

Computer programmers are those who write computer software. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Integrated development environments (IDEs) aim to integrate all such help. 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. 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. 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. 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. Programs were mostly entered using punched cards or paper tape. Programmable devices have existed for centuries. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. It is usually easier to code in "high-level" languages than in "low-level" ones. One approach popular for requirements analysis is Use Case analysis. 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. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). Many applications use a mix of several languages in their construction and use.