

This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. It is very difficult to determine what are the most popular modern programming languages. Integrated development environments (IDEs) aim to integrate all such help. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Techniques like Code refactoring can enhance 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. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. 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. For example, COBOL is still strong in corporate data centers often on large mainframe computers, Fortran in engineering applications, scripting languages in Web development, and C in embedded software. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. Trade-offs from this ideal involve finding enough programmers who know the language to build a team, the availability of compilers for that language, and the efficiency with which programs written in a given language execute. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Scripting and breakpointing is also part of this process. Unreadable code often leads to bugs, inefficiencies, and duplicated code. One approach popular for requirements analysis is Use Case analysis.