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[**Programming General** 1](#_Toc512086512)

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| **Programming General** |
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| What is a Programming language? |
| Set of instructions that can be used to perform various tasks from computer. |
| What are the types of Programming language? |
| Based on the level of Execution   1. Machine language 2. Assembly language 3. High-level language |
| What is Machine Language? |
| The most basic (called low-level) computer language is the machine language that uses binary ('1' and '0') code which a computer can execute very fast without using any translator or interpreter program, but is tedious and complex.  Programs written in high-level languages are also either compiled and/or interpreted into machine language so that computers can execute them.  Machine Instruction Example:  00000000  00000001  00000010  00000100 |
| What is Assembly language? |
| An assembly language implements a symbolic representation of the machine code needed to program a given CPU architecture.  Though assembly language statements are readable, the statements are still low-level.  A disadvantage of assembly language is that it is not portable, because each platform comes with a particular Assembly Language.  Assembly language Example: |
| What is High-level language? |
| Language which enables programmer, to write programs that more or less independent of a particular type of computer.  Such languages are considered high-level because they are closer to human languages and further from machine languages.  High-level languages are very readable and portable.  Languages such as C, C++ and Java are all high-level languages. |
| Can you further classify High level Language? |
| High-level languages can further be classified as:   1. Functional languages 2. Procedural languages 3. Object Oriented Programming languages |
| What is Functional language? |
| Functional programming is a paradigm which concentrates on computing results rather than on performing actions.  The idea of a functional language is like that of a mathematical function - a function will accept a set of arguments (values) and return a value. (The value could be a single thing or a list, etc.)  That is, when you call a function, the only significant effect that the function has is usually to compute a value and return it. Of course, behind the scenes the function is using CPU time, allocating and writing memory, but from the programmer's point of view, the primary effect is the return value.  Example of functional programming languages : Lisp, Python, Erlang, Haskell, Clojure etc. |
| What is a Procedural language? |
| The idea of a procedural language is that of performing actions. I.e.: flow-control, loops, allocation of resources, change values in memory, etc.  In Procedural Languages, a program is written in sequence of steps that should be followed to produce a result.  Example of Procedural programming languages : COBOL, FORTRAN, C etc. |
| What is Object Oriented Programming language? |
| In OOP languages, program is divided into Object that contains data as well as methods that operate on the data.  Example of Object Oriented Programming languages : Java, C# and C++ |
| Is Java a pure Object Based Programming Language? |
| Java is an OOP language, but it is not a pure Object Based Programming Language.    There are seven qualities to be satisfied for a programming language to be pure Object Oriented.  They are:   1. Encapsulation/Data Hiding 2. Abstraction 3. Inheritance 4. Polymorphism 5. All predefined types are objects 6. All user defined types are objects. 7. All operations are performed by sending messages to objects   Java is not because it supports Primitive datatype such as int, byte, long... etc, to be used, which are not objects.  Smalltalk, is a pure OOP language, where there are no primitive types, boolean, int are all objects. |
| List down some differences between Java and JavaScript? |
| |  |  |  | | --- | --- | --- | |  | Java | JavaScript | | object oriented programming | Java is an object oriented programming language. | JavaScript is an object based programming language. | | run in a virtual machine or browser | Java creates application that can run in a virtual machine or browser. | JavaScript code run on browser only. | | compiled and interpreted | Java code is compiled and interpreted | JavaScript is interpreted. | | Strongly/ weakly type | strongly type language | weakly typed language  In JavaScript there is var keyword is used to define variable and according to value it takes datatype of that variable automatically. | |
| List down some differences between Java and C++? |
| |  |  |  | | --- | --- | --- | |  | Java | C++ | | platform-independent | Java is platform-independent | C++ is platform-dependent. | | doesn't support multiple inheritance | Java doesn't support multiple inheritance through class.  It can be achieved by interfaces in java. | C++ supports multiple inheritance. | | Object class is the root | Java uses single inheritance tree always because all classes are the child of Object class in java. Object class is the root of inheritance tree in java. | C++ creates a new inheritance tree always. | | Restricted pointer | java has restricted pointer.  Java supports pointer internally. But you can't write the pointer program in java. | C++ supports pointers. | | compiler Vs interpreter | Java uses compiler and interpreter both. | C++ uses compiler only. | | structures and unions | Java doesn't support structures and unions | C++ supports structures and unions. | | Threading | Java has built-in thread support. | C++ doesn't have built-in support for threads. It relies on third-party libraries for thread support. | | Documentation comment | Java supports documentation comment (/\*\* ... \*/) to create documentation for java source code. | C++ doesn't support documentation comment. | |  |  |  | |
| List down some differences between Java and Python? |
| |  |  |  | | --- | --- | --- | |  | Java | Python | | Static Vs Dynamic  Variable-typing | Java forces you to define the type of a variable when you first declare it and will not allow you to change the type later in the program. This is known as static typing. | Python uses dynamic typing, which allows you to change the type of a variable | | uses indentation to separate code into blocks | Java, uses curly braces to define the beginning and end of each function and class definition. | Python uses indentation to separate code into blocks. | | platform-independent | The great advantage of Java is that it can be used to create platform-independent applications. Any computer or mobile device that is able to run the Java virtual machine can run a Java application. | Python programs need a compiler that can turn Python code into code that your particular operating system can understand. | | Java is slow than Python! | Java programs run more slowly than Python programs. | Java programs run more slowly than Python programs. | |
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