

In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. 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. Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly. Techniques like Code refactoring can enhance readability. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Many applications use a mix of several languages in their construction and use. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Programs were mostly entered using punched cards or paper tape. 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. 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. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Code-breaking algorithms have also existed for centuries. Ideally, the programming language best suited for the task at hand will be selected. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. 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. Programmable devices have existed for centuries. 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. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. Programming languages are essential for software development. Also, specific user environment and usage history can make it difficult to reproduce the problem. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. Programs were mostly entered using punched cards or paper tape. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills.