The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference..  
Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists.  
In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them.  
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.  
 Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages.  
  
Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process.  
In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages.  
Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment.  
Normally the first step in debugging is to attempt to reproduce the problem.  
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.  
 It is very difficult to determine what are the most popular modern programming 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.  
Ideally, the programming language best suited for the task at hand will be selected.  
A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it.