

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. Assembly languages were soon developed that let the programmer specify instruction in a text format (e.g., ADD X, TOTAL), with abbreviations for each operation code and meaningful names for specifying addresses. For example, COBOL is still strong in corporate data centers often on large mainframe computers, Fortran in engineering applications, scripting languages in Web development, and C in embedded software. Different programming languages support different styles of programming (called programming paradigms). Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. However, because an assembly language is little more than a different notation for a machine language, two machines with different instruction sets also have different assembly languages. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. 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. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Computer programmers are those who write computer software. There exist a lot of different approaches for each of those tasks. 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. Ideally, the programming language best suited for the task at hand will be selected. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display. Programs were mostly entered using punched cards or paper tape. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). 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. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. However, with the concept of the stored-program computer introduced in 1949, both programs and data were stored and manipulated in the same way in computer memory.