Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. 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. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. 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. New languages are generally designed around the syntax of a prior language with new functionality added, (for example C++ adds object-orientation to C, and Java adds memory management and bytecode to C++, but as a result, loses efficiency and the ability for low-level manipulation). Some languages are very popular for particular kinds of applications, while some languages are regularly used to write many different kinds of applications. 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. Compilers harnessed the power of computers to make programming easier by allowing programmers to specify calculations by entering a formula using infix notation. Programming languages are essential for software development. 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. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. 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. The first step in most formal software development processes is requirements analysis, followed by testing to determine value modeling, implementation, and failure elimination (debugging). Machine code was the language of early programs, written in the instruction set of the particular machine, often in binary notation. Whatever the approach to development may be, the final program must satisfy some fundamental properties. Unreadable code often leads to bugs, inefficiencies, and duplicated code. A study found that a few simple readability transformations made code shorter and drastically reduced the time to understand it. Normally the first step in debugging is to attempt to reproduce the problem. For example, COBOL is still strong in corporate data centers often on large mainframe computers, Fortran in engineering applications, scripting languages in Web development, and C in embedded software. A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). A similar technique used for database design is Entity-Relationship Modeling (ER Modeling). Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. He gave the first description of cryptanalysis by frequency analysis, the earliest code-breaking algorithm. It is usually easier to code in "high-level" languages than in "low-level" ones.