Trial-and-error/divide-and-conquer is needed: the programmer will try to remove some parts of the original test case and check if the problem still exists.  
Many programmers use forms of Agile software development where the various stages of formal software development are more integrated together into short cycles that take a few weeks rather than years.  
Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment.  
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.  
Transpiling on the other hand, takes the source-code from a high-level programming language and converts it into bytecode.  
Unreadable code often leads to bugs, inefficiencies, and duplicated code.  
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.  
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.  
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.  
Compiling takes the source code from a low-level programming language and converts it into machine code.  
Proficient programming thus usually requires expertise in several different subjects, including knowledge of the application domain, specialized algorithms, and formal logic.  
Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly.  
Normally the first step in debugging is to attempt to reproduce the problem.  
 Whatever the approach to development may be, the final program must satisfy some fundamental properties.  
 Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages.