

Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. 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. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. 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). In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. 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. 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. It is very difficult to determine what are the most popular modern programming languages. 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. Normally the first step in debugging is to attempt to reproduce the problem. Scripting and breakpointing is also part of this process. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Programmable devices have existed for centuries. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Provided the functions in a library follow the appropriate run-time conventions (e.g., method of passing arguments), then these functions may be written in any other language. The academic field and the engineering practice of computer programming are both largely concerned with discovering and implementing the most efficient algorithms for a given class of problems. It is usually easier to code in "high-level" languages than in "low-level" ones. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Programmable devices have existed for centuries. One approach popular for requirements analysis is Use Case analysis. Programmable devices have existed for centuries. Whatever the approach to development may be, the final program must satisfy some fundamental properties. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards.