

A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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. Techniques like Code refactoring can enhance readability. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in *A Manuscript on Deciphering Cryptographic Messages*. 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. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. 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. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. It is very difficult to determine what are the most popular modern programming languages. However, readability is more than just programming style. Different programming languages support different styles of programming (called programming paradigms). Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display. It is very difficult to determine what are the most popular modern programming languages. 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*. 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. 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. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Programs were mostly entered using punched cards or paper tape. Scripting and breakpointing is also part of this process. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Different programming languages support different styles of programming (called programming paradigms).