

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. Methods of measuring programming language popularity include: counting the number of job advertisements that mention the language, the number of books sold and courses teaching the language (this overestimates the importance of newer languages), and estimates of the number of existing lines of code written in the language (this underestimates the number of users of business languages such as COBOL). The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. 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. There are many approaches to the Software development process. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). Use of a static code analysis tool can help detect some possible problems. Following a consistent programming style often helps readability. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Code-breaking algorithms have also existed for centuries. Techniques like Code refactoring can enhance readability. Programs were mostly entered using punched cards or paper tape. 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. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Also, specific user environment and usage history can make it difficult to reproduce the problem. 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. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. Computer programmers are those who write computer software. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. Use of a static code analysis tool can help detect some possible problems. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment.