

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. 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. One approach popular for requirements analysis is Use Case analysis. Scripting and breakpointing is also part of this process. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Also, specific user environment and usage history can make it difficult to reproduce the problem. Techniques like Code refactoring can enhance readability. Techniques like Code refactoring can enhance readability. 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. Programmable devices have existed for centuries. It is very difficult to determine what are the most popular modern programming languages. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Proficient programming usually requires expertise in several different subjects, including knowledge of the application domain, details of programming languages and generic code libraries, specialized algorithms, and formal logic. Computer programmers are those who write computer software. Integrated development environments (IDEs) aim to integrate all such help. However, with the concept of the stored-program computer introduced in 1949, both programs and data were stored and manipulated in the same way in computer memory. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. One approach popular for requirements analysis is Use Case analysis. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. 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). Integrated development environments (IDEs) aim to integrate all such help. 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.