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execution trace

processor time consumed, number of instructions executed, etc.

(2) time during which an instruction or a program is executed. The portion of one machine cycle needed by a CPU's supervisory-control unit to execute an instruction.

execution trace a record reporting information about the execution of a program. It may include details about the execution of each single instruction as well as only some details about specific aspects.

execution unit in modern CPU implementations, the module in which actual instruction execution takes place. There may be a number of execution units of different types within a single CPU, including integer processing units, floating point processing units, load/store units, and branch processing units.

executive a computer program, usually part of an operating system, that controls the execution of other programs and regulates work flow.

exhaustive search a search strategy that systematically examines every possible path through a decision tree or network. For example, for the maximum-likelihood (exhaustive search) detection of a sequence of k bits, all 2^k possible bit sequences are considered and the one with the largest likelihood is selected. Also called brute force search.

existential quantification a first order logic operator used to quantify a variable over a finite or infinite set. It is used to state that a formula is true for one or more values of a variable. It is usually represented with \exists . See universal quantification.

exit (1) a construct in a language which transfers control from the current context to some enclosing context. Sometimes this is the equivalent of a return from a function. More often, it is a specification to terminate a loop under conditions other than those specified by the loop construct, or to leave a block of code by transferring control to the end of the block (a limited form of goto).

(2) an operation in a program, whether part of the language specification or provided as a library call, that terminates execution of the program.

exoskeletal master master controller that the user in some way wears around the limbs or body, or which is fastened to the body rather than simply grasped.

expandability See extensibility.

expanded memory a term pertaining to older PC-based systems. Expanded memory specification, EMS, was developed for adding memory to PCs (the so called LIM-EMS). PCs were limited in memory to 640 Kbytes even if the 8088/8086 CPU's limit is 1 Mbyte. Thus, in order to overcome this limit, the additional memory was added by using a paging mechanism: up to four windows of 16 Kbytes of memory included into the 640 Kbytes to see up to 8 Mbytes of memory divided into pages of 16 Kbytes. To this end, special memory boards were built. Currently, the MS-DOS is still limited to 640 Kbytes, but the new microprocessors can address even several gigabytes over the first megabyte. Thus, to maintain the compatibility with the previous version and the adoption of the MS-DOS, the presence of expanded memory is simulated by means of specific drivers.

expanding phase See growing phase.

expected value of a random variable ensemble average value of a random variable that is given by integrating the random variable after scaling by its probability density function (weighted average) over the entire range.

expert system a computer program that contains a knowledge base and a set of algorithms or rules that infer new facts from knowledge and from incoming data. An expert system is an artificial intelligence application that uses a knowledge base of human expertise to aid in solving problems. The degree of problem solving is based on the quality of the data and rules obtained from the human expert. Expert systems are designed to perform at a human expert level.