

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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. There are many approaches to the Software development process. Scripting and breakpointing is also part of this process. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. Programmable devices have existed for centuries. 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. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. However, readability is more than just programming style. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. 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. 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. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Unreadable code often leads to bugs, inefficiencies, and duplicated code. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). 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. 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. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Different programming languages support different styles of programming (called programming paradigms). 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, 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. The following properties are among the most important: In computer programming, readability refers to the ease with which a human reader can comprehend the purpose, control flow, and operation of source code. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. They are the building blocks for all software, from the simplest applications to the most sophisticated ones.