

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. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. FORTRAN, the first widely used high-level language to have a functional implementation, came out in 1957, and many other languages were soon developed—in particular, COBOL aimed at commercial data processing, and Lisp for computer research. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. Later a control panel (plug board) added to his 1906 Type I Tabulator allowed it to be programmed for different jobs, and by the late 1940s, unit record equipment such as the IBM 602 and IBM 604, were programmed by control panels in a similar way, as were the first electronic computers. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. 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. 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. Programmable devices have existed for centuries. Proficient programming usually requires expertise in several different subjects, including knowledge of the application domain, details of programming languages and generic code libraries, specialized algorithms, and formal logic. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. Normally the first step in debugging is to attempt to reproduce the problem. Scripting and breakpointing is also part of this process. Expert programmers are familiar with a variety of well-established algorithms and their respective complexities and use this knowledge to choose algorithms that are best suited to the circumstances. Auxiliary tasks accompanying and related to programming include analyzing requirements, testing, debugging (investigating and fixing problems), implementation of build systems, and management of derived artifacts, such as programs' machine code. Following a consistent programming style often helps readability. Allen Downey, in his book *How To Think Like A Computer Scientist*, writes: Many computer languages provide a mechanism to call functions provided by shared libraries. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. Ideally, the programming language best suited for the task at hand will be selected. FORTRAN, the first widely used high-level language to have a functional implementation, came out in 1957, and many other languages were soon developed—in particular, COBOL aimed at commercial data processing, and Lisp for computer research.