

However, readability is more than just programming style. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. In 1206, the Arab engineer Al-Jazari invented a programmable drum machine where a musical mechanical automaton could be made to play different rhythms and drum patterns, via pegs and cams. Use of a static code analysis tool can help detect some possible problems. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. One approach popular for requirements analysis is Use Case analysis. In 1206, the Arab engineer Al-Jazari invented a programmable drum machine where a musical mechanical automaton could be made to play different rhythms and drum patterns, via pegs and cams. Whatever the approach to development may be, the final program must satisfy some fundamental properties. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. The first computer program is generally dated to 1843, when mathematician Ada Lovelace published an algorithm to calculate a sequence of Bernoulli numbers, intended to be carried out by Charles Babbage's Analytical Engine. 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. Computer programmers are those who write computer software. Integrated development environments (IDEs) aim to integrate all such help. 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. However, because an assembly language is little more than a different notation for a machine language, two machines with different instruction sets also have different assembly languages. It is very difficult to determine what are the most popular modern programming languages. Techniques like Code refactoring can enhance readability. The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. Different programming languages support different styles of programming (called programming paradigms).