

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. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Programmable devices have existed for centuries. Many programmers use forms of Agile software development where the various stages of formal software development are more integrated together into short cycles that take a few weeks rather than years. Unreadable code often leads to bugs, inefficiencies, and duplicated code. 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. 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. Techniques like Code refactoring can enhance readability. While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. Integrated development environments (IDEs) aim to integrate all such help. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. One approach popular for requirements analysis is Use Case analysis. However, readability is more than just programming style. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Techniques like Code refactoring can enhance readability. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. Programming languages are essential for software development. 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. Expert programmers are familiar with a variety of well-established algorithms and their respective complexities and use this knowledge to choose algorithms that are best suited to the circumstances. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. 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. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards.