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..  
 Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA).  
For this purpose, algorithms are classified into orders using so-called Big O notation, which expresses resource use, such as execution time or memory consumption, in terms of the size of an input.  
 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 following properties are among the most important:  
  
 In computer programming, readability refers to the ease with which a human reader can comprehend the purpose, control flow, and operation of source code.  
He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm.  
Also, specific user environment and usage history can make it difficult to reproduce the problem.  
Some languages are more prone to some kinds of faults because their specification does not require compilers to perform as much checking as other 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.  
 Following a consistent programming style often helps readability.  
 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.  
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.  
Programming languages are essential for software development.  
Programmers typically use high-level programming languages that are more easily intelligible to humans than machine code, which is directly executed by the central processing unit.  
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.