

Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. There are many approaches to the Software development process. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. 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. Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Some languages are more prone to some kinds of faults because their specification does not require compilers to perform as much checking as other languages. Proficient programming usually requires expertise in several different subjects, including knowledge of the application domain, details of programming languages and generic code libraries, specialized algorithms, and formal logic. Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Techniques like Code refactoring can enhance readability. For example, COBOL is still strong in corporate data centers often on large mainframe computers, Fortran in engineering applications, scripting languages in Web development, and C in embedded software. Programs were mostly entered using punched cards or paper tape. Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. Ideally, the programming language best suited for the task at hand will be selected. Unreadable code often leads to bugs, inefficiencies, and duplicated code. It is very difficult to determine what are the most popular modern programming languages. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. 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. Integrated development environments (IDEs) aim to integrate all such help. 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.