

A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Many applications use a mix of several languages in their construction and use. The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. Different programming languages support different styles of programming (called programming paradigms). Computer programmers are those who write computer software. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). The following properties are among the most important: In computer programming, readability refers to the ease with which a human reader can comprehend the purpose, control flow, and operation of source code. Many applications use a mix of several languages in their construction and use. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. 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. Trade-offs from this ideal involve finding enough programmers who know the language to build a team, the availability of compilers for that language, and the efficiency with which programs written in a given language execute. 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 involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Assembly languages were soon developed that let the programmer specify instruction in a text format (e.g., ADD X, TOTAL), with abbreviations for each operation code and meaningful names for specifying addresses. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). It is very difficult to determine what are the most popular modern 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. Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. 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. Different programming languages support different styles of programming (called programming paradigms).