

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. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. Auxiliary tasks accompanying and related to programming include analyzing requirements, testing, debugging (investigating and fixing problems), implementation of build systems, and management of derived artifacts, such as programs' machine code. 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. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Following a consistent programming style often helps readability. Code-breaking algorithms have also existed for centuries. 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. When debugging the problem in a GUI, the programmer can try to skip some user interaction from the original problem description and check if remaining actions are sufficient for bugs to appear. 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). FORTRAN, the first widely used high-level language to have a functional implementation, came out in 1957, and many other languages were soon developed—in particular, COBOL aimed at commercial data processing, and Lisp for computer research. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Scripting and breakpointing is also part of this process. 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. Computer programmers are those who write computer software. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. 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. Programming languages are essential for software development. Many applications use a mix of several languages in their construction and use. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Computer programmers are those who write computer software.