

He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. For this purpose, algorithms are classified into orders using so-called Big O notation, which expresses resource use, such as execution time or memory consumption, in terms of the size of an input. Following a consistent programming style often helps readability. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. There are many approaches to the Software development process. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. One approach popular for requirements analysis is Use Case analysis. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. There are many approaches to the Software development process. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. 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). However, Charles Babbage had already written his first program for the Analytical Engine in 1837. Normally the first step in debugging is to attempt to reproduce the problem. 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. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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.