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.  
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.  
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.  
Programming languages are essential for software development.  
Many applications use a mix of several languages in their construction and use.  
 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.  
A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it.  
 Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages.  
 Programs were mostly entered using punched cards or paper tape.  
Normally the first step in debugging is to attempt to reproduce the problem.  
 Following a consistent programming style often helps readability.  
In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them.  
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.  
One approach popular for requirements analysis is Use Case analysis.