

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. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. 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). 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. Integrated development environments (IDEs) aim to integrate all such help. Normally the first step in debugging is to attempt to reproduce the problem. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Computer programmers are those who write computer software. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in *A Manuscript on Deciphering Cryptographic Messages*. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Integrated development environments (IDEs) aim to integrate all such help. 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. Computer programmers are those who write computer software. Later a control panel (plug board) added to his 1906 Type I Tabulator allowed it to be programmed for different jobs, and by the late 1940s, unit record equipment such as the IBM 602 and IBM 604, were programmed by control panels in a similar way, as were the first electronic computers. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in *A Manuscript on Deciphering Cryptographic Messages*. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. It is very difficult to determine what are the most popular modern programming languages. 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. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. Some languages are more prone to some kinds of faults because their specification does not require compilers to perform as much checking as other languages. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process.