

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. Ideally, the programming language best suited for the task at hand will be selected. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). However, readability is more than just programming style. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. One approach popular for requirements analysis is Use Case analysis. Ideally, the programming language best suited for the task at hand will be selected. 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. 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. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. The first computer program is generally dated to 1843, when mathematician Ada Lovelace published an algorithm to calculate a sequence of Bernoulli numbers, intended to be carried out by Charles Babbage's Analytical Engine. New languages are generally designed around the syntax of a prior language with new functionality added, (for example C++ adds object-orientation to C, and Java adds memory management and bytecode to C++, but as a result, loses efficiency and the ability for low-level manipulation). 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). Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Computer programmers are those who write computer software. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. Computer programmers are those who write computer software. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Programmable devices have existed for centuries. In 1206, the Arab engineer Al-Jazari invented a programmable drum machine where a musical mechanical automaton could be made to play different rhythms and drum patterns, via pegs and cams. 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.