

Programs were mostly entered using punched cards or paper tape. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. 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. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Many applications use a mix of several languages in their construction and use. 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. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. 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. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Ideally, the programming language best suited for the task at hand will be selected. Many applications use a mix of several languages in their construction and use. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. 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. It is very difficult to determine what are the most popular modern programming languages. Unreadable code often leads to bugs, inefficiencies, and duplicated code. 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. 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). Proficient programming usually requires expertise in several different subjects, including knowledge of the application domain, details of programming languages and generic code libraries, specialized algorithms, and formal logic. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form.