

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. 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. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Normally the first step in debugging is to attempt to reproduce the problem. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). 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. Use of a static code analysis tool can help detect some possible problems. Normally the first step in debugging is to attempt to reproduce the problem. 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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. Different programming languages support different styles of programming (called programming paradigms). Programmable devices have existed for centuries. There exist a lot of different approaches for each of those tasks. Also, specific user environment and usage history can make it difficult to reproduce the problem. Allen Downey, in his book *How To Think Like A Computer Scientist*, writes: Many computer languages provide a mechanism to call functions provided by shared libraries. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. 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. Integrated development environments (IDEs) aim to integrate all such help. Expert programmers are familiar with a variety of well-established algorithms and their respective complexities and use this knowledge to choose algorithms that are best suited to the circumstances.