

Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. For example, COBOL is still strong in corporate data centers often on large mainframe computers, Fortran in engineering applications, scripting languages in Web development, and C in embedded software. Integrated development environments (IDEs) aim to integrate all such help. Scripting and breakpointing is also part of this process. 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. Techniques like Code refactoring can enhance readability. However, readability is more than just programming style. Integrated development environments (IDEs) aim to integrate all such help. Scripting and breakpointing is also part of this process. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Integrated development environments (IDEs) aim to integrate all such help. 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. Computer programmers are those who write computer software. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Techniques like Code refactoring can enhance readability. Code-breaking algorithms have also existed for centuries. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Normally the first step in debugging is to attempt to reproduce the problem. FORTRAN, the first widely used high-level language to have a functional implementation, came out in 1957, and many other languages were soon developed—in particular, COBOL aimed at commercial data processing, and Lisp for computer research. Programs were mostly entered using punched cards or paper tape. 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.