

Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. 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. 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. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. 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. 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. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Scripting and breakpointing is also part of this process. Use of a static code analysis tool can help detect some possible problems. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. It is usually easier to code in "high-level" languages than in "low-level" ones. Normally the first step in debugging is to attempt to reproduce the problem. 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. Scripting and breakpointing is also part of this process. Programming languages are essential for software development. Also, specific user environment and usage history can make it difficult to reproduce the problem. Different programming languages support different styles of programming (called programming paradigms). Unreadable code often leads to bugs, inefficiencies, and duplicated code. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). It affects the aspects of quality above, including portability, usability and most importantly maintainability. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. They are the building blocks for all software, from the simplest applications to the most sophisticated ones.