A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it..  
Programming languages are essential for software development.  
 After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug.  
 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.  
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.  
Unreadable code often leads to bugs, inefficiencies, and duplicated code.  
 High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware.  
 In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form.  
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.  
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.  
 These compiled languages allow the programmer to write programs in terms that are syntactically richer, and more capable of abstracting the code, making it easy to target varying machine instruction sets via compilation declarations and heuristics.  
 Programs were mostly entered using punched cards or paper tape.  
  
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.  
In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages.