

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. There are many approaches to the Software development process. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. Computer programmers are those who write computer software. 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. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills. 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. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages. It involves designing and implementing algorithms, step-by-step specifications of procedures, by writing code in one or more programming languages. Programs were mostly entered using punched cards or paper tape. 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. Use of a static code analysis tool can help detect some possible problems. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. Programs were mostly entered using punched cards or paper tape. Some of these factors include: The presentation aspects of this (such as indents, line breaks, color highlighting, and so on) are often handled by the source code editor, but the content aspects reflect the programmer's talent and skills. 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. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. After the bug is reproduced, the input of the program may need to be simplified to make it easier to debug. It is very difficult to determine what are the most popular modern programming languages. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. Use of a static code analysis tool can help detect some possible problems.