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. 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. 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. However, Charles Babbage had already written his first program for the Analytical Engine in 1837. Programming languages are essential for software development. 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. 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. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Whatever the approach to development may be, the final program must satisfy some fundamental properties. 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. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. However, with the concept of the stored-program computer introduced in 1949, both programs and data were stored and manipulated in the same way in computer memory. Different programming languages support different styles of programming (called programming paradigms). Programs were mostly entered using punched cards or paper tape. 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. 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). It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Different programming languages support different styles of programming (called programming paradigms). 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. Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Integrated development environments (IDEs) aim to integrate all such help.