

High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. However, because an assembly language is little more than a different notation for a machine language, two machines with different instruction sets also have different assembly languages. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line. 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*. 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. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. One approach popular for requirements analysis is Use Case analysis. 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. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). Ideally, the programming language best suited for the task at hand will be selected. 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. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Ideally, the programming language best suited for the task at hand will be selected. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. Use of a static code analysis tool can help detect some possible problems. Unreadable code often leads to bugs, inefficiencies, and duplicated code.