

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. 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. 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. It is very difficult to determine what are the most popular modern programming languages. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Code-breaking algorithms have also existed for centuries. Programmers typically use high-level programming languages that are more easily intelligible to humans than machine code, which is directly executed by the central processing unit. Different programming languages support different styles of programming (called programming paradigms). Many programmers use forms of Agile software development where the various stages of formal software development are more integrated together into short cycles that take a few weeks rather than years. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. There are many approaches to the Software development process. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. There are many approaches to the Software development process. Whatever the approach to development may be, the final program must satisfy some fundamental properties. Code-breaking algorithms have also existed for centuries. 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. The first compiler related tool, the A-0 System, was developed in 1952 by Grace Hopper, who also coined the term 'compiler'. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Unreadable code often leads to bugs, inefficiencies, and duplicated code. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. 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 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.