

Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. Assembly languages were soon developed that let the programmer specify instruction in a text format (e.g., ADD X, TOTAL), with abbreviations for each operation code and meaningful names for specifying addresses. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. 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. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). 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. Ideally, the programming language best suited for the task at hand will be selected. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Following a consistent programming style often helps readability. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. 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. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. 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. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm.