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..  
It affects the aspects of quality above, including portability, usability and most importantly maintainability.  
 A similar technique used for database design is Entity-Relationship Modeling (ER Modeling).  
In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages.  
 It is very difficult to determine what are the most popular modern programming languages.  
 High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware.  
Normally the first step in debugging is to attempt to reproduce the problem.  
  
The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'.  
A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it.  
 Programmable devices have existed for centuries.  
This can be a non-trivial task, for example as with parallel processes or some unusual software bugs.  
Integrated development environments (IDEs) aim to integrate all such help.  
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.  
It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages.  
It is usually easier to code in "high-level" languages than in "low-level" ones.