

Also, specific user environment and usage history can make it difficult to reproduce the problem. Different programming languages support different styles of programming (called programming paradigms). A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Ideally, the programming language best suited for the task at hand will be selected. New languages are generally designed around the syntax of a prior language with new functionality added, (for example C++ adds object-orientation to C, and Java adds memory management and bytecode to C++, but as a result, loses efficiency and the ability for low-level manipulation). Auxiliary tasks accompanying and related to programming include analyzing requirements, testing, debugging (investigating and fixing problems), implementation of build systems, and management of derived artifacts, such as programs' machine code. Following a consistent programming style often helps readability. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. It is very difficult to determine what are the most popular modern programming languages. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). It is usually easier to code in "high-level" languages than in "low-level" ones. It is usually easier to code in "high-level" languages than in "low-level" ones. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. The academic field and the engineering practice of computer programming are both largely concerned with discovering and implementing the most efficient algorithms for a given class of problems. Auxiliary tasks accompanying and related to programming include analyzing requirements, testing, debugging (investigating and fixing problems), implementation of build systems, and management of derived artifacts, such as programs' machine code. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line. Allen Downey, in his book *How To Think Like A Computer Scientist*, writes: Many computer languages provide a mechanism to call functions provided by shared libraries. FORTRAN, the first widely used high-level language to have a functional implementation, came out in 1957, and many other languages were soon developed—in particular, COBOL aimed at commercial data processing, and Lisp for computer research. Many applications use a mix of several languages in their construction and use. Programs were mostly entered using punched cards or paper tape. Unreadable code often leads to bugs, inefficiencies, and duplicated code. For this purpose, algorithms are classified into orders using so-called Big O notation, which expresses resource use, such as execution time or memory consumption, in terms of the size of an input. Techniques like Code refactoring can enhance readability.