISO) To *order* by repeated splitting and *merging*.

**order code**

- (ISO) Deprecated term for *operation code*.

**ordering bias**

- (ISO) The manner and degree by which the *order* of a *set* of *items* departs from random distribution. An ordering bias will make the effort necessary to order a set of items more than or less than the effort that would be required for a similar set with random distribution.

**OR gate**

- A gate that implements the logic OR operator.

**OR operation**

- Synonym for *disjunction*.

**oscillating sort**

- A *merge sort* in which the *sorts* and *merges* are performed alternately to form one sorted *set*.

**outconnector**

- (1) In *flowcharting*, a *connector* that indicates a point at which a *flowline* is broken for continuation at another point.
- (2) Contrast with *inconnector*.

**output**

- (1) (ISO) Pertaining to a device, process, or *channel* involved in an *output process*, or to the *data* or states involved in an output process.
- (2) See *input-output, real-time output*.

**output area**

- An area of *storage* reserved for *output*.

**output channel**

- A *channel* for conveying *data* from a device or *logic element*.

**output data**

- (ISO) *Data* being delivered or to be delivered from a device or from a *computer program*.

**output device**

- (ISO) Synonym for *output unit*.

**output process**

- (ISO) The *process* that consists of the delivery of *data* from a *data processing system*, from a subsystem, or from a device.

**output program**

- (ISO) A *utility program* that organizes the *output process* of a *computer*.



**output routine**

(ISO) A *utility routine* that organizes the *output process* of a *computer*.

**output unit**

(ISO) A device in a *data processing system* by which *data* may be received from the *system*. Synonymous with *output device*.

**overflow**

See *arithmetic overflow*.

**overhead operation**

(ISO) Synonym for *housekeeping operation*.

**overlay**

- (1) (ISO) In a *computer program*, a *segment* that is not permanently maintained in *internal storage*.
- (2) The technique of repeatedly using the same areas of *internal storage* during different stages of a *program*.
- (3) (ISO) In the *execution* of a *computer*

*program*, to *load* a *segment* of the *computer program* in a *storage area* hitherto occupied by parts of the *computer program* that are not currently needed.

**overlay supervisor**

A *routine* that controls the proper *sequencing* and *positioning* of *segments* of *computer programs* in limited *storage* during their *execution*.

**overpunch**

- (1) To add holes in a *card column* that already contains holes. Overpunches are often used to represent *special characters*.
- (2) To add holes to *perforated tape* to change a *character*, especially to produce a *delete character*.
- (3) Synonym for *zone punch*.

## P

**pack**

- (1) (ISO) To *store data* in a compact form in a *storage medium* by taking advantage of known characteristics of the data and the storage medium, in such a way that the original form of the data can be recovered, e.g., to make use of *bit* or *byte locations* that would otherwise go unused.
- (2) See *disk pack*.

**packing density**

The number of useful *storage cells* per *unit* of dimension, e.g., the number of *bits* per inch *stored* on a *magnetic tape track* or *magnetic drum track*.

**padding**

- (1) (ISO) A technique that incorporates *fillers* in *data*.
- (2) (ISO) Deprecated term for *filler*.

**page**

A *block* of *instructions*, or *data*, or both, that can be located in *main storage* or in *auxiliary storage*. *Segmentation* and *loading* of these blocks is *automatically* controlled by a *computer*.

**page-at-a-time printer**

Synonym for *page printer*.

**page printer**

- (1) A device that prints one page at a time, e.g., xerographic printer, cathode ray tube printer, film printer. Synonymous with *page-at-a-time printer*.
- (2) Contrast with *character printer*, *line printer*.

**page swapping**

Exchanging *pages* between *main storage* and *auxiliary storage*.

**page turning**

Synonym for *paging*.

**paging**

A *time sharing* technique in which *pages* are transferred between *main storage* and *auxiliary storage*. Synonymous with *page turning*.

**panel**

See *control panel*, *maintenance panel*, *operator control panel*.

**paper skip**

Synonym for *paper throw*.

**paper tape code**

Synonym for *perforated tape code*.

**paper throw**

The movement of paper through a printer at a speed greater than a single line spacing speed. Synonymous with *paper skip*.

**parallel**

- (1) Pertaining to the *concurrent operation* or *simultaneous operation* of two or more devices or to the concurrent performance of two or more activities in a single device.
- (2) Pertaining to the *concurrent* or *simultaneous* occurrence of two or more related activities in multiple devices or *channels*.
- (3) Pertaining to the *simultaneity* of two or more *processes*.
- (4) Pertaining to the *simultaneous processing* of the individual parts of a whole, such as the *bits* of a *character* and the characters of a *word*, using separate facilities for the various parts.
- (5) Contrast with *serial*.

**parallel adder**

(ISO) A *digital adder* in which addition is

performed *concurrently* on *digits* in all the *digit places* of the *operands*.

#### parallel addition

(ISO) Addition that is performed *concurrently* on *digits* in all the *digit places* of the *operands*.

#### parallel computer

- (1) A *computer* having multiple *arithmetic* or *logic units* that are used to accomplish *parallel operations* or *parallel processing*.
- (2) Contrast with *serial computer*.

#### parallel operation

- (1) The *concurrent* or *simultaneous execution* of two or more *operations* in devices such as multiple *arithmetic* or *logic units*.
- (2) Contrast with *serial operation*.

#### parallel processing

- (1) The *concurrent* or *simultaneous execution* of two or more *processes* in a *single unit*.
- (2) Contrast with *serial processing*.

#### parallel search storage

- (1) A *storage device* in which one or more parts of all *storage locations* are queried *simultaneously*.
- (2) Contrast with *associative storage*.

#### parallel storage

A *storage device* in which *digits*, *characters*, or *words*, are accessed *simultaneously* or *concurrently*.

#### parallel transmission

- (1) In *data communication*, the *simultaneous transmission* of a certain number of *signal elements* constituting the same *telegraph* or *data signal*. For example, use of a *code* according to which each *signal* is characterized by

a combination of three out of twelve frequencies *simultaneously* transmitted over the *channel*.

- (2) Contrast with *serial transmission*.

#### parameter

- (1) (ISO) A *variable* that is given a constant value for a specified application and that may denote the application.
- (2) See *external program parameter*, *preset parameter*, *program-generated parameter*.

#### parameter word

(ISO) A *word* that directly or indirectly provides or designates one or more *parameters*.

#### parenthesis-free notation

- (1) Any method of forming mathematical *expressions* in which expressions are delimited by means other than parentheses, e.g., *prefix notation*, *postfix notation*.
- (2) Contrast with *infix notation*.

#### parity bit

A *check bit* appended to an *array* of *binary digits* to make the *sum* of all the *binary digits*, including the *check bit*, always odd or always even.

#### parity check

A *check* that tests whether the number of ones (or zeros) in an *array* of *binary digits* is odd or even. Synonymous with odd-even check.

#### partial carry

- (1) (ISO) In *parallel addition*, a *procedure* in which some or all of the *carries* are temporarily *stored* instead of being immediately *transferred*.
- (2) Contrast with *complete carry*.

**partition**

(ISO) Deprecated term for *segment*.

**pass**

- (1) One cycle of *processing* a body of *data*.
- (2) See *sort pass*.

**patch**

- (1) A temporary electrical connection.
- (2) (ISO) To make an improvised modification. To modify a *routine* in a rough or expedient way.

**pattern recognition**

(ISO) The identification of shapes, forms, or configurations by *automatic* means.

**pattern sensitive fault**

- (1) A *fault* that appears in response to some particular pattern of *data*.
- (2) Contrast with *program sensitive fault*.

**pause instruction**

- (1) (ISO) An *instruction* that specifies the suspension of the *execution* of a *computer program*. A pause instruction is usually not an *exit*. Synonymous with halt instruction.
- (2) See *optional pause instruction*.

**PCM**

- (1) *Punched card machine*.
- (2) Pulse code modulation.

**PCS**

*Print contrast signal*.

**perforated tape**

A tape on which a pattern of holes or cuts is used to represent *data*.

**perforated tape code**

A *code* used to represent *data* on *perforated tape*. Synonymous with paper tape code.

**perforated-tape reader**

A device that converts holes or cuts in *perforated tape* into coded electrical *pulse* patterns.

**perforator**

See *receiving perforator*.

**peripheral control unit**

Synonym for *input-output controller*.

**peripheral equipment**

(ISO) In a *data processing system*, any equipment, distinct from the *central processing unit*, that may provide the system with outside communication or additional facilities.

**peripheral transfer**

(ISO) The *process* of *transmitting data* between two peripheral *units*.

**permanent storage**

- (1) (ISO) A *storage device* whose content cannot be modified.
- (2) Synonymous with fixed storage.
- (3) Contrast with *erasable storage*.

**permutation**

- (1) (ISO) An *ordered* arrangement of a given number of different *elements* selected from a *set*.
- (2) Contrast with *combination*.

**phase**

See *assembly phase*, *compile phase*, *execute phase*, *translate phase*.

**picture**

(ISO) In a *programming language*, a description of a *character string* in which each *position* has associated with it a *symbol* representing the properties of the *character* that may occupy it, e.g., in *COBOL*, 9999 is used as a picture of any 4-digit numeric word.

**pinboard**

- (1) A perforated board into which pins are manually inserted to control the *operation* of equipment.
- (2) Synonym for *plugboard*.

**pitch**

See *feed pitch*, *row pitch*, *track pitch*.

**PL/I**

A *programming language* designed for use in a wide range of commercial and scientific *computer applications*.

**plotter**

(ISO) An *output unit* that presents *data* in the form of a two-dimensional graphical representation.

**plugboard**

(ISO) A perforated board into which plugs or pins may be placed to control the *operation* of equipment. Synonymous with control panel, pinboard.

**plugboard chart**

A chart that shows, for a given job, where plugs or wires must be inserted into a *plugboard*. Synonymous with *plugging chart*.

**plugging chart**

Synonym for *plugboard chart*.

**pocket**

A *card stacker* in a *sorter*.

**point**

See *branchpoint*, *breakpoint*, *checkpoint*, *decimal point*, *entry point*, *radix point*, *reentry point*, *rerun point*, *restart point*.

**pointer**

An *identifier* that indicates the *location* of an *item* of *data*.

**polarized dipole magnetization**

Synonym for *polarized return-to-zero recording*.

**polarized return-to-zero recording (RZ(P))**

A method of *return-to-reference recording* in which *zeros* are represented by magnetization in one sense, *ones* are represented by magnetization in the opposite sense, and the reference condition is the absence of magnetization. Synonymous with *polarized dipole magnetization*.

**Polish notation**

(ISO) Synonym for *prefix notation*.

**polling**

Interrogation of devices for purposes such as to avoid contention, to determine *operational* status, or to determine readiness to send or receive *data*.

**polyphase sort**

An *unbalanced merge sort* in which the distribution of *sorted subsets* is based on a *Fibonacci series*.

**position**

- (1) (ISO) In a *string*, each location that may be occupied by a *character* or *binary element* and that may be identified by a *serial number*.
- (2) See *bit position*, *punch position*, *sign position*.

**positional notation**

(ISO) Synonym for *positional representation system*.

**positional representation**

(ISO) A representation of a *real number* in a *positional representation system*.

**positional representation system**

(ISO) Any *numeration system* in which a *real number* is represented by an *ordered*



*set of characters* in such a way that the value contributed by a character depends upon its position as well as upon its value. Synonymous with positional notation.

**positioning time**

(ISO) The time to mechanically position a *transducer* relative to the *location* of the required *data* on a *storage* medium, e.g., the time required to position a *read-write head* on a *magnetic disk* plus the time required for the data to arrive at the read-write head.

**postfix notation**

- (1) (ISO) A method of forming mathematical expressions in which each *operator* is preceded by its *operands* and indicates the *operation* to be performed on the operands or the intermediate *results* that precede it. Synonymous with reverse Polish notation, suffix notation.
- (2) Contrast with *infix notation*, *prefix notation*.
- (3) See also *parentheses-free notation*.

**posting**

See *event posting*.

**postmortem dump**

(ISO) *Dumping* that is performed at the end of a *run*, usually for purposes of *debugging*, *auditing*, or *documentation*.

**postprocessor**

(ISO) A *computer program* that effects some final computation or organization.

**pragmatics**

(ISO) The relationship of *characters* or groups of characters to their interpretation and use.

**precision**

- (1) (ISO) A measure of the ability to distinguish between nearly equal values.
- (2) The degree of discrimination with which a quantity is stated. For example, a three-digit *numeral* discriminates among 1000 possibilities.
- (3) Contrast with *accuracy*.
- (4) See *double-precision*, *multiple-precision*, *single-precision*, *triple-precision*.

**predefined process**

In *flowcharting*, a *process* that is identified only by name and that is defined elsewhere.

**prefix notation**

- (1) (ISO) A method of forming mathematical *expressions* in which each *operator* precedes its *operands* and indicates the *operation* to be performed on the operands or the intermediate *results* that follow it. Synonymous with Lukasiewicz notation, Polish notation.
- (2) Contrast with *infix notation*, *postfix notation*.
- (3) See also *parentheses-free notation*.

**preprocessor**

(ISO) A *computer program* that effects some preliminary computation or organization.

**pre-read head**

A *read head* placed relative to a second read head so that it may be used to *read* the *data* on a magnetic *track* before the data are read by the second read head.

**preset**

(ISO) To establish an initial condition, such as the control values of a *loop*, or the value to which a *parameter* is to be *bound*.

**preset parameter**

(ISO) A *parameter* that is *bound* when the *computer program* is constructed, when it is *flowcharted*, *coded*, or *compiled*.

**prestore**

- (1) (ISO) To *store*, before a *computer program*, *routine*, or *subroutine* is entered, *data* that are required by the computer program, the routine, or the subroutine.
- (2) Contrast with *initialize*.

**presumptive instruction**

(ISO) An *instruction* that is not an *effective instruction* until it has been modified in a prescribed manner.

**prevarication**

(ISO) Synonym for *irrelevance*.

**preventive maintenance**

- (1) *Maintenance* specifically intended to prevent *faults* from occurring. *Corrective maintenance* and *preventive maintenance* are both performed during *maintenance time*.
- (2) Contrast with *corrective maintenance*.

**preventive maintenance time**

Time, usually scheduled, used to perform *preventive maintenance*.

**print contrast ratio**

- (1) In *optical character recognition*, the ratio obtained by subtracting the reflectance at an inspection area from the maximum reflectance found within a specified distance from that area, and dividing the result by that maximum reflectance.
- (2) Contrast with *print contrast signal*.

**print contrast signal (PCS)**

- (1) In *optical character recognition*, a

measure of the contrast between a printed *character* and the paper on which the character is printed.

- (2) Contrast with *print contrast ratio*.

**print control character**

A *control character* for *print operations* such as line spacing, page ejection, or *carriage return*.

**printed card form**

The layout or format of the printed matter on a card. The printed matter usually describes the purpose of the card and designates the precise location of *card fields*.

**printer**

See *bar printer*, *chain printer*, *character printer*, *drum printer*, *matrix printer*, *on-the-fly printer*, *page printer*.

**print wheel**

A disk in a printing mechanism that provides all *characters* of a *font* at a single printing *position*. Synonymous with *type wheel*.

**priority processing**

A method of *operating* a *computer* in which *computer programs* are *processed* in such a way that the order of operations to be performed is fully determined by a system of priorities.

**privileged instruction**

(ISO) An *instruction* that may be used only by a *supervisory program*.

**problem description**

(ISO) A statement of a problem, perhaps including a description of the method of solving it, the *procedures* and *algorithms*, etc.

**problem-oriented language**

(ISO) A *programming language* that is especially suitable for a given class of problems. *Procedure-oriented languages* such as *FORTRAN*, *ALGOL*; *simulation languages* such as *GPSS*, *SIMSCRIPT*; *list processing languages* such as *LISP*, *IPL-V*; *information retrieval languages*.

**problem time**

In *simulation*, the duration of a *process*, or the length of time between two specified events of a process.

**procedural language**

(ISO) Synonym for *procedure-oriented language*.

**procedure**

- (1) (ISO) The course of action taken for the solution of a problem.
- (2) The description of the course of action taken for the solution of a problem.
- (3) See *inline procedures*.

**procedure-oriented language**

(ISO) A *problem-oriented language* that facilitates the expression of a *procedure* as an explicit *algorithm*, e.g., *FORTRAN*, *ALGOL*, *COBOL*, *PL/I*. Synonymous with procedural language.

**process**

- (1) A course of events occurring according to an intended purpose or effect.
- (2) A *systematic sequence of operations* to produce a specified *result*.
- (3) To perform *operations* on *data*.
- (4) See *input process*, *output process*, *predefined process*.

**processable scored card**

A *scored card* including at least one separable part that can be *processed* after separation.

**process control**

Automatic control of a *process*, in which a *computer* is used for the regulation of usually continuous *operations* or *processes*.

**processing**

See *administrative data processing*, *automatic data processing*, *background processing*, *batch processing*, *business data processing*, *data processing*, *electronic data processing*, *foreground processing*, *integrated data processing*, *list processing*, *multiprocessing*, *parallel processing*, *priority processing*, *real-time processing*, *remote batch processing*, *sequential batch processing*, *serial processing*.

**processing system**

See *data processing system*.

**processing unit**

See *central processing unit*.

**processor**

- (1) In *hardware*, a *data processor*.
- (2) In *software*, a *computer program* that performs functions such as *compiling*, *assembling*, and *translating* for a specific *programming language*.
- (3) See *central processor*, *data processor*, *language processor*, *multiprocessor*.

**product**

(ISO) The *number* or quantity that results from a multiplication.

**production time**

That part of *operating time* that is neither *development time* nor *makeup time*.

**program**

- (1) (ISO) A schedule or plan that specifies actions that may or may not be taken.
- (2) Loosely, a *routine*.

(3) (ISO) To design, write, and test computer programs.

(4) Loosely, to write a routine.

(5) See *assembly program, checking program, compiling program, computer program, control program, diagnostic program, editor program, executive program, input program, library program, macrogenerating program, monitor program, object program, output program, reenterable program, relocatable program, reusable program, self-adapting program, self-organizing program, snapshot program, sort program, source program, supervisory program, target program, trace program, translating program, utility program.*

#### **program block**

In *problem-oriented languages*, a computer program subdivision that serves to group related statements, delimit routines, specify storage allocation, delineate the applicability of labels, or segment parts of the computer program for other purposes.

#### **program development time**

That part of *operating time* that is used for *debugging*.

#### **program execution time**

The interval during which the instructions of an *object program* are executed.

#### **program-generated parameter**

(ISO) A *parameter* that is *bound* during the execution of a computer program. Synonymous with *dynamic parameter*.

#### **program library**

- (1) (ISO) An organized collection of computer programs that are sufficiently documented to allow them to be used by persons other than their authors.
- (2) A collection of available computer programs and routines.

#### **program loader**

See *initial program loader*.

#### **programmed check**

- (1) A check procedure that is a part of a computer program.
- (2) Contrast with *automatic check*.

#### **programmed computer**

(ISO) Synonym for *stored-program computer*.

#### **programmer**

A person who designs, writes, and tests computer programs.

#### **programming**

- (1) (ISO) The designing, writing, and testing of programs.
- (2) See *automatic programming, convex programming, dynamic programming, integer programming, linear programming, macroprogramming, mathematical programming, minimum delay programming, multiprogramming, nonlinear programming, quadratic programming.*

#### **programming flowchart**

(ISO) A *flowchart* representing the sequence of operations in a computer program. Synonymous with *programming flow diagram*.

#### **programming flow diagram**

(ISO) Synonym for *programming flowchart*.

#### **programming language**

(ISO) An *artificial language* established for expressing computer programs.

#### **programming module**

A discrete identifiable set of instructions, usually handled as a unit, by an assembler, a compiler, or a linkage editor, a

*loading routine*, or other type of routine or subroutine.

**programming system**

(ISO) One or more *programming languages* and the necessary *software* for using these languages with particular *automatic data processing* equipment.

**program origin**

See *computer program origin*.

**program parameter**

See *external program parameter*.

**program-sensitive fault**

- (1) A *fault* that occurs as a *result* of some particular *sequence* of *program* steps.
- (2) Contrast with *pattern-sensitive fault*.

**proper subset**

(ISO) Of a *set*, a *subset* that does not include all the *elements* of the *set*.

**protected location**

A *storage location* whose content is protected against accidental alteration, improper alteration, or unauthorized access.

**protection**

- (1) An arrangement for restricting access to or use of a system or part of a *system*.
- (2) See *storage protection*.

**pseudo code**

A *code* that requires *translation* prior to *execution*.

**pseudo-instruction**

(ISO) Deprecated term for *declaration*.

**pseudo-random number sequence**

(ISO) An *ordered set* of *numbers* that has been determined by some defined arith-

metic *process* but is effectively a *random number sequence* for the purpose for which it is required.

**pulse**

- (1) A variation in the value of a quantity, short in relation to the time schedule of interest, the final value being the same as the initial value. Synonymous with *impulse*.
- (2) See *clock pulse*, *synchronization pulse*.

**pulse repetition rate**

The number of *pulses* per *unit* time.

**pulse string**

Synonym for *pulse train*.

**pulse train**

A series of *pulses* having similar characteristics. Synonymous with *pulse string*.

**punch**

- (1) A device for making holes in a *data medium*.
- (2) A perforation, as in a *punched card* or paper tape.
- (3) See *automatic-feed punch*, *card punch*, *calculating punch*, *digit punch*, *eleven punch*, *gang punch*, *hand-feed punch*, *keyboard punch*, *keypunch*, *numeric punch*, *reproducing punch*, *spot punch*, *summary punch*, *twelve punch*, *zone punch*.

**punch card**

- (1) A card into which *hole patterns* can be *punched*.
- (2) See *Hollerith card*.

**punch column**

- (1) A line of *punch positions* parallel to the *Y-datum line* of a card.
- (2) A line of *punch positions* along a card column.



**punched card**

- (1) A card *punched* with *hole patterns*.
- (2) See *Hollerith card*.

**punched card reader**

Synonym for *card reader*.

**punched tape**

Synonym for *perforated tape*.

**punching**

See *interstage punching*, *multiple punching*.

**punching position**

(ISO) Synonym for *punch position*.

**punching station**

The place in a *card track* where a *punch card* is *punched*.

**punch position**

(ISO) A defined *location* on a card or tape where a hole may be *punched* to record *data*. Synonymous with *code position*, *punching position*.

**punch row**

A line of *punch positions* along a *card row*.

**punctuation symbol**

Synonym for *delimiter*.

**pure binary numeration system**

(ISO) The *fixed-radix numeration system* that uses the *binary digits* and the *radix* 2, e.g., in this *numeration system*, the *numeral* 110.01 represents the number six and a quarter, i.e.,  $1 \times 2^2 + 1 \times 2^1 + 1$

$\times 2^{-2}$ . Synonymous with *binary numeration system*.

**pushdown list**

(ISO) A *list* that is constructed and maintained so that the next *item* to be retrieved is the most recently *stored* item in the list, i.e., last-in-first-out (LIFO). Synonymous with *stack*.

**pushdown storage**

(ISO) A *storage device* that handles *data* in such a way that the next *item* to be retrieved is the most recently *stored* item still in the storage device, i.e., last-in-first-out (LIFO). Synonymous with *pushdown store*.

**pushdown store**

(ISO) Synonym for *pushdown storage*.

**pushup list**

(ISO) A *list* that is constructed and maintained so that the next *item* to be retrieved is the earliest *stored* item still in the list, i.e., first-in-first-out (FIFO).

**pushup storage**

(ISO) A *storage device* that handles *data* in such a way that the next *item* to be retrieved is the earliest *stored* item still in the storage device, i.e., first-in-first-out (FIFO). Synonymous with *pushup store*.

**pushup store**

(ISO) Synonym for *pushup storage*.

## Q

**quadratic programming**

- (1) (ISO) In *operations research*, a particular case of *nonlinear programming* in which the *function* to be maximized or minimized is a quadratic function and the constraints are linear functions.
- (2) Contrast with *convex programming*, *dynamic programming*, *integer programming*, *linear programming*, *mathematical programming*, *nonlinear programming*.

**quadruple-length register**

(ISO) Four *registers* that function as a single register. Each register may be individually accessed. Synonymous with quadruple register.

**quadruple register**

(ISO) Synonym for *quadruple-length register*.

**qualified name**

(ISO) A *data name* explicitly accompanied by a specification of the class to which it belongs in a specified classification system.

**quantization**

The subdivision of the *range* of values of a *variable* into a finite number of nonoverlapping, but not necessarily equal, subranges or intervals each of which is represented by an assigned value within the subrange. For example, a person's age is *quantized* for most purposes with a *quantum* of one year.

**quantize**

(ISO) To divide the *range* of a *variable* into a finite number of non-overlapping intervals, that are not necessarily equal, and to designate each interval by an assigned value within that interval.

**quantum**

A subrange in *quantization*.

**quaternary operator**

(ISO) An *operator* that requires exactly four *operands*.

**quarter squares multiplier**

An *analog multiplier* unit that uses the identity  $xy = \frac{1}{4}[(x+y)^2 - (x-y)^2]$ .

**quartet**

(ISO) A *byte* composed of four *binary elements*. Synonymous with four-bit byte.

**queue**

See *double-ended queue*.

**queued access method**

Any access method that synchronizes the transfer of data between the *computer program* using the access method and *input-output* devices, thereby minimizing delays for input-output operations.

**quiescing**

The process of bringing a device or a system to a halt by rejection of new requests for work.

**quinary**

See *biquinary code*.

**quintet**

(ISO) A *byte* composed of five *binary elements*. Synonymous with five-bit byte.

**quotient**

- (1) (ISO) The *number* or quantity that is the value of the *dividend* divided by the value of the *divisor* and that is one of the *results* of a division operation.
- (2) Contrast with *remainder*.

## R

**radial transfer**

- (1) (ISO) The process of *transmitting data* between a peripheral *unit* and a unit of equipment that is more central than that peripheral unit. Synonymous with input-output (1).
- (2) Synonymous with input process (2), output process.

**radix**

- (1) (ISO) Of a *digit place* in a *radix numeration system*, the positive *integer* by which the *weight* of the digit place is multiplied to obtain the weight of the digit place with the next higher weight, e.g., in the *decimal numeration system* the radix of each digit place is 10, in a *biquinary code* the radix of each fives position is 2.
- (2) (ISO) Deprecated term for *base*.
- (3) See *mixed-radix numeration system*.

**radix complement**

- (1) (ISO) A *complement* obtained by subtracting each *digit* of the given *number* from the number that is one less than the *radix* of that *digit place*, then adding one to the least *significant digit* of the *result* and executing any *carries* required, e.g., 830 is the *tens complement*, i.e., the radix complement of 170 in the *decimal numeration system* using three digits. Synonymous with noughts complement.
- (2) See *dimished radix complement*.

**radix-minus-one complement**

(ISO) Synonym for *diminished radix complement*.

**radix notation**

(ISO) Synonym for *radix numeration system*.

**radix numeration system**

(ISO) A *positional representation system* in which the ratio of the *weight* of any one *digit place* to the weight of the digit place with the next lower weight is a positive *integer*. The permissible values of the *character* in any digit place range from *zero* to one less than the *radix* of that digit place. Synonymous with radix notation.

**radix point**

(ISO) In a representation of a *number* expressed in a *radix numeration system*, the location of the separation of the *characters* associated with the integral part from those associated with the fractional part.

**random access**

- (1) In *COBOL*, an *access mode* in which specific *logical records* are obtained from or placed into a *mass storage file* in a nonsequential manner.
- (2) (ISO) Synonym for *direct access*.

**random access storage**

(ISO) Synonym for *direct access storage*.

**random number**

- (1) (ISO) A *number* selected from a known *set* of numbers in such a manner that the probability of occurrence of each number in the set is predetermined.
- (2) A *number* obtained by chance.
- (3) One of a *sequence* of *numbers* considered appropriate for satisfying certain statistical tests or believed to be free from conditions which might *bias* the result of a calculation.

**random number sequence**

- (1) (ISO) An *ordered set* of *numbers* each of which may not be predicted only from a knowledge of its predecessors.

- (2) See also *pseudo-random number sequence*.

**random-walk method**

In *operations research*, a variance-reducing method of problem analysis in which experimentation with probabilistic *variables* is traced to determine *results* of a significant nature.

**range**

- (1) (ISO) The *set* of values that a quantity or *function* may take.  
(2) The difference between the highest and lowest value that a quantity or *function* may assume.  
(3) (ISO) Deprecated term for *span*.  
(4) See *error range*.

**rank**

(ISO) Synonym for *level number*.

**rate**

See *average information rate*, *average transinformation rate*, *data signalling rate*, *pulse repetition rate*.

**ratio**

See *error ratio*, *print contrast ratio*, *read-around ratio*.

**rational number**

(ISO) A *real number* that is the *quotient* of an *integer* divided by an integer other than zero.

**read**

- (1) (ISO) To acquire or to interpret *data* from a *storage device*, from a *data medium*, or from another source.  
(2) See *destructive read*, *nondestructive read*.

**read-around ratio**

The number of times a specific spot, *digit*, or *location* in *electrostatic storage* may be

consulted before spillover of electrons causes a loss of *data stored* in surrounding spots. The surrounding data must be restored before the deterioration results in any loss of data.

**read cycle time**

(ISO) The minimum time interval between the starts of successive *read cycles* of a device that has separate *reading* and *writing* cycles.

**reader**

- (1) In *micrographics*, a device that enlarges *microimages* for viewing.  
(2) See *card reader*, *character reader*, *perforated-tape reader*.

**reader-printer**

In *micrographics*, a device that performs the functions of a *reader* and a printer to produce hard copy enlargements of selected *microimages*.

**read head**

A *magnetic head* that only reads.

**reading**

(ISO) The acquisition or interpretation of *data* from a *storage device*, from a *data medium*, or from another source.

**reading station**

Synonym for *read station*.

**read-only memory (ROM)**

(ISO) Synonym for *fixed storage*.

**read-only storage**

(ISO) Synonym for *fixed storage*, *permanent storage*.

**read-out device**

(ISO) Synonym for *character display device*.

**read station**

(ISO) The place in a *card* path where the *data* on a *punched card* are *read*. Synonymous with *reading station*, *sensing station*.

**read/write head**

(ISO) Synonym for *magnetic head*.

**real address**

The *address* of an actual *storage location* in *real storage*.

**real number**

(ISO) A *number* that may be represented by a finite or infinite *numeral* in a *fixed-radix numeration system*.

**real storage**

The *execution space* in a *virtual storage system* that is directly controlled by a *central processing unit*.

**real time**

- (1) Pertaining to the actual time during which a physical *process* transpires.
- (2) Pertaining to the performance of a computation during the actual time that the related physical *process* transpires, in order that *results* of the computation can be used in guiding the physical process.

**real-time control**

(ISO) The control of a *process* by *real-time processing*.

**real-time input**

(ISO) *Input data* received into a *data processing system* within time limits that are determined by the requirements of some other *system* or at instants that are so determined.

**real-time operation**

(ISO) Synonym for *real-time processing* (1).

**real-time output**

(ISO) *Output data* delivered from a *data processing system* within time limits that are determined by the requirements of some other *system* or at instants that are so determined.

**real-time processing**

- (1) (ISO) A mode of *operation* of a *data processing system* when performing *real-time jobs*. Synonymous with *real-time operation*.
- (2) (ISO) The manipulation of *data* that are required or generated by some *process* while the process is in *operation*; usually the *results* are used to influence the process, and perhaps related processes, while it is occurring.

**real-time simulation**

The operation of a *simulator* such that the *time scale factor* is equal to one for a physical time specified by the system being *simulated* and by the corresponding *computer time* of the simulator.

**real-time working**

(ISO) Deprecated term for *real-time processing*.

**receiving perforator**

A *punch* that converts coded electrical *pulse patterns* into *hole patterns* or cuts in *perforated tape*. Synonymous with *tape punch*.

**recognition**

See *character recognition*, *magnetic ink character recognition*, *optical character recognition*, *pattern recognition*.

**record**

- (1) (ISO) A collection of related *data* or



words treated as a *unit*, e.g., in stock control, each invoice could constitute one record.

- (2) See *logical record*, *variable-length record*.

#### **record gap**

(ISO) Deprecated term for *interblock gap*.

#### **recording**

See *double-pulse recording*, *electron-beam recording*, *magnetic recording*, *non-polarized return-to-zero recording*, *non-return-to-change recording*, *non-return-to-reference recording*, *non-return-to-zero change-on-ones recording*, *non-return-to-zero (change) recording*, *non-return-to-zero recording*, *polarized return-to-zero recording*, *return-to-reference recording*.

#### **recording area**

(ISO) Synonym for *film frame*.

#### **recording density**

The number of *bits* in a single linear track measured per *unit* of length of the recording medium.

#### **record layout**

(ISO) The arrangement and structure of data or words in a *record* including the order and size of the components of the record.

#### **record length**

(ISO) The number of words or characters forming a *record*.

#### **record separator character (RS)**

(ISO) The *information separator* intended to identify a logical boundary between records.

#### **recursive function**

(ISO) A function whose values are *natural numbers* that are derived from natural

numbers by substitution formulae in which the function is an *operand*.

#### **recursively defined sequence**

(ISO) A series of terms in which each term after the first is determined by an *operation* in which the *operands* are some or all of the preceding terms.

#### **recursive routine**

(ISO) A *routine* that may be used as a routine of itself, *calling* itself directly or being called by another routine, one that it itself has called. The use of a recursive routine or *computer program* usually requires the keeping of records of the status of its unfinished uses in, for example, a *pushdown list*.

#### **recursive subroutine**

(ISO) A *subroutine* that may be used as a subroutine of itself, *calling* itself directly or being called by another subroutine, one that it itself has called. The use of a recursive subroutine or *computer program* usually requires the keeping of records of the status of its unfinished uses in, for example, a *pushdown list*.

#### **reduction**

(1) (ISO) In *micrographics*, a measure of the number of times the linear dimensions of an object are reduced when photographed, expressed as 16x, 24x, etc.

- (2) See *data reduction*.

#### **redundancy**

(1) (ISO) In *information theory*, the amount  $R$  by which the *decision content*  $H_0$  exceeds the *entropy*  $H$ ; in mathematical notation:

$$R = H_0 - H$$

Usually, *messages* can be represented with fewer *characters* by using suitable *codes*; the redundancy may be considered as a measure of the decrease of length of the messages thus achieved.

(2) See *relative redundancy*.

#### redundancy check bit

A *check bit* that is derived from a *character* and appended to the character.

#### redundancy check character

(1) A *check character* that is derived from a *record* and appended to the record.

(2) See *cyclic redundancy check character*.

#### reel

(ISO) A cylinder with flanges on which tape or film may be wound.

#### reenterable program

(ISO) Synonym for *reentrant program*.

#### reenterable routine

(ISO) Synonym for *reentrant routine*.

#### reenterable subroutine

(ISO) Synonym for *reentrant subroutine*.

#### reentrant program

(ISO) A *computer program* that may be entered repeatedly and may be entered before prior *executions* of the same computer program have been completed, subject to the requirement that neither its *external program parameters* nor any *instructions* are modified during its execution. A reentrant program may be used by more than one computer program

simultaneously. Synonymous with reenterable program.

#### reentrant routine

(ISO) A *routine* that may be entered repeatedly and may be entered before prior *executions* of the same routine have been completed, subject to the requirement that neither its *external program parameters* nor any *instructions* are modified during its execution. A reentrant routine may be used by more than one *computer program* simultaneously. Synonymous with reenterable routine.

#### reentrant subroutine

(ISO) A *subroutine* that may be entered repeatedly and may be entered before prior *executions* of the same subroutine have been completed, subject to the requirement that neither its *external program parameters* nor any *instructions* are modified during its execution. A reentrant subroutine may be used by more than one *computer program* simultaneously. Synonymous with reenterable subroutine.

#### reentry point

(ISO) The *address* or the *label* of the *instruction* at which the *computer program* that called a *subroutine* is reentered from the subroutine.

#### reference edge

(1) (ISO) That edge of a *data medium* used to establish specifications or measurements in or on the data medium. Synonymous with guide edge.

(2) See *document reference edge*.

#### reflected binary code

Synonym for *gray code*.

#### regeneration

See *signal regeneration*.

**regenerative track**

Part of a *track* on a *magnetic drum* or *magnetic disk* used in conjunction with a *read head* and a *write head* that are connected to *function* as a *circulating storage*.  
Synonymous with *revolver track*.

**register**

- (1) (ISO) In a *computer*, a *storage device*, usually intended for some special purpose, capable of *storing* a specified amount of *data* such as a *bit* or a *word*.
- (2) See *address register*, *base address register*, *base register*, *circulating register*, *clock register*, *double-length register*, *floating-point register*, *general-purpose register*, *index register*, *instruction address register*, *instruction register*, *n-tuple-length register*, *quadruple-length register*, *return code register*, *sequence control register*, *shift register*, *time register*, *triple-length register*.

**registration**

The accurate *positioning* of an entity relative to a reference.

**relative address**

(ISO) An *address* expressed as a *difference* with respect to a *base address*.

**relative addressing**

(ISO) A method of *addressing* in which the *address part* of an *instruction* contains a *relative address*.

**relative coding**

*Coding* that uses machine *instructions* with *relative addresses*.

**relative error**

(ISO) The ratio of an *absolute error* to the true, specified, or theoretically correct value of the quantity that is in *error*.

**relative redundancy**

(ISO) In *information theory*, the ratio *r* of the redundancy *R* to the decision content  $H_o$ ; in mathematical notation:

$$r = \frac{R}{H_o} = \frac{H_o - H}{H_o}$$

**reliability**

(ISO) The ability of a *functional device* to perform its intended *function* under stated conditions for a stated period of time.

**relocatable address**

(ISO) An *address* that is adjusted when the *computer program* containing it is *relocated*.

**relocatable program**

(ISO) A *computer program* that is in such a form that it may be *relocated*.

**relocate**

(ISO) To move a *computer program* or part of a *computer program*, and to adjust the necessary *address references* so that the *computer program* can be *executed* after being moved.

**relocating loader**

A *loader* that adjusts *addresses*, relative to the *assembled origin*, by the *relocation factor*.

**relocation**

See *dynamic relocation*.

**relocation dictionary**

The part of an *object module* or *load module* that identifies all *addresses* that must be adjusted when a *relocation* occurs.

**relocation factor**

The algebraic *difference* between the *assembled origin* and the *loaded origin* of a computer program.

**remainder**

- (1) (ISO) In a division operation, the number or quantity that is the undivided part of the *dividend*, having an absolute value less than the absolute value of the *divisor*, and that is one of the *results* of a division operation.
- (2) Contrast with *quotient*.

**remote access**

Pertaining to communication with a *data processing* facility through a *data link*.

**remote batch entry**

(ISO) Submission of batches of *jobs* through an *input-output unit* that has access to a *computer* through a *data link*.

**remote batch processing**

(ISO) *Batch processing* in which *input-output units* have access to a *computer* through a *data link*.

**remote job entry (RJE)**

(ISO) Submission of *jobs* through an *input unit* that has access to a *computer* through a *data link*.

**remote station**

*Data terminal equipment* for communicating with a *data processing system* through a *data link*.

**re-order**

(ISO) Deprecated term for *order (1)*.

**repeated selection sort**

- (1) A *selection sort* in which the set of *items* is divided into *subsets* and one item, that fits specified criteria, from each subset is selected to form a se-

cond level subset. A *selection sort* is applied to this second level subset, the selected item in this second level subset is appended to the sorted set and is replaced by the next eligible item in the original subset, and the process repeated until all items are in the sorted set.

- (2) See also *tournament sort*.

**reperforator**

*Receiving perforator*.

**repertoire**

See *instruction repertoire*.

**repetition instruction**

An *instruction* that causes one or more instructions to be *executed* an indicated number of times.

**repetitive addressing**

(ISO) A method of *implied addressing*, applicable only to *zero-address instructions*, in which the *operation part* of an *instruction* implicitly addresses the *operands* of the last instruction executed.

**representation**

See *analog representation*, *coded representation*, *digital representation*, *discrete representation*, *floating-point representation*, *incremental representation*, *linear representation*, *number representation*, *numeric representation*, *variable-point representation*.

**representation system**

See *fixed-point representation system*, *floating-point representation system*, *number representation system*, *positional representation system*, *variable-point representation system*.

**reproduce**

Synonym for *duplicate*.

**reproducer**

(ISO) Synonym for *reproducing punch*.

**reproducing punch**

(ISO) A *punched card* device that prepares one punched card from another punched card *copying* all or part of the *data* from the punched card that is *read*.  
Synonymous with *reproducer*.

**rerun**

- (1) (ISO) A repeat of a machine *run* from its beginning, usually made desirable or necessary by a false start, by an *interruption*, or by a change.  
(2) (ISO) To perform a rerun.

**rerun point**

That *location*, in the *sequence* of *instructions* in a *computer program*, at which all *information* pertinent to the *rerunning* of the program is available.

**rescue point**

(ISO) Synonym for *restart point*.

**reserved word**

(ISO) A *word* of a *source language* whose meaning is fixed by the particular rules of that language and cannot be altered for the convenience of any one *computer program* expressed in the source language; computer programs expressed in the source language may also be prohibited from using such words in other contexts in the computer program. For example, SINE may be a reserved word to call a *subroutine* for computing the sine function; in COBOL, the COBOL words.

**reset**

- (1) (ISO) To cause a *counter* to take the state corresponding to a specified initial number.  
(2) (ISO) To restore a *storage device* to a

prescribed initial state, not necessarily that denoting zero.

- (3) Contrast with *set*.

**residual error ratio**

The *error ratio* remaining after attempts at correction.

**residue check**

A validation check in which an *operand* is divided by a *number* *n* to generate a *remainder* that is then used for *checking*.  
Synonymous with modulo-*n* check.

**resolver**

A device whose *input* is a *vector* quantity and whose *outputs* are components of the vector.

**response**

See *spectral response*.

**response duration**

(ISO) The time duration between the start of a pulse which influences a *storage cell* and the end of the resulting response of that storage cell.

**response time**

(ISO) The elapsed time between the end of an enquiry or demand on a *data processing system* and the beginning of the response, e.g., the length of time between the end of an enquiry and the *display* of the first *character* of the response at a *user terminal*.

**restart**

- (1) (ISO) The resumption of the *execution* of a *computer program* using the *data* recorded at a *checkpoint*.  
(2) (ISO) To perform a restart.

**restart condition**

(ISO) In the *execution* of a *computer program*, a condition that can be re-establish-



lished and that permits a *restart* of the computer program.

**restart instruction**

(ISO) An *instruction* in a *computer program* at which the computer program may be *restarted*.

**restart point**

- (1) (ISO) A place in a *computer program* at which its *execution* may be *restarted*; in particular, the *address* of a *restart instruction*. Synonymous with *rescue point*.
- (2) (ISO) Deprecated term for *restart condition*.

**result**

(ISO) An entity produced by the performance of an *operation*.

**retrieval**

See *information retrieval*.

**retrieval code**

In *micrographics*, a code used for manual or automatic retrieval of *microimages*.

**return**

- (1) (ISO) Within a *subroutine*, to *bind* a *variable* in the *computer program* that called the subroutine.
- (2) (ISO) Within a *subroutine*, to effect a *link* to the *computer program* that called the subroutine.
- (3) See *carriage return*.

**return character**

See *carriage return character*.

**return code**

A *code* used to influence the *execution* of succeeding *instructions*.

**return code register**

A *register* used to store a *return code*.

**return-to-reference recording**

(ISO) The *magnetic recording* of *binary characters* in which the pattern of magnetization used to represent zeros and ones occupies only part of the *storage cell*, the remainder of the cell being magnetized to a reference condition.

**reusable program**

(ISO) A *computer program* that may be *loaded* once and *executed* repeatedly, subject to the requirements that any *instructions* that are modified during its *execution* are returned to their initial states and that its *external program parameters* are preserved unchanged.

**reusable routine**

(ISO) A *routine* that may be *loaded* once and *executed* repeatedly, subject to the requirements that any *instructions* that are modified during its *execution* are returned to their initial states and that its *external program parameters* are preserved unchanged.

**reverse direction flow**

In *flowcharting*, a flow in a direction other than left to right or top to bottom.

**reverse Polish notation**

(ISO) Synonym for *postfix notation*.

**reversible counter**

(ISO) A device whose state represents a number and that, on receipt of an appropriate *signal*, causes the number represented to be increased or decreased by unity or by an arbitrary constant; the device is usually capable of bringing the number represented to a specific value, such as zero.

**revolver track**

Synonym for *regenerative track*.

**right-justify**

- (1) (ISO) To *shift* the contents of a *register*, if necessary, so that the *character* at the right-hand end of the *data* that have been *read* or *loaded* into the register is at a specified position in the register.
- (2) (ISO) To control the positions of *characters* on a page so that the right-hand margin of the printing is regular.
- (3) To align *characters* horizontally so that the right-most character of a *string* is in a specified position.

**RJE**

(ISO) *Remote job entry*

**rollback**

A *programmed* return to a prior *check-point*.

**roll-in**

To restore in *main storage*, *data* or one or more *computer programs* that were previously *rolled out*.

**roll-out**

To transfer *data* or one or more *computer programs* from *main storage* to *auxiliary storage* for the purpose of freeing main storage for another use.

**ROM**

(ISO) *Read-only memory*.

**round**

- (1) (ISO) To delete or omit one or more of the least significant *digits* in a *positional representation* and to adjust the part retained in accordance with some specified rule. The purpose of rounding is usually to limit the *precision* of the *numeral* or to reduce the number of *characters* in the numeral, or to do both. The most common forms of

rounding are *rounding down*, *rounding up*, and *rounding off*.

- (2) Contrast with *truncation*.

**round down**

(ISO) To *round*, making no adjustment to the part of the *numeral* that is retained. If a numeral is rounded down, its absolute value is not increased. Rounding down is a form of *truncation*.

**rounding error**

(ISO) An *error* due to *rounding*.

**round off**

- (1) (ISO) To *round*, adjusting the part of the *numeral* that is retained by adding 1 to the least significant of its *digits*, and executing any necessary *carries* if and only if the most significant of the digits deleted was equal to or greater than half the *radix* of its *digit place*.
- (2) (ISO) To *round*, adjusting the part of the *numeral* retained by adding 1 to the least significant of its *digits*, and executing any necessary *carries*, if (a) the most significant of the digits deleted was greater than half the *radix* of that *digit place*, or (b) the most significant of the digits deleted was equal to half the radix and one or more of the following digits were greater than zero, or (c) the most significant of the digits deleted was equal to half the radix, all the following digits were equal to zero, and the least significant of the digits retained was odd. In (c), even may be substituted for odd.

**round up**

(ISO) To *round*, adjusting the part of the *numeral* that is retained by adding 1 to the least significant of its *digits*, and executing any necessary *carries* if and only if one or more non-zero digits have been

deleted. If a numeral is rounded up, its absolute value is not decreased.

**routine**

- (1) (ISO) An *ordered set of instructions* that may have some general or frequent use.
- (2) See *dump routine, input routine, library routine, output routine, recursive routine, reentrant routine, reusable routine, subroutine, supervisory routine, tracing routine, utility routine.*

**row**

- (1) A horizontal arrangement of *characters* or other expressions.
- (2) Contrast with *column*.
- (3) See *card row, mark-sense row, punch row.*

**row binary**

- (1) Pertaining to the *binary* representation of *data* on cards in which the *significances* of *punch positions* are assigned along *card rows*. For example, each row in an 80-column card may be used to represent 80 consecutive *binary digits*.
- (2) Contrast with *column binary*.

**row pitch**

The distance between corresponding points

of adjacent *rows* measured along a *track*.  
Synonymous with *array pitch*.

**RPG**

Report program generator.

**RS**

The *record separator character*.

**run**

- (1) (ISO) A single performance of one or more *jobs*.
- (2) A single, continuous performance of a *computer program* or *routine*.

**run duration**

(ISO) Synonym for *running time*.

**running time**

(ISO) The elapsed time taken for the *execution* of a *computer program*.  
Synonymous with *run duration*.

**RZ(NP)**

(ISO) *Non-polarized return-to-zero recording*.

**RZ(P)**

(ISO) *Polarized return-to-zero recording*.

## S

**sample**

(ISO) To obtain the values of a *function* for regularly or irregularly spaced distinct values of an independent *variable*.

**sampling**

- (1) Obtaining the values of a *function* for regularly or irregularly spaced distinct values of an independent *variable*.
- (2) In statistics, obtaining a sample from a population.

**save area**

An area of *main storage* in which the contents of *registers* are saved.

**scalar**

- (1) (ISO) A quantity characterized by a single number.
- (2) Contrast with *vector*.

**scale**

- (1) (ISO) To change the representation of a quantity, expressing it in other units, so that its *range* is brought within a specified range.
- (2) To adjust the representation of a quantity by a factor in order to bring its *range* within prescribed limits.

**scale factor**

- (1) (ISO) A *number* used as a *multiplier* in *scaling*.
- (2) See *time scale factor*.

**scan**

To examine *sequentially*, part by part.

**scanner**

- (1) (ISO) A device that examines a spatial pattern one part after another, and generates *analog* or *digital signals* corresponding to the pattern. Scanners are often used in *mark sensing*,

*pattern recognition*, or *character recognition*.

- (2) See *flying spot scanner*, *optical scanner*.

**scheduled maintenance**

(ISO) *Maintenance* carried out in accordance with an established schedule.

**scheduler**

A *computer program* designed to perform *functions* such as scheduling, initiation, and termination of *jobs*.

**scored card**

- (1) A special card that contains one or more scored lines to facilitate precise folding or separation of certain parts of the card.
- (2) See *processable scored card*.

**search**

- (1) (ISO) The examination of a *set* of *items* for one or more having a given property.
- (2) (ISO) To examine a *set* of *items* for one or more having a given property.
- (3) See *binary search*, *chaining search*, *dichotomizing search*, *Fibonacci search*.

**search cycle**

(ISO) The part of a *search* that is repeated for each *item*, normally consisting of locating the item and carrying out a *comparison*.

**search key**

(ISO) In the conduct of a *search*, the *data* to be compared to specified parts of each *item*.

**section**

(ISO) Deprecated term for *segment*.

**sector**

(ISO) A part of a *track* or *band* on a

*magnetic drum, a magnetic disk, or a disk pack.*

#### seek

- (1) To selectively position the access mechanism of a *direct access* device.
- (2) (ISO) Deprecated term for *search, search cycle*.

#### segment

- (1) (ISO) A self-contained portion of a *computer program* that may be executed without the entire computer program necessarily being maintained in *internal storage* at any one time.
- (2) (ISO) To divide a *computer program* into segments.

#### selection check

A *check* that verifies the choice of devices, such as *registers*, in the *execution* of an *instruction*.

#### selection sort

- (1) A *sort* in which the *items* in a *set* are examined to find an item that fits specified criteria; this item is appended to the sorted set and removed from further consideration, and the process repeated until all items are in the sorted set.
- (2) See *repeated selection sort*.

#### selective dump

(ISO) The *dumping* of the contents of one or more specified *storage* areas.

#### self-adapting computer

(ISO) A *computer* that has the ability to change its performance characteristics in response to its environment.

#### self-adapting program

(ISO) A *computer program* that has the ability to change its performance characteristics in response to its environment.

#### self-checking code

Synonym for *error detecting code*.

#### self-organizing computer

(ISO) A *computer* that has the ability to make rearrangements in its internal structure.

#### self-organizing program

(ISO) A *computer program* that has the ability to make rearrangements in its internal structure.

#### self-relative address

(ISO) A *relative address* that uses as *base address* the *address* of the *instruction* in which it appears.

#### self-relative addressing

(ISO) A method of *addressing* in which the *address part* of an *instruction* contains a *self-relative address*.

#### semantics

- (1) (ISO) The relationships of *characters* or groups of characters to their meanings, independent of the manner of their interpretation and use.
- (2) The relationships between *symbols* and their meanings.

#### sensing

See *mark sensing*.

#### sensing station

(ISO) Synonym for *read station*.

#### sentinel

Synonym for *flag*.

#### separating character

(ISO) Synonym for *information separator*.

#### separator

- (1) Synonym for *delimiter*.
- (2) See *information separator*.



- (3) See also *file separator character, group separator character, record separator character, unit separator character*.

### septet

(ISO) A *byte* composed of seven *binary elements*. Synonymous with seven-bit byte.

### sequence

- (1) (ISO) A series of *items* that have been sequenced.
- (2) An arrangement of *items* according to a specified set of rules, e.g., items arranged alphabetically, numerically, or chronologically.
- (3) (ISO) Deprecated term for *order*.
- (4) (ISO) Synonym for *collating sequence*.
- (5) See *calling sequence, collating sequence, pseudo-random number sequence, random number sequence, recursively defined sequence*.
- (6) Contrast with *order*.

### sequence-by-merging

(ISO) To *sequence* by repeated splitting and *merging*.

### sequence control register

(ISO) Synonym for *instruction address register*.

### sequencing key

Synonym for *sort key*.

### sequential

- (1) Pertaining to the occurrence of events in time *sequence*, with no simultaneity or overlap of events.
- (2) Contrast with *consecutive*.
- (3) See also *concurrent, simultaneous*.

### sequential batch processing

A mode of operating a *computer* in which a *run* must be completed before another run can be started.

### sequential circuit

A *logic device* whose *output* values, at a given instant, depend upon its *input* values and internal state at that instant, and whose internal state depends upon the immediately preceding input values and the preceding internal state. A sequential circuit can assume a finite number of internal states and may therefore be regarded as a finite automaton.

### sequential computer

A *computer* in which events occur in time *sequence*, with little or no simultaneity or overlap of events.

### sequential control

(ISO) A mode of *computer operation* in which *instructions* are *executed* in an implicitly defined *sequence* until a different sequence is explicitly initiated by a *jump instruction*.

### sequential logic element

- (1) A device having at least one *output channel* and one or more *input channels*, all characterized by *discrete* states, such that the state of each output channel is determined by the previous states of the input channels.
- (2) Contrast with *combinational logic element*.

### sequential operation

(ISO) A mode of *operation* in which two or more operations are performed one after another. Synonymous with consecutive operation.

### serial

- (1) (ISO) Pertaining to the *sequential* performance of two or more activities in a single device. In English, the modifiers *serial* and *parallel* usually refer to devices, as opposed to se-

quential and consecutive, which refer to processes.

- (2) Pertaining to the *sequential* or *consecutive* occurrence of two or more related activities in a single device or *channel*.
- (3) Pertaining to the *sequential processing* of the individual parts of a whole, such as the *bits* of a *character* or the characters of a *word*, using the same facilities for successive parts.
- (4) Contrast with *parallel*.

#### serial access

- (1) (ISO) The facility to obtain *data* from a *storage device* or to enter data into a storage device in such a way that the process depends on the location of that data and on a reference to data previously accessed.
- (2) Pertaining to the *sequential* or *consecutive transmission* of data to or from *storage*.
- (3) Contrast with *direct access*.

#### serial access storage

(ISO) A *storage* in which the *access time* is dependent upon the *location* of the *data*.

#### serial adder

(ISO) A *digital adder* in which addition is performed by adding, *digit place* after *digit place*, the corresponding *digits* of the *operands*.

#### serial addition

(ISO) Addition that is performed by adding, *digit place* after *digit place*, the corresponding *digits* of the *operands*.

#### serial computer

- (1) A *computer* having a single *arithmetic and logic unit*.
- (2) A *computer* some specified characteristic of which is *serial*, e.g., a computer

that manipulates all *bits* of a *word* serially.

- (3) Contrast with *parallel computer*.

#### serializer

(ISO) A device that *converts* a space distribution of *simultaneous* states representing *data* into a corresponding time *sequence* of states. Synonymous with *dynamicizer*.

#### serial number

(ISO) An *integer* denoting the *position* of an *item* in a series.

#### serial operation

- (1) Pertaining to the *sequential* or *consecutive execution* of two or more *operations* in a single device such as an *arithmetic* or *logic unit*.
- (2) (ISO) Deprecated term for *sequential operations*.
- (3) Contrast with *parallel operation*.

#### serial processing

- (1) Pertaining to the *sequential* or *consecutive execution* of two or more *processes* in a single device such as a *channel* or *processing unit*.
- (2) Contrast with *parallel processing*.

#### serial sort

A *sort* that requires only *sequential* access to the *items* in a *set*. A serial sort can be performed using only *serial access storage devices*.

#### serial transmission

- (1) In *data communication*, *transmission* at successive intervals of *signal elements* constituting the same telegraph or *data* signal. The *sequential* elements may be transmitted with or without interruption, provided that they are not transmitted *simultaneous-*

ly. For example, telegraph transmission by a time divided *channel*.

- (2) Contrast with *parallel transmission*.

**service program**

(ISO) Synonym for *utility program*.

**service routine**

(ISO) Synonym for *utility routine*.

**servomechanism**

- (1) An *automatic* device that uses feedback to govern the physical position of an element.
- (2) A feedback control system in which at least one of the system *signals* represents mechanical motion.

**set**

- (1) (ISO) A finite or infinite number of objects of any kind, of entities, or of concepts, that have a given property or properties in common.
- (2) (ISO) To cause a *counter* to take the state corresponding to a specified *number*. Contrast with *reset* (1).
- (3) (ISO) To place a *storage device* into a specified state, usually other than that denoting zero. Contrast with *reset* (2).
- (4) See *alphabetic character set, alphabetic coded character set, alphanumeric character set, alphanumeric coded character set, card set, character set, coded character set, code set, empty set, instruction set, machine instruction set, numeric character set, numeric coded character set, universal set*.

**setup**

- (1) (ISO) In a *computer* which consists of an assembly of individual computing *units*, the arrangement of interconnections between the units, and the adjustments needed for the computer to operate upon a given problem.

- (2) An arrangement of *data* or devices to solve a particular problem.

**setup diagram**

(ISO) A diagram specifying a given *computer setup*.

**seven-bit byte**

(ISO) Synonym for *septet*.

**sexadecimal**

- (1) (ISO) Pertaining to a selection, choice, or condition that has sixteen possible different values or states.
- (2) (ISO) Pertaining to a *fixed-radix numeration system* having a *radix* of sixteen. Synonymous with hexadecimal.

**sextet**

(ISO) A *byte* composed of six *binary elements*. Synonymous with six-bit byte.

**Shannon**

(ISO) In *information theory*, a unit of logarithmic measures of information equal to the *decision content* of a *set* of two mutually exclusive *events* expressed by the logarithm to base two, e.g., the decision content of a *character set* of eight characters equals three Shannons. Synonymous with information content binary unit.

**Sheffer stroke**

Synonym for *NAND*.

**shift**

- (1) (ISO) The concerted movement of some or all of the *characters* of a *word* each by the same number of character places in the direction of a specified end of the word.
- (2) See *arithmetic shift, end-around shift, logical shift*.

**shift-in character (SI)**

(ISO) A *code extension character*, used to

terminate a *sequence* that has been introduced by the *shift-out character*, that makes effective the *graphic characters* of the standard *character set*.

#### shift-out character (SO)

(ISO) A *code extension character* that substitutes for the *graphic characters* of the standard *character set* an alternative set of *graphic characters* upon which agreement has been reached or that has been designated using *code extension procedures*.

#### shift register

(ISO) A *register* in which *shifts* are performed.

#### short card

A *special-purpose paper card* that is shorter in length than a *general purpose paper card*; e.g., a 51-column card.

#### SI

The *shift-in character*.

#### sifting sort

Synonym for *bubble sort*.

#### sight check

A *check* performed by sighting through the holes of two or more aligned *punched cards* toward a source of light to verify the punching, e.g., to determine if a hole has been punched in a corresponding *punch position* on all cards in a card deck.

#### signal

- (1) (ISO) A time-dependent value attached to a physical phenomenon and conveying *data*.
- (2) See *inhibiting signal*, *start signal*, *stop signal*.

#### signal distance.

The number of *digit positions* in which the corresponding digits of two *binary words* of the same length are different. Synonymous with *hamming distance*.

#### signal regeneration

(ISO) *Signal transformation* that restores a *signal* so that it conforms to its original specification.

#### signal shaping

(ISO) Synonym for *signal transformation*.

#### signal transformation

(ISO) The action of modifying one or more characteristics of a *signal*, such as its maximum shape or timing. Synonymous with *signal shaping*.

#### sign bit

(ISO) A *bit* or a *binary element* that occupies a *sign position* and indicates the algebraic sign of the *number* represented by the *numeral* with which it is associated.

#### sign character

(ISO) A *character* that occupies a *sign position* and indicates the algebraic sign of the *number* represented by the *numeral* with which it is associated.

#### sign digit

(ISO) A *digit* that occupies a *sign position* and indicates the algebraic sign of the *number* represented by the *numeral* with which it is associated.

#### significance

(ISO) Synonym for *weight*.

#### significant digit

(ISO) In a *numeral*, a *digit* that is needed for a given purpose; in particular, a



digit that must be kept to preserve a given *accuracy* or a given *precision*.

#### significant digit arithmetic

(ISO) A method of making calculations using a modified form of a *floating-point representation system* in which the number of *significant digits* in the *result* is determined with reference to the number of significant digits in the *operands*, the *operation* performed, and the degree of *precision* available.

#### significant figure

(ISO) Deprecated term for *significant digit*.

#### sign position

(ISO) A *position*, normally located at one end of a *numeral*, that contains an indicator denoting the algebraic sign of the *number* represented by the numeral.

#### simulate

- (1) (ISO) To represent certain features of the behavior of a physical or abstract system by the behavior of another system, e.g., to represent a physical phenomenon by means of *operations* performed by a *computer* or to represent the operations of a computer by those of another computer.
- (2) To imitate one *system* with another, primarily by *software*, so that the imitating system accepts the same *data*, *executes* the same *computer programs*, and achieves the same results as the imitated system.
- (3) Contrast with *emulate*.

#### simulation

- (1) (ISO) The representation of certain features of the behavior of a physical or abstract system by the behavior of another system, e.g., the representation of physical phenomena by means of

*operations* performed by a *computer* or the representation of operations of a computer by those of another computer.

- (2) See *real-time simulation*.

#### simulator

- (1) (ISO) A device, *data processing system*, or *computer program* that represents certain features of the behavior of a physical or abstract system.
- (2) See *computer simulator*.

#### simultaneous

- (1) (ISO) Pertaining to the occurrence of two or more *events* at the same instant of time.
- (2) Contrast with *concurrent*.
- (3) See also *consecutive*, *sequential*.

#### simultaneous computer

(ISO) A *computer* that contains a separate *unit* to perform each portion of the entire computation *concurrently*, the units being interconnected in a way determined by the computation; at different times in a *run*, a given interconnection carries *signals* representing different values of the same *variable*, e.g., a *differential analyzer*.

#### simultaneous operation

(ISO) A mode of *operation* in which two or more events occur at the same instant of time.

#### single-address

Pertaining to an *instruction format* containing one *address part*. Synonymous with one-address.

#### single precision

(ISO) Pertaining to the use of one *computer word* to represent a *number* in accordance with the required *precision*.



**single step**

Pertaining to a method of *operating* a *computer* in which each step is performed in response to a single manual operation.

**single-step operation**

(ISO) A mode of *operating* a *computer* in which a single *computer instruction* or part of a computer instruction is *executed* in response to an external *signal*.  
Synonymous with step-by-step operation.

**sink**

See *data sink*, *message sink*.

**six-bit byte**

(ISO) Synonym for *sextet*.

**skeletal code**

(ISO) A *set* of *instructions* in which some parts such as *addresses* must be completed or specified in detail each time the set is used.

**skew**

The angular displacement of a *symbol* or *data medium* from the intended or ideal placement.

**skip**

- (1) To ignore one or more *instructions* in a *sequence* of instructions.
- (2) To pass over one or more *positions* on a *data medium*, e.g., to perform one or more line feed operations.
- (3) See also *paper throw*.

**slow time scale**

Synonym for *extended time scale*.

**smooth**

To apply *procedures* that decrease or eliminate rapid fluctuations in *data*.

**snapshot dump**

- (1) (ISO) A *dynamic dump* of the con-

tents of one or more specified *storage* areas.

- (2) A *selective dump* performed at various points in a machine *run*.

**snapshot program**

(ISO) A *trace program* that produces *output data* only for selected *instructions* or for selected conditions.

**SO**

The *shift-out character*.

**software**

- (1) (ISO) *Computer programs*, *procedures*, *rules*, and possibly associated *documentation* concerned with the *operation* of a *data processing system*.
- (2) Contrast with *hardware*.

**SOH**

(ISO) The *start-of-heading character*.

**solid state component**

A component whose *operation* depends on the control of electric or magnetic phenomena in solids, e.g., a transistor, crystal diode, *ferrite core*.

**sonic delay line**

Synonym for *acoustic delay line*.

**sort**

- (1) The *operation* of sorting.
- (2) (ISO) To segregate *items* into groups according to specified criteria. Sorting involves *ordering*, but need not involve *sequencing* for the groups may be arranged in an arbitrary order.
- (3) To arrange a *set* of *items* according to keys which are used as a basis for determining the *sequence* of the items, e.g., to arrange the records of a *personnel file* into alphabetical sequence by using the employee names as *sort keys*.

(4) Synonym for *order*.

(5) See *balanced merge sort*, *bubble sort*, *exchange sort*, *external sort*, *insertion sort*, *internal sort*, *merge sort*, *multipass sort*, *oscillating sort*, *polyphase sort*, *repeated selection sort*, *selection sort*, *serial sort*, *sifting sort*, *tournament sort*, *unbalanced merge sort*.

#### sorter

- (1) (ISO) A device that deposits *punched cards* in *pockets* selected according to the *hole patterns* in the cards.
- (2) A person, device, or *computer routine* that *sorts*.
- (3) (ISO) Deprecated term for *sort program*.

#### sorting program

(ISO) Synonym for *sort program*.

#### sort key

- (1) A *key* used as a basis for determining the *sequence of items* in a *set*.
- (2) One or more *keys* within an *item*, used as a basis for determining the *sequencing* of items in a *set*.  
Synonymous with *sequencing key*.

#### sort pass

During the *execution* of a *sort program*, a single *processing* of all *items* of a *set* for the purpose of reducing the number of *strings* of items and increasing the number of items per string.

#### sort program

(ISO) A *computer program* that *sorts items* of *data*. Synonymous with *sorting program*.

#### source

See *data source*, *message source*.

#### source data card

A card which contains manually or me-

chanically recorded *data* that is to be subsequently *punched* into the same card.

#### source language

(ISO) A *language* from which *statements* are *translated*.

#### source program

- (1) (ISO) A *computer program* expressed in a *source language*.
- (2) Contrast with *object program*.

#### SP

(ISO) The *space character*.

#### space

- (1) A site intended for the *storage* of *data*, e.g., a site on a printed page or a *location* in a *storage* medium.
- (2) A basic *unit* of area, usually the size of a single *character*.
- (3) One or more *space characters*.
- (4) To advance the *reading* or *display position* according to a prescribed *format*, e.g., to advance the printing or display position horizontally to the right or vertically down.
- (5) Contrast with *backspace*.
- (6) See *working space*.

#### space character (SP)

- (1) (ISO) A *character* that is usually represented by a blank site in a series of *graphics*. The space character, though not a *control character*, has a *function* equivalent to that of a *format effector* that causes the print or *display position* to move one position forward without producing the printing or display of any graphic. Similarly, the space character may have a function equivalent to that of an *information separator*.
- (2) See also *null character*.

**span**

(1) (ISO) The difference between the highest and the lowest values that a quantity or *function* may take.

(2) See *error span*.

**special character**

(ISO) A *graphic character* in a *character set* that is not a *letter*, not a *digit*, and not a *space character*.

**special purpose computer**

(ISO) A *computer* that is designed to operate upon a restricted class of problems.

**specific address**

Synonym for *absolute address (1)*.

**specific coding**

Synonym for *absolute coding*.

**spectral response**

The variation in sensitivity of a device to light of different wavelengths.

**spool**

See *tape spool*.

**spooling**

(ISO) the *reading of output* from and the *writing of input* onto *auxiliary storage* concurrently with *job execution* in a form suitable for later *processing* or *output operations*.

**spot punch**

A device for punching one hole at a time in a *data medium*.

**spread**

(ISO) Synonym for *irrelevance*.

**sprocket holes**

Synonym for *feed holes*.

**stability**

See *computational stability*, *light stability*.

**stable state**

(ISO) In a *trigger circuit*, a state in which the circuit remains until the application of a suitable *pulse*.

**stack**

(ISO) Synonym for *pushdown list*.

**stacker**

See *card stacker*.

**standard form**

(ISO) Synonym for *normalized form*.

**standardize**

(ISO) Synonym for *normalize*.

**standing-on-nines carry**

(ISO) In *parallel addition of numbers* represented by *decimal numerals*, a *procedure* in which a *carry* input to a given *digit place* is bypassed to the next digit place. If the current *sum* in the given digit place is nine, the nine is changed to zero.

**start-of-heading character (SOH)**

(ISO) A *transmission control character* used as the first *character* of a *message heading*.

**start-of-text character (STX)**

(ISO) A *transmission control character* that precedes a *text* and may be used to terminate the *message heading*.

**start signal**

A *signal* to a receiving mechanism to get ready to receive *data* or perform a *function*.

**statement**

(1) (ISO) In a *programming language*, a

meaningful *expression* that may describe or specify *operations* and is complete in the context of this programming language.

- (2) In *computer programming*, a *symbol string* or other arrangement of symbols.
- (3) (ISO) Deprecated term for *instruction*.
- (4) See *assignment statement*, *conditional statement*, *job control statement*.

#### static dump

(ISO) A *dump* that is performed at a particular point in time with respect to a machine *run*, frequently at the end of a run, and usually under the control of the *computer operator* or *supervisory program*.

#### staticize

- (1) To convert *serial* or time-dependent *parallel data* into static form.
- (2) Loosely, to retrieve an *instruction* and its *operands* from *storage* prior to its execution.

#### static magnetic cell

(ISO) Synonym for *magnetic cell*.

#### static storage

Storage other than *dynamic storage*.

#### station

See *inquiry station*, *read station*, *remote station*, *tape station*.

#### stationary information source

(ISO) Synonymous with *stationary message source*.

#### stationary message source

(ISO) A *message source* each *message* of which has a probability of occurrence independent of the time of its occurrence. Synonymous with *stationary information source*.

#### step

- (1) One *operation* in a *computer routine*.
- (2) To cause a *computer* to execute one *operation*.
- (3) See *job step*, *single step*.

#### step-by-step operation

(ISO) Synonym for *single-step operation*.

#### stop instruction

(ISO) An *exit* that specifies the termination of the *execution* of a *computer program*.

#### stop signal

A *signal* to a receiving mechanism to wait for the next signal.

#### storage

- (1) (ISO) The action of placing *data* into a *storage device* and retaining them for subsequent use.
- (2) The retention of *data* in a *storage device*.
- (3) A *storage device*.
- (4) See *acoustic storage*, *associative storage*, *auxiliary storage*, *buffer storage*, *capacitor storage*, *cathode ray storage*, *circulating storage*, *core storage*, *cryogenic storage*, *delay line storage*, *direct access storage*, *dynamic storage*, *electrostatic storage*, *erasable storage*, *external storage*, *fixed storage*, *immediate access storage*, *internal storage*, *magnetic card storage*, *magnetic core storage*, *magnetic disk storage*, *magnetic drum storage*, *magnetic storage*, *magnetic thin-film storage*, *magnetic wire storage*, *main storage*, *mass storage*, *matrix storage*, *mercury storage*, *n-core-per-bit storage*, *nonvolatile storage*, *one-core-per-bit storage*, *parallel search storage*, *parallel storage*, *permanent storage*, *pushdown storage*, *push-up storage*, *real storage*, *serial access storage*, *static storage*, *temporary stor-*

*age, virtual storage, volatile storage, word-organized storage.*

#### **storage allocation**

- (1) (ISO) The assignment of *storage areas* to specified *data*.
- (2) See *dynamic storage allocation*.

#### **storage capacity**

(ISO) The number of *bits, characters, bytes, words*, or other *units of data* that a particular *storage device* can contain.

#### **storage cell**

(ISO) An elementary *unit of a storage device*, e.g., a *binary cell*.

#### **storage device**

(ISO) A *functional unit* into which *data* can be entered, in which they can be retained, and from which they can be retrieved.

#### **storage location**

(ISO) An area in a *storage device*, usually one that can be explicitly and uniquely specified by means of an *address*.

#### **storage protection**

An arrangement for preventing access to *storage* for either *reading*, or *writing*, or both.

#### **store**

- (1) (ISO) To enter *data* into a *storage device* or to retain data in a storage device.
- (2) (ISO) In *computer programming*, to copy data from *registers* into *internal storage*.

#### **stored program computer**

(ISO) A *computer* controlled by *internally stored instructions*, that can synthesize and store instructions, and that can subsequent-

ly execute these instructions. Synonymous with *programmed computer*.

#### **straight line coding**

- (1) (ISO) A *set of instructions* in which there are no *loops*.
- (2) (ISO) A *programming technique* in which *loops* are avoided by *unwinding*.

#### **stratified language**

- (1) (ISO) A *language* that cannot be used as its own *metalanguage*, e.g., *FORTRAN*.
- (2) Contrast with *unstratified language*.

#### **string**

- (1) (ISO) A *linear sequence* of entities such as *characters* or physical *elements*.
- (2) See *alphabetic string, binary element string, bit string, character string, null string, symbol string, unit string*.

#### **striping**

In *flowcharting*, the use of a line across the upper part of a flowchart *symbol* to signify that a detailed representation of a *function* is located elsewhere in the same *set of flowcharts*.

#### **stroke**

In *character recognition*, a straight line or arc used as a segment of a *graphic character*.

#### **stroke centerline**

In *character recognition*, a line midway between the two *stroke edges*.

#### **stroke edge**

In *character recognition*, the line of discontinuity between a side of a *stroke* and the background, obtained by averaging, over the length of the stroke, the ir-



regularities resulting from the printing and detecting processes.

#### stroke width

In *character recognition*, the distance measured perpendicularly to the *stroke center-line* between the two *stroke edges*.

#### stub card

A special purpose paper card that has a separable stub attached to a general purpose paper card. A stub card may be a *scored card*.

#### STX

(ISO) The *start-of-text character*.

#### stylus printer

(ISO) Synonym for *matrix printer*.

#### SUB

(ISO) The *substitute character*.

#### subroutine

- (1) (ISO) A *sequenced set of statements* that may be used in one or more *computer programs* and at one or more points in a computer program.
- (2) A *routine* that can be part of another routine.
- (3) See *closed subroutine*, *dynamic subroutine*, *open subroutine*, *recursive subroutine*, *reentrant subroutine*.

#### subroutine call

The *subroutine*, in *object coding*, that performs the *call function*.

#### subscript

(ISO) A *symbol* that is associated with the name of a *set* to identify a particular *subset* or *element*.

#### subset

- (1) (ISO) A *set* each *element* of which is an element of a specified other set.

- (2) See *alphabetic character subset*, *alphanumeric character subset*, *character subset*, *numeric character subset*, *proper subset*.

#### substitute character (SUB)

(ISO) A *control character* used in the place of a *character* that is recognized to be invalid or in *error*, or that cannot be represented on a given device.

#### subtractor

- (1) (ISO) A device whose *output data* are a representation of the *difference* between the *numbers* represented by its *input data*.
- (2) See *adder subtractor*, *full subtractor*, *half subtractor*.

#### subtrahend

(ISO) In a subtraction operation, the *number* or quantity subtracted from the *minuend*.

#### suffix notation

(ISO) Synonym for *postfix notation*.

#### sum

(ISO) The *number* or quantity that is the *result* of the addition of two or more numbers or quantities.

#### summary punch

(ISO) A *card punch* that may be connected to another device, such as a tabulator, to enter *data* that was calculated or summarized by the other device.

#### summation check

A *check* based on the formation of the sum of the *digits* of a *numeral*. The sum of the individual digits is usually compared with a previously computed value.

#### supervisor

- (1) (ISO) Synonym for *supervisory program, supervisory routine*.
- (2) See *overlay supervisor*.

**supervisory program**

(ISO) A *computer program*, usually part of an *operating system*, that controls the *execution* of other computer programs and regulates the flow of work in a *data processing system*. Synonymous with *executive program, supervisor*.

**supervisory routine**

(ISO) A *routine*, usually part of an *operating system*, that controls the *execution* of other routines and regulates the flow of work in a *data processing system*. Synonymous with *executive routine, supervisor*.

**swapping**

See *page swapping*.

**switch**

- (1) (ISO) In a *computer program*, a *parameter* that controls *branching* and is *bound* prior to the *branchpoint* being reached. Synonymous with *switchpoint*.
- (2) A device or *programming technique* for making a selection, e.g., a *toggle*, a *conditional jump*.

**switch core**

(ISO) A *core* in which the magnetic material generally has a high residual flux density and a high ratio of residual to saturated flux density with a *threshold* value of magnetizing force below which *switching* does not occur.

**switch indicator**

(ISO) In *computer programming*, an *indicator* that determines or shows the setting of a *switch*. Synonymous with *flag*.

**switching element**

(ISO) Deprecated term for *logic element*.

**switching function**

(ISO) A *function* that has only a finite number of possible values and the independent *variables* of which have only a finite number of possible values.

**switching variable**

(ISO) A *variable* that may take only a finite number of possible values or states.

**switchpoint**

(ISO) Synonym for *switch (1)*.

**syllable**

(ISO) A *character string* or a *binary element string* in a word.

**symbol**

- (1) (ISO) A conventional representation of a concept or a representation of a concept upon which agreement has been reached.
- (2) A representation of something by reason of relationship, association, or convention.
- (3) See *abstract symbol, flowchart symbol, logic symbol, mnemonic symbol*.

**symbolic address**

(ISO) An *address* expressed in a form convenient for *computer programming*.

**symbolic addressing**

(ISO) A method of *addressing* in which the *address part* of an *instruction* contains a *symbolic address*.

**symbolic coding**

The preparation of *routines* and *computer programs* in a *symbolic language*.

**symbolic language**

A *programming language* that expresses

*addresses and operation codes of instructions in symbols convenient to humans rather than in machine language.*

#### symbolic logic

(ISO) The discipline in which valid *arguments* and *operations* are dealt with using an *artificial language* designed to avoid the ambiguities and logical inadequacies of *natural languages*. Synonymous with mathematical logic.

#### symbol manipulation

The *processing* of *symbols* that have no explicit numerical values.

#### symbol rank

(ISO) Synonym for *digit place*.

#### symbol string

(ISO) A *string* consisting solely of *symbols*.

#### symmetric channel

See *binary symmetric channel*.

#### SYN

The *synchronous idle character*.

#### synchronization pulses

*Pulses* introduced by transmission equipment into the receiving equipment to keep the two equipments operating in step.

#### synchronous computer

- (1) (ISO) A *computer* in which each event, or the performance of any basic *operation*, is constrained to start on *signals* from a *clock* and usually to keep in step with them.
- (2) Contrast with *asynchronous computer*.

#### synchronous idle character (SYN)

(ISO) A *transmission control character* used by *synchronous data transmission systems* to provide a *signal* from which

*synchronism* or *synchronous correction* may be achieved between *data terminal equipment*, particularly when no other character is being *transmitted*.

#### synchronous operation

- (1) (ISO) An *operation* that occurs regularly or predictably with respect to the occurrence of a specified event in another *process*, e.g., the *calling* of an *input-output routine* that receives control at a pre-coded *location* in a *computer program*.
- (2) A mode of operation in which each action is started by a *clock*.

#### syntax

- (1) (ISO) The relationship among *characters* or groups of characters, independent of their meanings or the manner of their interpretation and use.
- (2) The structure of *expressions* in a *language*.
- (3) The rules governing the structure of a *language*.
- (4) The relationships among *symbols*.

#### syntax language

A *metalanguage* used to specify or describe the *syntax* of another language.

#### synthetic address

(ISO) Synonym for *generated address*.

#### system

- (1) (ISO) In *data processing*, a collection of men, machines, and methods organized to accomplish a *set* of specific *functions*.
- (2) See *data processing system*, *decimal numeration system*, *fixed-point representation system*, *fixed-radix numeration system*, *information feedback system*, *management information system*, *mixed-base numeration system*, *mixed-radix numeration*, *numeration*

*system, operating system, positional representation system, programming system, pure binary numeration system, radix numeration system, variable-point representation system.*

## T

**table**

- (1) (ISO) An *array* of *data* each *item* of which may be unambiguously identified by means of one or more *arguments*.
- (2) A collection of *data* in which each *item* is uniquely identified by a *label*, by its *position* relative to the other items, or by some other means. Synonymous with dictionary.
- (3) See *boolean operation table*, *decision table*, *function table*, *operation table*, *truth table*.

**table lookup**

- (ISO) A *procedure* for obtaining the value corresponding to an *argument* from a *table* of values.

**table lookup instruction**

- (ISO) An *instruction* that initiates a *table lookup*.

**tabulate**

- (1) To format *data* into a *table*.
- (2) To print totals.

**tabulation character**

See *horizontal tabulation character*, *vertical tabulation character*.

**tag**

- (ISO) One or more *characters*, attached to a set of *data*, that contains *information* about the set, including its identification.

**tape**

See *carriage control tape*, *chadless tape*, *magnetic tape*, *perforated tape*.

**tape code**

See *perforated tape code*.

**tape deck**

- (1) (ISO) Deprecated term for *tape unit*.
- (2) (ISO) Synonym for *tape drive*.

**tape drive**

- (1) (ISO) A mechanism for controlling the movement of *magnetic tape*. This mechanism is commonly used to move magnetic tape past a *read head* or *write head*, or to allow *automatic rewinding*. Synonymous with *tape deck*, *tape transport*.
- (2) (ISO) Deprecated term for *tape unit*.

**tape punch**

Synonym for *receiving perforator*.

**tape spool**

- (1) (ISO) A cylinder without flanges on which *punch tape* may be wound.
- (2) A coiled length of *perforated tape*.

**tape station**

- (ISO) Deprecated term for *tape unit*.

**tape transport**

- (1) (ISO) Deprecated term for *tape unit*.
- (2) (ISO) Synonym for *tape drive*.

**tape unit**

- (1) (ISO) A device containing a *tape drive*, together with *read heads* and *write heads* and associated controls.
- (2) See *magnetic tape unit*.

**target language**

- (ISO) A *language* into which *statements* are *translated*. Synonymous with *object language*.

**target program**

- (ISO) A *computer program* in a *target language* that has been *translated* from a *source language*. Synonymous with *object program*.



**task**

- (1) The basic unit of work from the standpoint of a *control program*.
- (2) In a *multiprogramming* or *multiprocessing* environment, a *computer program*, or portion thereof, capable of being specified to the *control program* as a *unit of work*. Tasks compete for *system resources*.

**tasking**

See *multitasking*.

**telecommunication**

(ISO) The *transmission of signals* over long distances, such as by telegraph, radio, or television.

**temporary storage**

In *computer programming*, *storage locations* reserved for intermediate results. Synonymous with *working storage*.

**tens complement**

(ISO) The *radix complement* in the *decimal numeration system*. Synonymous with *complement-on-ten*.

**terminal**

- (1) A point in a *system* or communication network at which *data* can either enter or leave.
- (2) See *data terminal equipment*, *user terminal*.

**ternary**

- (1) (ISO) Pertaining to a selection, choice, or condition that has three possible different values or states.
- (2) (ISO) Pertaining to a *fixed radix numeration system* having a *radix* of three.

**ternary incremental representation**

(ISO) *Incremental representation* in which the value of an increment is rounded to

one of three values, plus or minus one *quantum* or zero.

**text**

- (1) In *ASCII* and *data communication*, a *sequence of characters* treated as an entity if preceded and terminated by one *STX* and one *ETX communication control character* respectively.
- (2) Contrast with *heading*.

**thin film**

Loosely, *magnetic thin film*.

**thin film storage**

Loosely, *magnetic thin film storage*.

**three-address instruction**

(ISO) An *instruction* that contains three *address parts*.

**three-bit byte**

(ISO) Synonym for *triplet*.

**three-input adder**

Synonym for *full adder*.

**three-plus-one address instruction**

(ISO) An *instruction* that contains three *address parts*, the plus one *address* being that of the instruction that is to be executed next unless otherwise specified.

**threshold**

- (1) A logic *operator* having the property that if P is a *statement*, Q is a *statement*, R is a *statement*,..., then the threshold of P, Q, R,... is true if at least N statements are true, false if less than N statements are true, where N is a specified nonnegative *integer* called the threshold condition.
- (2) The threshold condition as in (1).

**threshold element**

- (1) (ISO) A logic *element* that performs a

*threshold operation*. Synonymous with *threshold gate*.

- (2) A device that performs the logic *threshold operation* but in which the truth of each *input statement* contributes, to the *output* determination, a *weight* associated with that statement.

#### threshold function

(ISO) A two-valued *switching function* of one or more not necessarily *boolean arguments* that take the value one if a specified mathematical function of the arguments exceeds a given *threshold* value, and zero otherwise.

#### threshold gate

(ISO) Synonym for *threshold element*.

#### threshold operation

(ISO) An *operation* performed on *operands* to obtain a value of a *threshold function*.

#### throughput

A measure of the amount of work performed by a *computing system* over a given period of time, e.g., *jobs per day*.

#### time

See *access time*, *available time*, *compiling time*, *computer time*, *corrective maintenance time*, *cycle time*, *deferred maintenance time*, *development time*, *downtime*, *emergency maintenance time*, *idle time*, *installation time*, *maintenance time*, *make-up time*, *operating time*, *preventive maintenance time*, *problem time*, *production time*, *program development time*, *program execution time*, *real time*, *translating time*, *word time*.

#### timer

(ISO) A *register* whose content is changed at regular intervals in such a manner as

to measure time. Synonymous with *clock register*, *time register*.

#### time register

(ISO) Synonym for *timer*.

#### time scale

See *extended time scale*, *fast time scale*, *variable time scale*.

#### time scale factor

In *simulation*, the ratio of *computer time* to the corresponding *problem time*.

#### time share

To use a device for two or more *interleaved* purposes.

#### time sharing

- (1) (ISO) A mode of *operation* that provides for the *interleaving* of two or more independent *processes* on one *functional unit*.
- (2) Pertaining to the *interleaved* use of time on a *computing system* that enables two or more users to *execute computer programs concurrently*.
- (3) (ISO) Deprecated term for *conversational mode*.

#### toggle

- (1) Pertaining to any device having two stable states.
- (2) Synonym for *flip-flop*.

#### tournament sort

A *repeated selection sort* in which each *subset* consists of no more than two *items*.

#### trace

A record of the *execution* of a *computer program*; it exhibits the *sequences* in which the *instructions* were executed.

#### trace program

(ISO) A *computer program* that performs

a *check* on another computer program by exhibiting the *sequence* in which the *instructions* are *executed* and usually the *results* of executing the instructions.

#### tracing routine

A *routine* that provides an historical record of specified events in the *execution* of a *computer program*.

#### track

- (1) The portion of a moving *data medium*, such as a drum, tape, or *disk*, that is accessible to a given *reading head position*.
- (2) See *address track*, *card track*, *clock track*, *feed track*, *regenerative track*.

#### track pitch

(ISO) The distance between corresponding points of adjacent *tracks*.

#### trailer card

A card that contains *information* related to the *data* on the preceding cards.

#### trailing decision

- (1) A *loop control* that is executed after the *loop body*.
- (2) Contrast with *leading decision*.

#### trailing end

The end of a *perforated tape* that last enters a *perforated-tape reader*.

#### trailing zero

In *positional notation*, a *zero* in a less significant *digit place* than the *digit place* of the least significant nonzero *digit* of a *numeral*.

#### transaction file

(ISO) A *file* containing relatively transient *data*, that, for a given application, is *processed* together with the appropriate *master file*. Synonymous with *detail file*.

#### transcribe

(ISO) To *transmit data* from one *data medium* to another, *converting* them as necessary for acceptance by the receiving medium.

#### transducer

A device for converting energy from one form to another.

#### transfer

- (1) (ISO) To send *data* from one place and to receive the data at another place. Synonymous with *move*.
- (2) (ISO) Deprecated term for *jump*.
- (3) See *block transfer*, *peripheral transfer*, *radial transfer*.

#### transfer check

A *check* on the *accuracy* of a *data transfer*.

#### transfer instruction

(ISO) Deprecated term for *jump instruction*.

#### transfer interpreter

(ISO) A device that prints on a *punched card characters* equivalent to *hole patterns* in another card.

#### transferred information

(ISO) Synonym for *transinformation content*.

#### transfer time

(ISO) The time interval between the instant the *transfer of data* starts and the instant the transfer is completed.

#### transform

- (1) (ISO) To change the form of *data* according to specified rules, without significantly changing the meaning of the data.
- (2) Synonymous with *convert*.

**transformation**

See *key transformation*, *signal transformation*.

**transinformation content**

(1) (ISO) In *information theory*, the difference between the *information content* conveyed by the occurrence of an event and the *conditional information content* conveyed by the occurrence of the same event, given the occurrence of another event; in mathematical notation, let:

$x_i, y_j$  be a pair of events, such as an input message  $x_i$  and an output message  $y_j$

$p(x_i, y_j)$  the joint probability of the occurrence of both events

$p(x_i | y_j)$  the conditional probability of the occurrence of the event  $x_i$ , given the occurrence of the event  $y_j$

$p(y_j | x_i)$  the conditional probability of the occurrence of the event  $y_j$ , given the occurrence of the event  $x_i$

$p(x_i)$  the probability of the occurrence of event  $x_i$

$p(y_j)$  the probability of the occurrence of event  $y_j$

Then this difference  $T(x_i | y_j)$  for the pair of events  $x_i, y_j$  is expressed as:

$$\begin{aligned} T(x_i | y_j) &= \log \frac{1}{p(x_i)} - \log \frac{1}{p(x_i | y_j)} \\ &= \log \frac{p(x_i | y_j)}{p(x_i)} = \log \frac{p(x_i, y_j)}{p(x_i) p(y_j)} = \log \frac{p(y_j | x_i)}{p(y_j)} = T(y_j | x_i) \end{aligned}$$

Synonymous with *mutual information*, *transferred information*, *transmitted information*.

(2) See *character mean transinformation content*, *mean transinformation content*.

**transinformation rate**

See *average transinformation rate*.

**translate**

(ISO) To *transform data* from one *language* to another.

**translate duration**

(ISO) Synonym for *translating time*.

**translate phase**

(ISO) Of a *run*, the logical subdivision that includes the *execution* of the *translator*. Synonymous with *translating phase*.

**translating phase**

(ISO) Synonym for *translate phase*.

**translating program**

(ISO) Synonym for *translator*.

**translating time**

(ISO) The elapsed time taken for the *execution* of a *translator*. Synonymous with *translate duration*.

**translator**

(ISO) A *computer program* that *translates* from one *language* into another language and in particular from one *programming language* into another programming language. Synonymous with *translating program*.

**transliterate**

(1) (ISO) To *convert data character* by character.

(2) To convert the *characters* of one *alphabet* to the corresponding characters of another alphabet.

**transmission**

- (1) The sending of *data* to one or more *locations* or recipients.
- (2) The sending of *data* from one place for reception elsewhere.
- (3) In *ASCII* and *data communication*, a series of *characters* including *headings* and *texts*.
- (4) Synonymous with *data transmission*.
- (5) See *parallel transmission*, *serial transmission*.

**transmission-block character**

See *end-of-transmission-block character*.

**transmission control character**

(ISO) Any *control character* used to control or facilitate *transmission* of *data* between *data terminal equipments*. Synonymous with *communication control character*.

**transmit**

To send *data* from one place for reception elsewhere.

**transmitted information**

(ISO) Synonym for *transinformation content*.

**transport**

See *tape device*.

**trap**

(ISO) An unprogrammed *conditional jump* to a specified *address* that is automatically activated by *hardware*, a recording being made of the *location* from which the jump occurred.

**trigger**

(ISO) To cause the immediate *execution* of a *computer program*, often by intervention from the external environment, for example by means of a manually controlled *jump* to an *entry point*.

**trigger circuit**

A circuit that has a number of *stable states* or *unstable states*, at least one being stable, and designed so that a desired transition can be initiated by the application of a suitable *pulse*.

**triple-length register**

(ISO) Three *registers* that function as a single register. Each register may be individually accessed. Synonymous with *triple register*.

**triple-precision**

(ISO) Pertaining to the use of three *computer words* to represent a *number* in accordance with the required *precision*.

**triple register**

(ISO) Synonym for *triple-length register*.

**triplet**

(ISO) A *byte* composed of three *binary elements*. Synonymous with *three-bit byte*.

**true complement**

(ISO) Deprecated term for *radix complement*.

**truncate**

To terminate a computational *process* in accordance with some rule, e.g., to end the evaluation of a power series at a specified term.

**truncation**

- (1) (ISO) The deletion or omission of a leading or of a trailing portion of a *string* in accordance with specified criteria.
- (2) (ISO) The termination of a computation *process*, before its final conclusion or natural termination, if any, in accordance with specified rules. Contrast with *round*.



**truncation error**

(ISO) An *error* due to *truncation*.

**truth table**

- (1) (ISO) An *operation table* for a *logic operation*.
- (2) A *table* that describes a *logic function* by *listing* all possible combinations of *input* values and indicating, for each combination, the true *output* values.

**turing machine**

- (1) A *mathematical model* of a device that changes its internal state and *reads* from, *writes* on, and moves a potentially infinite tape, all in accordance with its present state, thereby constituting a model for *computer-like* behavior.
- (2) See *universal turing machine*.

**turnaround time**

(ISO) The elapsed time between submission of a *job* and the return of complete results.

**twelve-punch**

A *punch* in the top row of a *Hollerith card*. Synonymous with *y-punch*.

**two-address instruction**

(ISO) An *instruction* that contains two *address parts*.

**two-bit byte**

(ISO) Synonym for *doublet*.

**two-input adder**

(ISO) Synonym for *half adder*.

**two-level address**

An *indirect address* that specifies two levels of addressing.

**two-out-of-five code**

- (1) (ISO) A *binary-coded decimal notation* in which each *decimal digit* is represented by a *binary numeral* consisting of five *bits* of which two are of one kind, conventionally ones, and three are of the other kind, conventionally zeros. The usual *weights* are 0-1-2-3-6 except for the representation of zero which is then 01100.
- (2) A *positional notation* in which each *decimal digit* is represented by five *binary digits* of which two are one kind (e.g., ones) and three are the other kind (e.g., zeros).

**two-plus-one address instruction**

(ISO) An *instruction* that contains three *address parts*, the plus-one *address* being that of the instruction that is to be *executed* next unless otherwise specified.

**twos complement**

(ISO) The *radix complement* in the *pure binary numeration system*. Synonymous with *complement-on-two*.

**type bar**

(ISO) A bar, usually mounted on an *impact printer* that holds type slugs.

**type font**

Type of a given size and style, e.g., 10-point Bodoni Modern.

**type wheel**

(ISO) Synonym for *print wheel*.

## U

**ultrafiche**

(ISO) In *micrographics*, *microfiche* with images reduced more than ninety times.

**unary operation**

(ISO) Synonym for *monadic operation*.

**unary operator**

(ISO) Synonym for *monadic operator*.

**unbalanced merge sort**

(1) A *merge sort*, which is an *external sort*, such that the sorted *subsets* created by the *internal sorts* are unequally distributed among some of the available *auxiliary storage* devices. The subsets are merged onto the remaining auxiliary storage devices and the process repeated until all items are in one sorted set.

(2) Contrast with *balanced merge sort*.

**unconditional branch instruction**

(ISO) Deprecated term for *unconditional jump instruction*.

**unconditional control transfer instruction**

(ISO) Deprecated term for *unconditional jump instruction*.

**unconditional jump**

(ISO) A *jump* that takes place whenever the *instruction* that specified it is *executed*.

**unconditional jump instruction**

(ISO) An *instruction* that specifies an *unconditional jump*.

**unconditional transfer instruction**

(ISO) Deprecated term for *unconditional jump instruction*.

**underflow**

See *arithmetic underflow*.

**unit**

(1) A device having a special *function*.

(2) A basic element.

(3) See *arithmetic and logic unit*, *arithmetic unit*, *central processing unit*, *functional unit*, *information content natural unit*, *input-output unit*, *input unit*, *logic unit*, *magnetic tape unit*, *main control unit*, *output unit*, *peripheral control unit*, *tape unit*.

**unit separator character (US)**

(ISO) The *information separator* intended to identify a logical boundary between units.

**unit string**

(ISO) A *string* consisting of only one entity.

**universal set**

(ISO) The *set* that includes all of the *elements* of concern in a given study.

**universal turing machine**

A *turing machine* that can *simulate* any other turing machine.

**unmodified instruction**

(ISO) Deprecated term for *presumptive instruction*.

**unpack**

(ISO) To recover the original form of the *data* from *packed data*.

**unstable state**

In a *trigger circuit*, a state in which the circuit remains for a finite period of time at the end of which it returns to a *stable state* without the application of a *pulse*.

**unstratified language**

- (1) (ISO) A *language* that can be used as its own *metalanguage*, e.g., most natural languages.
- (2) Contrast with *stratified language*.

**unwind**

(ISO) To state explicitly and in full, without the use of *modifiers*, all the *instructions* that are involved in the *execution* of a *loop*.

**upper curtate**

The adjacent *card rows* at the top of a *punch card*.

**uptime**

- (1) (ISO) Deprecated term for *available time*.
- (2) (ISO) Synonym for *operating time*.

**US**

The *unit separator character*.

**USASCII**

Deprecated term for *ASCII*.

**user terminal**

(ISO) An *input-output unit* by which a user communicates with an *automatic data processing system*.

**utility program**

(ISO) A *computer program* in general support of the *processes* of a *computer*; for instance, a *diagnostic program*, a *trace program*, a *sort program*. Synonymous with *service program*.

**utility routine**

(ISO) A *routine* in general support of the *processes* of a *computer*; for instance, an *input routine*. Synonymous with *service routine*.

## V

**validation**

The checking of *data* for correctness, or compliance with applicable standards, rules, and conventions.

**variable**

- (1) (ISO) In *computer programming*, a *character* or group of characters that refers to a value and, in the *execution* of a *computer program*, corresponds to an *address*.
- (2) A quantity that can assume any of a given set of values.
- (3) See *loop-control variable*, *switching variable*.

**variable-length record**

Pertaining to a *file* in which the *records* need not be uniform in length.

**variable-point representation**

- (1) A *positional representation* in which the *position* of the *radix point* is explicitly indicated by a special *character* at that position.
- (2) Contrast with *floating-point representation*.

**variable-point representation system**

(ISO) A *radix numeration system* in which the *radix point* is explicitly indicated by a *special character* at that *position*.

**variable time scale**

In *simulation*, the time scale used in *data processing* when the *time scale factor* is not constant during a *run*.

**vector**

- (1) (ISO) A quantity usually represented by an *ordered set* of numbers.
- (2) Contrast with *scalar*.

**Veitch diagram**

- (1) (ISO) A means of representing *boolean functions* in which the number of *variables* determines the number of squares in the diagram; the number of squares needed is the number of possible states, i.e., two, raised to a power determined by the number of variables.
- (2) See also *Venn diagram*.

**Venn diagram**

- (1) (ISO) A diagram in which sets are represented by regions drawn on a surface.
- (2) See also *Veitch diagram*.

**verge-punched card**

Synonym for *edge-punched card*.

**verifier**

(ISO) A device that checks the correctness of transcribed *data*, usually by *comparing* with a second transcription of the same data or by comparing a retranscription with the original data.

**verify**

- (1) To determine whether a transcription of *data* or other *operation* has been accomplished accurately.
- (2) To check the *results* of *keypunching*.

**vertical feed**

Pertaining to the entry of a *punch card* into a *card feed* with a short edge first.

**vertical positions**

See *addressable vertical positions*.

**vertical tabulation character (VT)**

(ISO) A *format effector* that causes the print or *display position* to move to the corresponding position on the next of a series of predetermined lines.

**virgin medium**

(ISO) A *data medium* in or on which *data* is not or has not been recorded.

**virtual address**

(ISO) The *address* of a notional *storage location* in *virtual storage*.

**virtual memory**

(ISO) Deprecated term for *virtual storage*.

**virtual storage**

The notion of space on *storage devices* that may be regarded as *main storage* by the user of a computing system, in which *virtual addresses* are mapped into *real addresses*. The size of the virtual storage is limited only by the *addressing* scheme of

the computing system and by the amount of *auxiliary storage* available, rather than by the actual number of *main storage locations*.

**void**

In *character recognition*, the inadvertent absence of ink within a *character outline*.

**volatile storage**

(ISO) A *storage* whose content is lost when the power is removed.

**VT**

The *vertical tabulation character*.



## W

**waiting time**

(ISO) Synonym for *latency*.

**weight**

(ISO) In a *positional representation*, the factor by which the value represented by a *character* in the *digit place* is multiplied to obtain its additive contribution in the representation of a *real number*. Synonymous with *significance*.

**who-are-you (WRU)**

See *inquiry character*.

**wire printer**

(ISO) Synonym for *matrix printer*.

**wire storage**

See *magnetic wire storage*.

**word**

- (1) (ISO) A *character string* or a *binary element string* that it is convenient for some purpose to consider as an entity.
- (2) A *character string* or a *bit string* considered as an entity.
- (3) See *alphabetic word*, *computer word*, *doubleword*, *halfword*, *index word*, *instruction word*, *machine word*, *numeric word*, *parameter word*, *reserved word*.

**word length**

(ISO) The number of *characters* or of *binary elements* in a *word*.

**word-organized storage**

(ISO) A *storage* in which only complete *words* may be accessed at a time.

**word time**

In a *storage device* that provides *serial access* to *storage locations*, the time interval between the appearance of corresponding parts of successive *words*.

**working area**

(ISO) Synonym for *working space*.

**working space**

(ISO) That portion of *main storage* that is used by a *computer program* for *temporary storage* of *data*. Synonymous with *working area*, *working storage*.

**working storage**

(ISO) Synonym for *temporary storage*, *working space*.

**write**

(ISO) To make a permanent or transient *recording* of *data* in a *storage device* or on a *data medium*.

**write cycle time**

(ISO) The minimum time interval between the starts of successive *write cycles* of a *storage device* with separate *reading* and *writing cycles*.

**write head**

A magnetic head that only *writes*.

**writing**

(ISO) The action of making a permanent or transient *recording* of *data* in a *storage device* or on a *data medium*.

## X

**X-datum line**

An imaginary line, used as a *reference edge*, along the top edge of a *punch card*, i.e., a line along the edge nearest the *twelve-punch row* of a *Hollerith card*.

**x-punch**

Synonym for *eleven-punch*.

## Y

**Y-datum line**

An imaginary line, used as a *reference edge*, passing along the right edge of a *punch card* at right angles to the *X-datum line*.

**y-punch**

Synonym for *twelve-punch*.

## Z

**zero**

(1) (ISO) In *data processing*, the *number* that, when added to or subtracted from another number, does not alter the value of that other number.

(2) See *leading zero*, *trailing zero*.

**zero-address instruction**

(ISO) An *instruction* that contains no *address part*, and is used when the *address* is implicit or when no address is required.

**zerofill**

(ISO) To *character fill* with the representation of the *character zero*. Synonymous with *zeroize*.

**zeroize**

(ISO) Synonym for *zerofill*.

**zero address**

(ISO) Synonym for *immediate address*.

**zero punch**

A *punch* in the third row from the top on a *Hollerith card*.

**zero suppression**

(ISO) The elimination from a *numeral* of zeros that have no *significance* in the numeral. Zeros that have no significance include those to the left of the nonzero *digits* in the integral part of a numeral and those to the right of the nonzero digits in the fractional part.

**zone punch**

(1) (ISO) A hole *punched* in one of the upper three *card rows* of a twelve-row *punch card*. Synonymous with *overpunch*.

(2) A hole *punched* in one of the *punch rows* designated as twelve, eleven, or zero, and sometimes eight or nine. A *zero punch*, and sometimes a *nine-punch*, by itself, is considered a *numeric punch*.

(3) A *zero punch* in combination with a *numeric punch*.

(4) Contrast with *digit punch*.





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