

Unreadable code often leads to bugs, inefficiencies, and duplicated code. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). 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. Also, specific user environment and usage history can make it difficult to reproduce the problem. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. There are many approaches to the Software development process. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. 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 factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. Many applications use a mix of several languages in their construction and use. 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. It is usually easier to code in "high-level" languages than in "low-level" ones. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Following a consistent programming style often helps readability. Ideally, the programming language best suited for the task at hand will be selected. One approach popular for requirements analysis is Use Case analysis. The academic field and the engineering practice of computer programming are both largely concerned with discovering and implementing the most efficient algorithms for a given class of problems. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages.