

They are the building blocks for all software, from the simplest applications to the most sophisticated ones. However, readability is more than just programming style. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Programmable devices have existed for centuries. Following a consistent programming style often helps readability. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Their jobs usually involve: Although programming has been presented in the media as a somewhat mathematical subject, some research shows that good programmers have strong skills in natural human languages, and that learning to code is similar to learning a foreign language. It is very difficult to determine what are the most popular modern programming 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. 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. Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. 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. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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). While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. 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. Later a control panel (plug board) added to his 1906 Type I Tabulator allowed it to be programmed for different jobs, and by the late 1940s, unit record equipment such as the IBM 602 and IBM 604, were programmed by control panels in a similar way, as were the first electronic computers. It affects the aspects of quality above, including portability, usability and most importantly maintainability. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards.