Assembly languages were soon developed that let the programmer specify instruction in a text format (e.g., ADD X, TOTAL), with abbreviations for each operation code and meaningful names for specifying addresses.  
Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment.  
It affects the aspects of quality above, including portability, usability and most importantly maintainability.  
However, with the concept of the stored-program computer introduced in 1949, both programs and data were stored and manipulated in the same way in computer memory.  
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.  
For example, when a bug in a compiler can make it crash when parsing some large source file, a simplification of the test case that results in only few lines from the original source file can be sufficient to reproduce the same crash.  
 Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display.  
By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers.  
 Different programming languages support different styles of programming (called programming paradigms).  
 Readability is important because programmers spend the majority of their time reading, trying to understand, reusing and modifying existing source code, rather than writing new source code.  
Ideally, the programming language best suited for the task at hand will be selected.  
It is usually easier to code in "high-level" languages than in "low-level" ones.  
 Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages.  
Ideally, the programming language best suited for the task at hand will be selected.  
Relatedly, software engineering combines engineering techniques and principles with software development.