

Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. 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. Computer programmers are those who write computer software. 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. In the 1880s, Herman Hollerith invented the concept of storing data in machine-readable form. 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. 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. Normally the first step in debugging is to attempt to reproduce the problem. Programming languages are essential for software development. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. Assembly languages were soon developed that let the programmer specify instruction in a text format (e.g., ADD X, TOTAL), with abbreviations for each operation code and meaningful names for specifying addresses. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. Programmable devices have existed for centuries. Many applications use a mix of several languages in their construction and use. 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. Programmable devices have existed for centuries. 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. Following a consistent programming style often helps readability. 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. However, readability is more than just programming style. Use of a static code analysis tool can help detect some possible problems. Computer programmers are those who write computer software. In the 9th century, the Arab mathematician Al-Kindi described a cryptographic algorithm for deciphering encrypted code, in A Manuscript on Deciphering Cryptographic Messages.