

Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly. There are many approaches to the Software development process. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Techniques like Code refactoring can enhance readability. Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Programming languages are essential for software development. Normally the first step in debugging is to attempt to reproduce the problem. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). Integrated development environments (IDEs) aim to integrate all such help. 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. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. 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. Programming languages are essential for software development. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. 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. Techniques like Code refactoring can enhance readability. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. It is very difficult to determine what are the most popular modern programming languages. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards.