

Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. It is very difficult to determine what are the most popular modern programming languages. 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. When debugging the problem in a GUI, the programmer can try to skip some user interaction from the original problem description and check if remaining actions are sufficient for bugs to appear. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. There are many approaches to the Software development process. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Ideally, the programming language best suited for the task at hand will be selected. Following a consistent programming style often helps readability. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line. The academic field and the engineering practice of computer programming are both largely concerned with discovering and implementing the most efficient algorithms for a given class of problems. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. Expert programmers are familiar with a variety of well-established algorithms and their respective complexities and use this knowledge to choose algorithms that are best suited to the circumstances. Programming languages are essential for software development. New languages are generally designed around the syntax of a prior language with new functionality added, (for example C++ adds object-orientation to C, and Java adds memory management and bytecode to C++, but as a result, loses efficiency and the ability for low-level manipulation). Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. It is usually easier to code in "high-level" languages than in "low-level" ones. Computer programmers are those who write computer software.