

They are the building blocks for all software, from the simplest applications to the most sophisticated ones. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. Unreadable code often leads to bugs, inefficiencies, and duplicated code. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. However, readability is more than just programming style. 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. 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. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. One approach popular for requirements analysis is Use Case analysis. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. 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. Expert programmers are familiar with a variety of well-established algorithms and their respective complexities and use this knowledge to choose algorithms that are best suited to the circumstances. 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. 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. Different programming languages support different styles of programming (called programming paradigms). Programmable devices have existed for centuries. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Different programming languages support different styles of programming (called programming paradigms). Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks.