**What is Java?**

Developed by Sun Microsystems in 1995, Java is a highly popular, object-oriented programming language. This platform independent programming language is utilized for Android development, web development, artificial intelligence, cloud applications, and much more.

[Java Tutorial | Learn Java Programming (geeksforgeeks.org)](https://www.geeksforgeeks.org/java/?ref=shm)

## Features of Java:

* Java is Object Oriented. However, it is not considered as pure object-oriented as it provides support for primitive data types (like int, char, etc)
* The Java codes are first compiled into byte code (machine-independent code). Then the byte code runs on **Java Virtual Machine** (JVM) regardless of the underlying architecture.
* Java syntax is similar to C/C++. But Java does not provide low-level programming functionalities like pointers. Also, Java codes are always written in the form of classes and objects.

**Applications of Java:**

* Mobile Applications
* Desktop GUI Applications
* Artificial intelligence
* Scientific Applications
* Cloud Applications
* Embedded Systems
* Gaming Applications

**Overview of Java**

* [Introduction to Java](https://www.geeksforgeeks.org/introduction-to-java/)
* [History of Java](https://www.geeksforgeeks.org/the-complete-history-of-java-programming-language/)
* [Java vs C++ Python](https://www.geeksforgeeks.org/c-vs-java-vs-python/)
* [How to Download and Install Java?](https://www.geeksforgeeks.org/how-to-download-and-install-java-for-64-bit-machine/)
* [Setting Up the Environment in Java](https://www.geeksforgeeks.org/setting-environment-java/)
* [How to Download and Install Eclipse on Windows?](https://www.geeksforgeeks.org/how-to-download-and-install-eclipse-on-windows/)
* [Java Development Kit (JDK) in Java](https://www.geeksforgeeks.org/jdk-in-java/)
* [JVM and its architecture](https://www.geeksforgeeks.org/jvm-works-jvm-architecture/)
* [Differences between JDK, JRE, and JVM](https://www.geeksforgeeks.org/differences-jdk-jre-jvm/)
* [Just In Time Compiler](https://www.geeksforgeeks.org/just-in-time-compiler/)
* [Difference Between JIT and JVM](https://www.geeksforgeeks.org/difference-between-jit-and-jvm-in-java/)
* [Difference Between Byte Code and Machine Code](https://www.geeksforgeeks.org/difference-between-byte-code-and-machine-code/)
* [How is the Java platform independent?](https://www.geeksforgeeks.org/java-platform-independent/)

# Introduction to Java:

Java is a class-based, object-oriented programming language. write once, and run anywhere (WORA), meaning that compiled Java code can run on all platforms.

Implementation of a Java application program involves a following step. They include:  
1. Creating the program  
2. Compiling the program  
3. Running the program

before creating the program, the **Java Development Kit (JDK)** must be properly installed on our system.

### **Java Terminology:**

**1.  Java Virtual Machine(JVM):**

 three execution phases of a program. They are written, compile and run the program.

* Writing a program is done by a java programmer.
* The compilation is done by the **JAVAC** compiler included in the Java development kit (JDK). It takes the Java program as input and generates bytecode as output.
* In the Runningphase of a program,**JVM** executes the bytecode generated by the compiler.
* The function of JVM is to execute the bytecode produced by the compiler. Every Operating System has a different JVM but the output they produce after the execution of bytecode is the same across all the OS. This is why Java is known as a**platform-independent language.**

**2. Bytecode in**the **Development Process:**

**T**he Javac compiler of JDK compiles the java source code into bytecode. It is saved as **.class** file by the compiler. To view the bytecode, a disassembler like [javap](https://www.geeksforgeeks.org/javap-tool-in-java-with-examples/) can be used.

**3. Java Development Kit(JDK):**

It is a complete Java development kit that includes everything including compiler, Java Runtime Environment (JRE), java debuggers, java docs, etc. For the program to execute in java, we need to install JDK on our computer in order to create, compile and run the java program.

**4. Java Runtime Environment (JRE):**JDK includes JRE. JRE installation on our computers allows the java program to run, however, we cannot compile it. JRE includes a browser, JVM, applet support, and plugins. For running the java program, a computer needs JRE.

JDK includes complier, JRE to execute program.

JRE is used to run the program but not for compile.

JVM (complier will covert source code to byte code) is responsible to convert byte code to source irrespective of OS.

**5. Garbage Collector:**In Java, programmers can’t delete the objects. To delete or recollect that memory JVM has a program called [Garbage Collector](https://www.geeksforgeeks.org/garbage-collection-java/). Garbage Collectors can recollect the objects that are not referenced. So Java makes the life of a programmer easy by handling memory management.