

The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). Unreadable code often leads to bugs, inefficiencies, and duplicated code. It is usually easier to code in "high-level" languages than in "low-level" ones. Programs were mostly entered using punched cards or paper tape. There exist a lot of different approaches for each of those tasks. 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. Use of a static code analysis tool can help detect some possible problems. One approach popular for requirements analysis is Use Case analysis. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. 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. The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. 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. Following a consistent programming style often helps readability. 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. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). 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, readability is more than just programming style. The academic field and the engineering practice of computer programming are both largely concerned with discovering and implementing the most efficient algorithms for a given class of problems. It is usually easier to code in "high-level" languages than in "low-level" ones. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Computer programmers are those who write computer software. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. 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. Whatever the approach to development may be, the final program must satisfy some fundamental properties.