

A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. 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. Use of a static code analysis tool can help detect some possible problems. 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. Programs were mostly entered using punched cards or paper tape. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. It is usually easier to code in "high-level" languages than in "low-level" ones. 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. 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. While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. One approach popular for requirements analysis is Use Case analysis. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. 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. 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. There are many approaches to the Software development process. Also, specific user environment and usage history can make it difficult to reproduce the problem. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. However, readability is more than just programming style. For this purpose, algorithms are classified into orders using so-called Big O notation, which expresses resource use, such as execution time or memory consumption, in terms of the size of an input. 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. Integrated development environments (IDEs) aim to integrate all such help. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. 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. Following a consistent programming style often helps readability.