

Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. 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. For example, when a bug in a compiler can make it crash when parsing some large source file, a simplification of the test case that results in only few lines from the original source file can be sufficient to reproduce the same crash. Readability is important because programmers spend the majority of their time reading, trying to understand, reusing and modifying existing source code, rather than writing new source code. It is usually easier to code in "high-level" languages than in "low-level" ones. 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. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. 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). Normally the first step in debugging is to attempt to reproduce the problem. 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. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. 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. Programs were mostly entered using punched cards or paper tape. In 1801, the Jacquard loom could produce entirely different weaves by changing the "program" – a series of pasteboard cards with holes punched in them. Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly. 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. For example, when a bug in a compiler can make it crash when parsing some large source file, a simplification of the test case that results in only few lines from the original source file can be sufficient to reproduce the same crash. Programmable devices have existed for centuries. Trade-offs from this ideal involve finding enough programmers who know the language to build a team, the availability of compilers for that language, and the efficiency with which programs written in a given language execute. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. Their jobs usually involve: Although programming has been presented in the media as a somewhat mathematical subject, some research shows that good programmers have strong skills in natural human languages, and that learning to code is similar to learning a foreign language.