

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. Integrated development environments (IDEs) aim to integrate all such help. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic 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. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Also, specific user environment and usage history can make it difficult to reproduce the problem. As early as the 9th century, a programmable music sequencer was invented by the Persian Banu Musa brothers, who described an automated mechanical flute player in the Book of Ingenious Devices. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. 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. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Normally the first step in debugging is to attempt to reproduce the problem. Ideally, the programming language best suited for the task at hand will be selected. Normally the first step in debugging is to attempt to reproduce the problem. Programming languages are essential for software development. 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). This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. One approach popular for requirements analysis is Use Case analysis. Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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. It is usually easier to code in "high-level" languages than in "low-level" ones. The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. One approach popular for requirements analysis is Use Case analysis. It affects the aspects of quality above, including portability, usability and most importantly maintainability.