

A Dictionary of
Computing

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quent saving in storage may justify this.

3. See DATA COMPACTION.

Compaq Computer Corporation Compaq was an early and successful entrant into the personal computer market and into portables. In 1997, it bought Tandem Computers, a manufacturer of very high-reliability computers for the business market. In 1998, in the largest acquisition in the computer industry up to then, it bought the *Digital Equipment Corporation. In 2002, it merged with the *Hewlett-Packard Corporation.

comparator 1. A piece of hardware or software that checks the outputs of a system while that system is operational. For a single channel system (i.e. no redundancy or diversity), the comparator might check across several outputs to see that only valid combinations are produced. The comparator may deal only with binary signals, usually termed **voting logic**, or may compare analog signals. 2. A piece of software that, for example, compares the contents of two text files and highlights any differences between the contents. It is often used in *word processing or editing of program source files and as a *software quality assurance tool in *configuration management.

comparison counting sort A sorting algorithm that stores, for each sortkey, the number of keys less than the given key. If N_j denotes the number of keys less than the j th key then (assuming that keys are unique) the j th record should be in position $N_j + 1$ in a file sorted into ascending order of the keys. This is a simple but inefficient algorithm.

compartmentalization (compartmentation) The process of keeping resources with differing access attributes in separate groupings.

compatibility 1. Of hardware, the ability of a subsystem (e.g. memory) or an external device (e.g. a terminal) to be substituted for the originally designated equipment. To designate that one manufacturer's hardware can be connected to another manufacturer's hardware, the terms **plug-to-plug compatible**, or **plug-compatible**, are used. The ability of new hardware to handle interfaces of previous generations is called **backward compatibility**. 2. Of software, the ability of a computer to execute directly program code that was compiled, assembled, or written in

machine language for another computer. Generally this occurs for successive computers in a given manufacturer's line. Since later computers are usually more capable (i.e. have a larger instruction set and/or more memory), the ability to run the program of a less capable machine is usually called **upward compatibility** or **backward compatibility**. See also PORTABLE, EMULATION. 3. Of a new piece of software, the ability to reproduce the behavior of its predecessor, in particular to accept the same input formats.

compilation time The time at which a high-level language program is translated into some other representation, such as machine code, so that the program can subsequently be executed by some computer system. Compare RUN TIME.

compiler A program that translates high-level language into *absolute code, *intermediate code, or sometimes *assembly language. The input to the compiler (the source code) is a description of an algorithm or program in a problem-oriented language; its output (the object code) is an equivalent description of the algorithm in a machine-oriented language. See also JIT COMPILER.

compiler-compiler A program that accepts the syntactic and semantic description of a programming language and generates a *compiler for that language. The syntax is expressed in *BNF or a derivative thereof, and must conform to the rules dictated by the parsing technique to be used in the generated compiler. The semantics of the language are usually described by associating a code-generation procedure with each syntactic construct, and arranging to call the procedure whenever the associated construct is recognized by the parser. Thus the user still has to design the run-time structures to be used, and decide how each syntactic construct is to be mapped into machine operations. Then he/she has to write the code-generating procedures. A compiler-compiler is therefore a useful tool to aid the compiler writer, but nothing more.

Strictly speaking a compiler-compiler includes a parser generator as a component part, but the two terms are often used synonymously. See also LEX, YACC.

compiler validation See CONFORMANCE TESTING.

complement 1. of a *set, S , with respect to