

It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. These compiled languages allow the programmer to write programs in terms that are syntactically richer, and more capable of abstracting the code, making it easy to target varying machine instruction sets via compilation declarations and heuristics. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. 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. Programs were mostly entered using punched cards or paper tape. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Whatever the approach to development may be, the final program must satisfy some fundamental properties. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. 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. Normally the first step in debugging is to attempt to reproduce the problem. One approach popular for requirements analysis is Use Case analysis. For example, when a bug in a compiler can make it crash when parsing some large source file, a simplification of the test case that results in only few lines from the original source file can be sufficient to reproduce the same crash. 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. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Later a control panel (plug board) added to his 1906 Type I Tabulator allowed it to be programmed for different jobs, and by the late 1940s, unit record equipment such as the IBM 602 and IBM 604, were programmed by control panels in a similar way, as were the first electronic computers. 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. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. However, Charles Babbage had already written his first program for the Analytical Engine in 1837.