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P

1967–71 by Niklaus Wirth. Pascal, a compiled, structured language, built upon ALGOL, simplifies syntax while adding data types and structures such as subranges, enumerated data types, files, records, and sets. Acceptance and use of Pascal exploded with Borland International's introduction in 1984 of Turbo Pascal, a high-speed, low-cost Pascal compiler for MS-DOS systems that has sold over a million copies in its various versions. Even so, Pascal appears to be losing ground to C as a standard development language on microcomputers. *See also* ALGOL, C, compiled language.

pass In programming, the carrying out of one complete sequence of events—for example, one pass through a program loop ("WHILE x is less than 10, DO this") or one scan of a program by a compiler or an assembler (in preparation for converting program instructions to a form the computer can carry out).

In another sense, to forward a piece of data from one part of a program to another. *See also* pass by address, pass by value.

pass by address Also called pass by reference. A means of passing an argument or parameter to a subroutine. The calling routine passes the address (memory location) of the parameter to the called routine, which can then use that address to retrieve or modify the value of the parameter. *Compare* pass by value; *see also* argument, call.

pass by reference *See* pass by address.

pass by value A means of passing an argument or a parameter to a subroutine. A copy of the value of the argument is created and passed to the called routine. When this method is used, the called routine can modify the copy of the argument but it cannot modify the original argument. *Compare* pass by address; *see also* argument, call.

password A security measure used to restrict access to computer systems and sensitive files. A password is a unique string of characters that a user types in as an identification code. The system compares the code against a stored list of authorized passwords and users. If the code is legitimate, the system allows the user access, at whatever security level has been approved for the owner of the password.

password protection The use of passwords as a means of allowing only authorized users access to a computer system or its files.

paste To insert text or a graphic that has been cut or copied from one document into a different location in the same or a different document. *See also* cut and paste.

patch In programming, to repair a deficiency in the functionality of an existing routine or program, generally in response to an unforeseen need or set of operating circumstances. Patching does not necessarily imply sloppiness in implementing a solution to a problem: Patching is a common means of adding a feature or a function to an existing version of a program until the next version of the software, which presumably will have that feature or function included in its design, is released. *Compare* hack, kludge.

path A route from one point to another. In communications, a path is a link between two nodes (stations) in a network. In other contexts, a path is a route through a structured collection of information, as in a database, a program, or files stored on disk. In a database, for example, a path is the selection of branches and nodes to be traversed in a tree structure in order to progress from the root node of the tree to any other node.

In programming, a path is the sequence of instructions a computer carries out in executing a routine. In information processing, such as the theory underlying expert (deductive) systems, a path is a logical course through the "branches" of a tree of inferences (this AND that, this OR that) leading to a conclusion.

In file storage, a path is the route followed by the operating system in finding, storing, and retrieving files on a disk. On the Apple Macintosh, for example, the operating system follows routes called access paths, each identified internally by a unique number, whenever it reads from or writes to an open file. In hierarchical file systems, such as that used by the MS-DOS operating system, a path is the course leading from the root directory of a drive, such as C, to a particular file; the path can include any number of named subdirectories up to the maximum length of the

button is a small circle that, when selected, has a smaller, filled circle inside it. Radio buttons are so named because their behavior mimics that of the buttons on a radio: Selecting one button deselects the previously selected button.
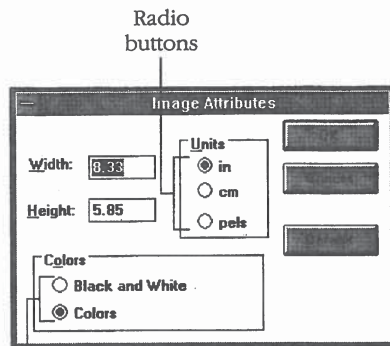
Radio button.

radio frequency Abbreviated RF. The portion of the electromagnetic spectrum with frequencies between 10 kilohertz and 3000 gigahertz. This corresponds to wavelengths between 30 kilometers and 1 millimeter.

radix The base of a number system—for example, 2 in the binary system, 10 in the decimal system, 8 in the octal system, and 16 in the hexadecimal system. *See also* base.

radix point The period or other character that separates the integer portion of a number from the fractional portion. In the decimal system, the radix point is the decimal point, as in the number 1.33.

radix sorting algorithm A sorting algorithm that sorts by grouping elements according to successive parts of their keys. A simple example is sorting a list of numbers in the range 0–999. First the list is sorted by the 100's digit into a set of (up to) 10 lists; then each list, one at a time, is sorted into a set of (up to) 10 lists based on the 10's digit; and finally, each of those lists is sorted by the 1's digit. This algorithm is usually most efficient when the sorting is done using binary values, which simplifies comparisons (Is a given bit on or off?) and reduces the number of lists (each pass produces at most two lists).

rag The irregularity along the left or right ends of the lines on a printed page. Rag complements justification, in which one or both edges of the text (both, in the center example of the illustration) form a straight vertical line. Word-processed letters and other documents are commonly left-justified, with ragged-right margins (as in the example on the left). Ragged-left text is used infrequently—typically, in advertisements—for visual effect.
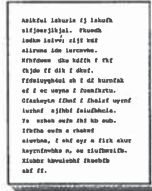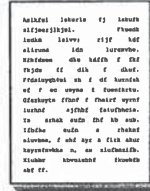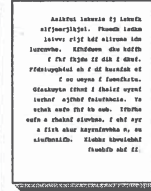

Rag.

ragged left/right See rag.

RAM Pronounced "ram." Acronym for random access memory. Semiconductor-based memory that can be read and written by the microprocessor or other hardware devices. The storage locations can be accessed in any order. Note that the various types of ROM memory are capable of random access. The term *RAM,* however, is generally understood to refer to volatile memory, which can be written as well as read. *Compare* core, EPROM, flash memory, PROM, ROM.

RAM card An add-in circuit board containing RAM memory and the interface logic necessary to decode memory addresses.

RAM cartridge *See* memory cartridge.

RAM chip A semiconductor storage device. RAM chips can be either dynamic or static memory. *See also* dynamic RAM, static RAM.

RAMDAC Pronounced "ram-dack." Acronym for random access memory digital-to-analog converter. A chip built into some VGA and SVGA

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