

It is very difficult to determine what are the most popular modern programming languages. In 1206, the Arab engineer Al-Jazari invented a programmable drum machine where a musical mechanical automaton could be made to play different rhythms and drum patterns, via pegs and cams. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. Ideally, the programming language best suited for the task at hand will be selected. Whatever the approach to development may be, the final program must satisfy some fundamental properties. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Different programming languages support different styles of programming (called programming paradigms). 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. Unreadable code often leads to bugs, inefficiencies, and duplicated code. Also, specific user environment and usage history can make it difficult to reproduce the problem. This can be a non-trivial task, for example as with parallel processes or some unusual software bugs. 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 factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Programming languages are essential for software development. There exist a lot of different approaches for each of those tasks. 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. One approach popular for requirements analysis is Use Case analysis. Unreadable code often leads to bugs, inefficiencies, and duplicated code. 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. Whatever the approach to development may be, the final program must satisfy some fundamental properties. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation.