

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. 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. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Integrated development environments (IDEs) aim to integrate all such help. One approach popular for requirements analysis is Use Case analysis. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. The following properties are among the most important: In computer programming, readability refers to the ease with which a human reader can comprehend the purpose, control flow, and operation of source code. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. 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. 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. Normally the first step in debugging is to attempt to reproduce the problem. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Many applications use a mix of several languages in their construction and use. Normally the first step in debugging is to attempt to reproduce the problem. Integrated development environments (IDEs) aim to integrate all such help. Following a consistent programming style often helps readability. Proficient programming usually requires expertise in several different subjects, including knowledge of the application domain, details of programming languages and generic code libraries, specialized algorithms, and formal logic. Readability is important because programmers spend the majority of their time reading, trying to understand, reusing and modifying existing source code, rather than writing new source code. 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. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Trade-offs from this ideal involve finding enough programmers who know the language to build a team, the availability of compilers for that language, and the efficiency with which programs written in a given language execute. 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. Following a consistent programming style often helps readability.