

Java is a high-level, object-oriented programming language developed by Sun Microsystems in 1995 and is now maintained by Oracle Corporation.

Its main principle is "**Write Once, Run Anywhere (WORA)**." This means Java programs are compiled into **bytecode**, which runs on the **Java Virtual Machine (JVM)**, allowing the same program to work on different operating systems without modification.

Key features of Java

- **Platform-independent:** Runs on Windows, macOS, Linux, and other systems through the JVM.
- **Object-oriented:** Organizes code into classes and objects, making programs easier to maintain and reuse.
- **Secure:** Includes features such as bytecode verification and memory management.
- **Robust:** Automatic garbage collection helps manage memory and reduces common programming errors.
- **Multithreaded:** Supports running multiple tasks simultaneously.
- **Widely used:** Powers enterprise software, Android applications (historically), web services, cloud applications, and big data systems.

Simple Java example (HelloWorld.java):-

```
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

Compile:-

```
javac HelloWorld.java
```

Run:-

```
java HelloWorld.
```

Output:-

```
Hello, World!
```

Common uses of Java

- Enterprise applications (banking, insurance, e-commerce)
- Web applications
- Android app development (using Java or Kotlin)
- Cloud and distributed systems

- Desktop applications
- Big data frameworks such as Apache Hadoop

Why learn Java?

- It has a simple, readable syntax for beginners.
- It's one of the most widely used programming languages in industry.
- It has a large ecosystem of libraries and frameworks.
- Java developers are in demand across many software engineering fields.