

High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Unreadable code often leads to bugs, inefficiencies, and duplicated code. 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. Following a consistent programming style often helps readability. Many applications use a mix of several languages in their construction and use. Integrated development environments (IDEs) aim to integrate all such help. Methods of measuring programming language popularity include: counting the number of job advertisements that mention the language, the number of books sold and courses teaching the language (this overestimates the importance of newer languages), and estimates of the number of existing lines of code written in the language (this underestimates the number of users of business languages such as COBOL). Scripting and breakpointing is also part of this process. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). 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. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Code-breaking algorithms have also existed for centuries. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. 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. It is very difficult to determine what are the most popular modern programming 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. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Computer programmers are those who write computer software. Programming languages are essential for software development. Techniques like Code refactoring can enhance readability. Many applications use a mix of several languages in their construction and use. There are many approaches to the Software development process.