

Implementation techniques include imperative languages (object-oriented or procedural), functional languages, and logic languages. Many applications use a mix of several languages in their construction and use. 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. It affects the aspects of quality above, including portability, usability and most importantly maintainability. Many factors, having little or nothing to do with the ability of the computer to efficiently compile and execute the code, contribute to readability. Following a consistent programming style often helps readability. Some text editors such as Emacs allow GDB to be invoked through them, to provide a visual environment. It is very difficult to determine what are the most popular modern programming languages. Normally the first step in debugging is to attempt to reproduce the problem. Debugging is a very important task in the software development process since having defects in a program can have significant consequences for its users. Auxiliary tasks accompanying and related to programming include analyzing requirements, testing, debugging (investigating and fixing problems), implementation of build systems, and management of derived artifacts, such as programs' machine code. It is very difficult to determine what are the most popular modern programming languages. 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. High-level languages made the process of developing a program simpler and more understandable, and less bound to the underlying hardware. 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. They are the building blocks for all software, from the simplest applications to the most sophisticated ones. Popular modeling techniques include Object-Oriented Analysis and Design (OOAD) and Model-Driven Architecture (MDA). 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). 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. However, because an assembly language is little more than a different notation for a machine language, two machines with different instruction sets also have different assembly languages. Text editors were also developed that allowed changes and corrections to be made much more easily than with punched cards. The Unified Modeling Language (UML) is a notation used for both the OOAD and MDA. Methods of measuring programming language popularity include: counting the number of job advertisements that mention the language, the number of books sold and courses teaching the language (this overestimates the importance of newer languages), and estimates of the number of existing lines of code written in the language (this underestimates the number of users of business languages such as COBOL). 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. Normally the first step in debugging is to attempt to reproduce the problem.