

There are many approaches to the Software development process. 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). The following properties are among the most important: In computer programming, readability refers to the ease with which a human reader can comprehend the purpose, control flow, and operation of source code. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. Many applications use a mix of several languages in their construction and use. Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. 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. Different programming languages support different styles of programming (called programming paradigms). However, Charles Babbage had already written his first program for the Analytical Engine in 1837. 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. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. 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. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. Programs were mostly entered using punched cards or paper tape. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. As early as the 9th century, a programmable music sequencer was invented by the Persian Banu Musa brothers, who described an automated mechanical flute player in the Book of Ingenious Devices. Computer programmers are those who write computer software. Various visual programming languages have also been developed with the intent to resolve readability concerns by adopting non-traditional approaches to code structure and display. Following a consistent programming style often helps readability. 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. However, because an assembly language is little more than a different notation for a machine language, two machines with different instruction sets also have different assembly languages.