

Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. It is very difficult to determine what are the most popular modern programming languages. Programmers typically use high-level programming languages that are more easily intelligible to humans than machine code, which is directly executed by the central processing unit. As early as the 9th century, a programmable music sequencer was invented by the Persian Banu Musa brothers, who described an automated mechanical flute player in the Book of Ingenious Devices. One approach popular for requirements analysis is Use Case analysis. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Computer programmers are those who write computer software. It is very difficult to determine what are the most popular modern programming languages. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. Ideally, the programming language best suited for the task at hand will be selected. For example, when a bug in a compiler can make it crash when parsing some large source file, a simplification of the test case that results in only few lines from the original source file can be sufficient to reproduce the same crash. It affects the aspects of quality above, including portability, usability and most importantly maintainability. 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. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). 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. When debugging the problem in a GUI, the programmer can try to skip some user interaction from the original problem description and check if remaining actions are sufficient for bugs to appear. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Many applications use a mix of several languages in their construction and use. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. Integrated development environments (IDEs) aim to integrate all such help. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Use of a static code analysis tool can help detect some possible problems.