A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. While these are sometimes considered programming, often the term software development is used for this larger overall process – with the terms programming, implementation, and coding reserved for the writing and editing of code per se. 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. Code-breaking algorithms have also existed for centuries. Sometimes software development is known as software engineering, especially when it employs formal methods or follows an engineering design process. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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 applications use a mix of several languages in their construction and use. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. 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. Many applications use a mix of several languages in their construction and use. 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. Computer programmers are those who write computer software. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line. These compiled languages allow the programmer to write programs in terms that are syntactically richer, and more capable of abstracting the code, making it easy to target varying machine instruction sets via compilation declarations and heuristics. 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 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. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Computer programmers are those who write computer software. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Debugging is often done with IDEs. Standalone debuggers like GDB are also used, and these often provide less of a visual environment, usually using a command line.