

In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Programmers typically use high-level programming languages that are more easily intelligible to humans than machine code, which is directly executed by the central processing unit. 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. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. 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. Techniques like Code refactoring can enhance readability. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. Unreadable code often leads to bugs, inefficiencies, and duplicated code. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Techniques like Code refactoring can enhance readability. Following a consistent programming style often helps readability. Ideally, the programming language best suited for the task at hand will be selected. Unreadable code often leads to bugs, inefficiencies, and duplicated code. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. Programmable devices have existed for centuries. Many programmers use forms of Agile software development where the various stages of formal software development are more integrated together into short cycles that take a few weeks rather than years. 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. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Programs were mostly entered using punched cards or paper tape.