Code-breaking algorithms have also existed for centuries. Also, specific user environment and usage history can make it difficult to reproduce the problem. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. When debugging the problem in a GUI, the programmer can try to skip some user interaction from the original problem description and check if remaining actions are sufficient for bugs to appear. Methods of measuring programming language popularity include: counting the number of job advertisements that mention the language, the number of books sold and courses teaching the language (this overestimates the importance of newer languages), and estimates of the number of existing lines of code written in the language (this underestimates the number of users of business languages such as COBOL). 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. Code-breaking algorithms have also existed for centuries. New languages are generally designed around the syntax of a prior language with new functionality added, (for example C++ adds object-orientation to C, and Java adds memory management and bytecode to C++, but as a result, loses efficiency and the ability for low-level manipulation). However, Charles Babbage had already written his first program for the Analytical Engine in 1837. One approach popular for requirements analysis is Use Case analysis. 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 the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. It affects the aspects of quality above, including portability, usability and most importantly maintainability. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. 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. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Whatever the approach to development may be, the final program must satisfy some fundamental properties. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Their jobs usually involve: Although programming has been presented in the media as a somewhat mathematical subject, some research shows that good programmers have strong skills in natural human languages, and that learning to code is similar to learning a foreign language. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly.