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COMPUTER DICTIONARY



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ing the results against a set of expected output values.

semantic error An error in meaning; a statement that is syntactically correct (legal) but functionally wrong. For example, the C statement

```
if (b=0) b = 0.1;
```

will always end with *b* equal to 0 (and will never set it to 0.1 because *b=0* is a C assignment statement, not an equality comparison), regardless of what it was before. The statement contains a semantic error; for the statement to be functionally correct, it should be

```
if (b==0) b = 0.1;
```

because == is the operator for equality in C. *See also* logic, semantics, syntax.

semantics In programming, as in spoken language, the relationship between words or symbols and their intended meanings. Programming languages, based as they are on words with precise and usually restricted meanings, are subject to certain semantic rules. Thus, a semantic error results when a statement in a program is put together correctly but without meaning—for example, as below:

```
linesTillPageEnd = numElephants * massSun
```

The statement is syntactically correct but semantically meaningless. Although semantic errors might not ever be reported by error-checking routines in the programming environment, they will cause incorrect program behavior.

On a more conceptual level, semantics also forms a part of artificial-intelligence research. Semantic networks, for example, are attempts to represent relationships among objects, ideas, or situations in a humanlike way, as below:

```
CANARY--is a--BIRD
          | has
          FEATHERS
```

See also syntax.

semaphore In programming, a signal that is used to govern access to shared system resources. A semaphore is a flag variable—an indicator—that helps maintain order among processes that are

competing for use of such critical resources as microprocessor time and input/output ports. Although its implementation is vastly different from that of the naval flags for which it is named, the intent of a program semaphore is the same: communication to avoid confusion and error. *See also* flag.

semiconductor A substance that ranks between a conductor and a nonconductor (insulator) in its ability to conduct electricity. The resistance of a semiconductor material is moderate to high, depending on impurities (dopants) added during manufacture. The most common semiconductor materials used in electronics are silicon and germanium. The term *semiconductor* is also loosely used to refer to electronic components such as transistors and integrated circuits that are fabricated from semiconductor materials.

sensor A device that detects or measures something by converting nonelectrical energy into electrical energy. For example, a photocell detects or measures light by converting light energy into electrical energy. A sensor is one kind of transducer. *See also* transducer.

sequence An ordered arrangement, as in a set of numbers. *See also* Fibonacci numbers.

sequence check A process that determines that data or records conform to a particular sort order. *Compare* completeness check, consistency check, duplication check.

sequential access Also called serial access. A method of storing or retrieving information that requires the program to start reading at the beginning and continue until it finds the desired data. The data could be a linked sequence in which each access to a file or record points to the next file or record in the sequence. The term can be used to describe access to sequential-access files stored on disk. This type of access is best used for files in which each piece of information is related to what comes before it, such as mailing-list files and word-processing documents. Sequential access is analogous to the process of finding a particular song on an audio tape: The search must start at the beginning of the tape and continue sequentially until the song is found. *Compare* random access; *see also* indexed sequential access method.