

There are many approaches to the Software development process. Programmers typically use high-level programming languages that are more easily intelligible to humans than machine code, which is directly executed by the central processing unit. 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. Computer programmers are those who write computer software. 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. 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. 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. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Normally the first step in debugging is to attempt to reproduce the problem. 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. Programming languages are essential for software development. 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. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. 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. 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. Programs were mostly entered using punched cards or paper tape. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Different programming languages support different styles of programming (called programming paradigms). Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. However, readability is more than just programming style. Normally the first step in debugging is to attempt to reproduce the problem. Many applications use a mix of several languages in their construction and use. Code-breaking algorithms have also existed for centuries. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users.