

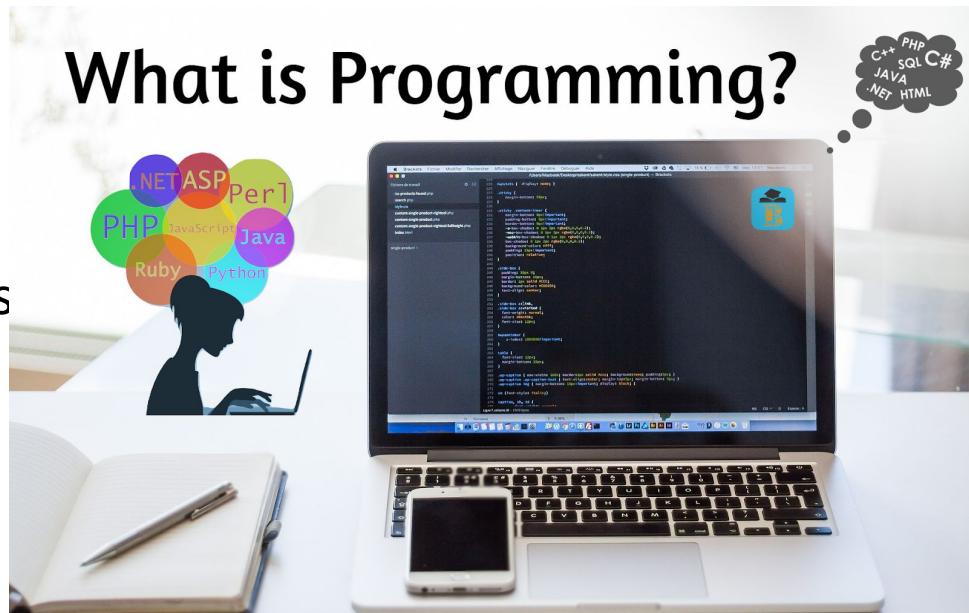


# Introduction of Java

# Programming ?

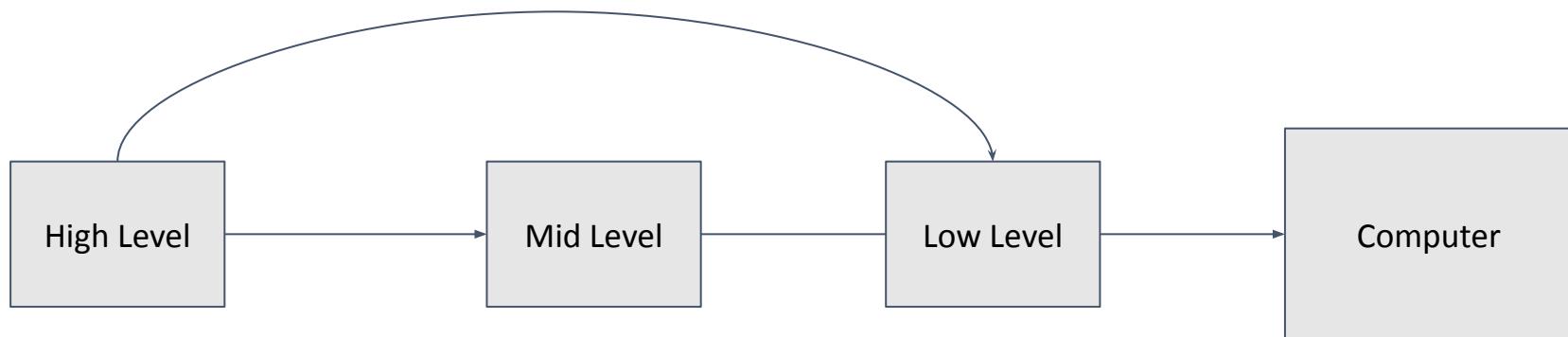
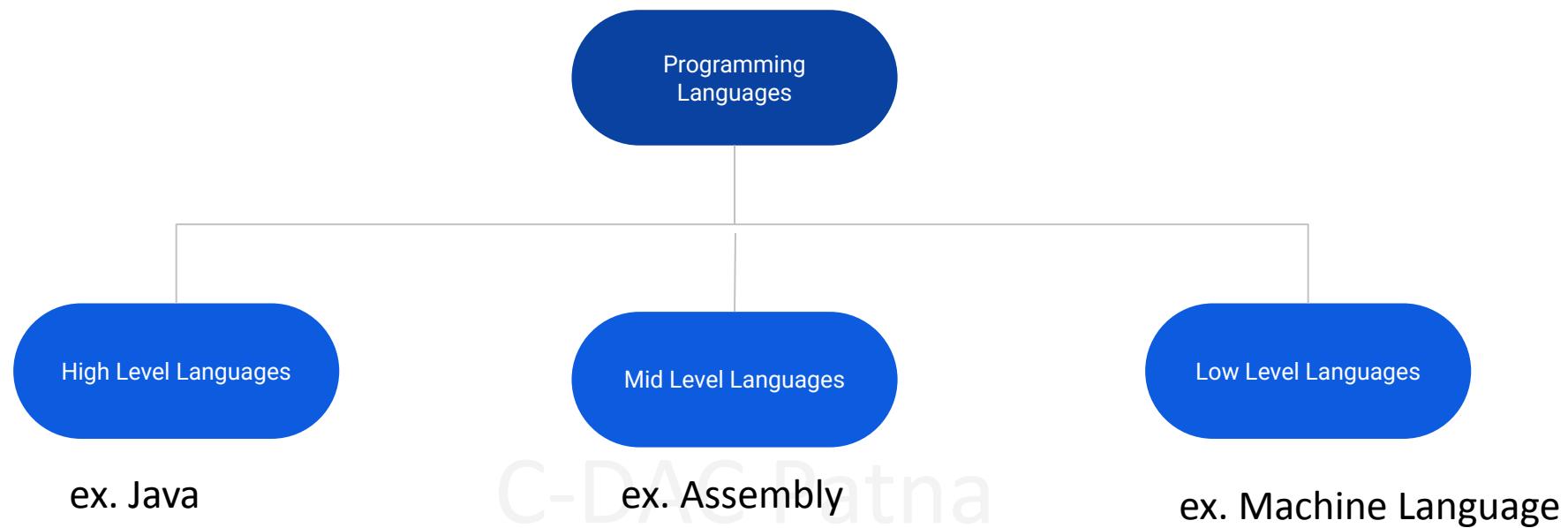
Programming is the process of giving instructions to a computer so it can perform specific tasks.

What is Programming Language ?



Source: Internet

# Types of Programming Languages



# Introduction to Java Programming Language

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Java is a **high-level**, object-oriented, and **case-sensitive** programming language used to build **general-purpose** applications, including web, mobile, desktop, enterprise, and embedded systems.

It is one of the most widely used programming languages in the world, powering Android apps, games, banking software, and **enterprise systems**.

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# History of Java

- ❑ James Gosling, known as the "father of Java".
- ❑ Developed at Sun Microsystems in 1991.
- ❑ Originally named “Oak”.
- ❑ Java’s slogan was:

**“Write Once, Run Anywhere” WORA**

Because Java code runs on any machine that has the Java Virtual Machine (JVM)

- ❑ Java is one of the most used programming languages in the world.
- ❑ Used in Android apps, web applications, banking systems, and more.



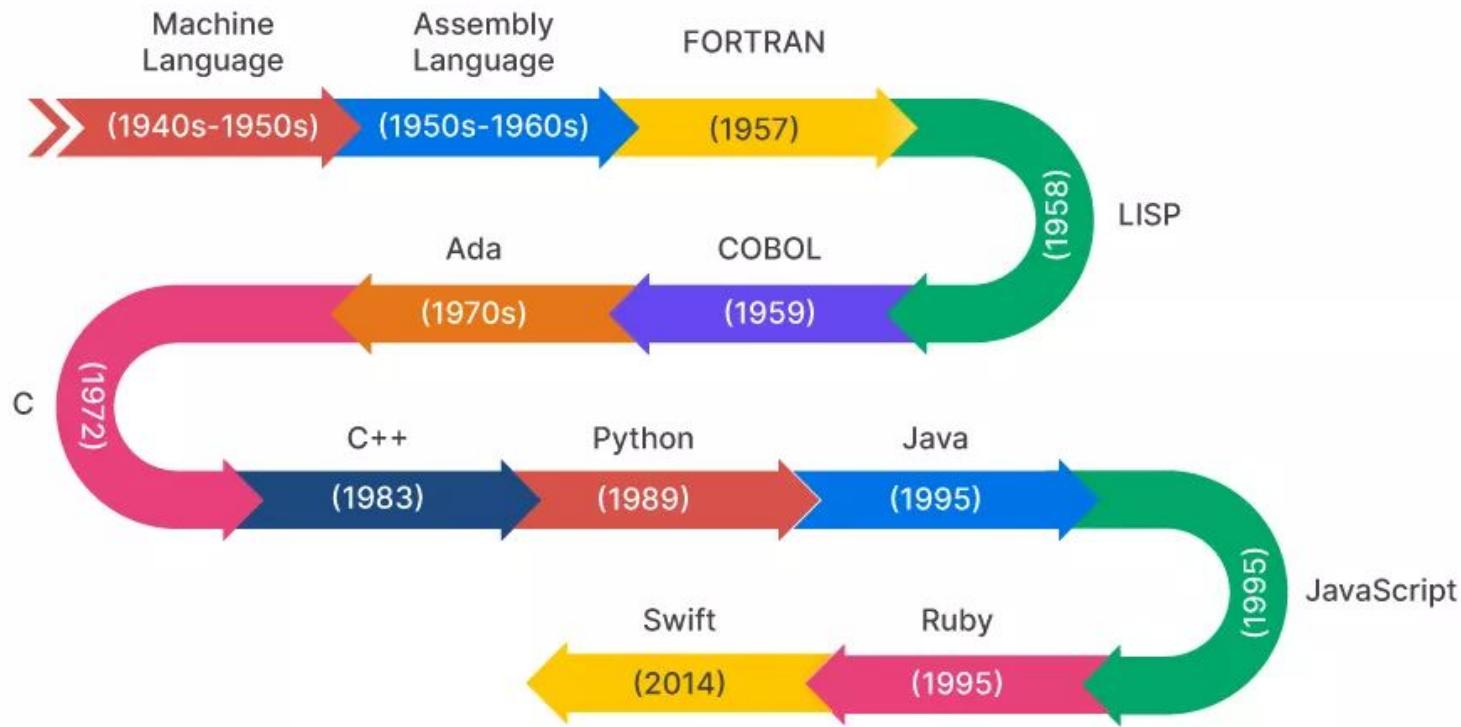
Source: Wikipedia

# History of Java

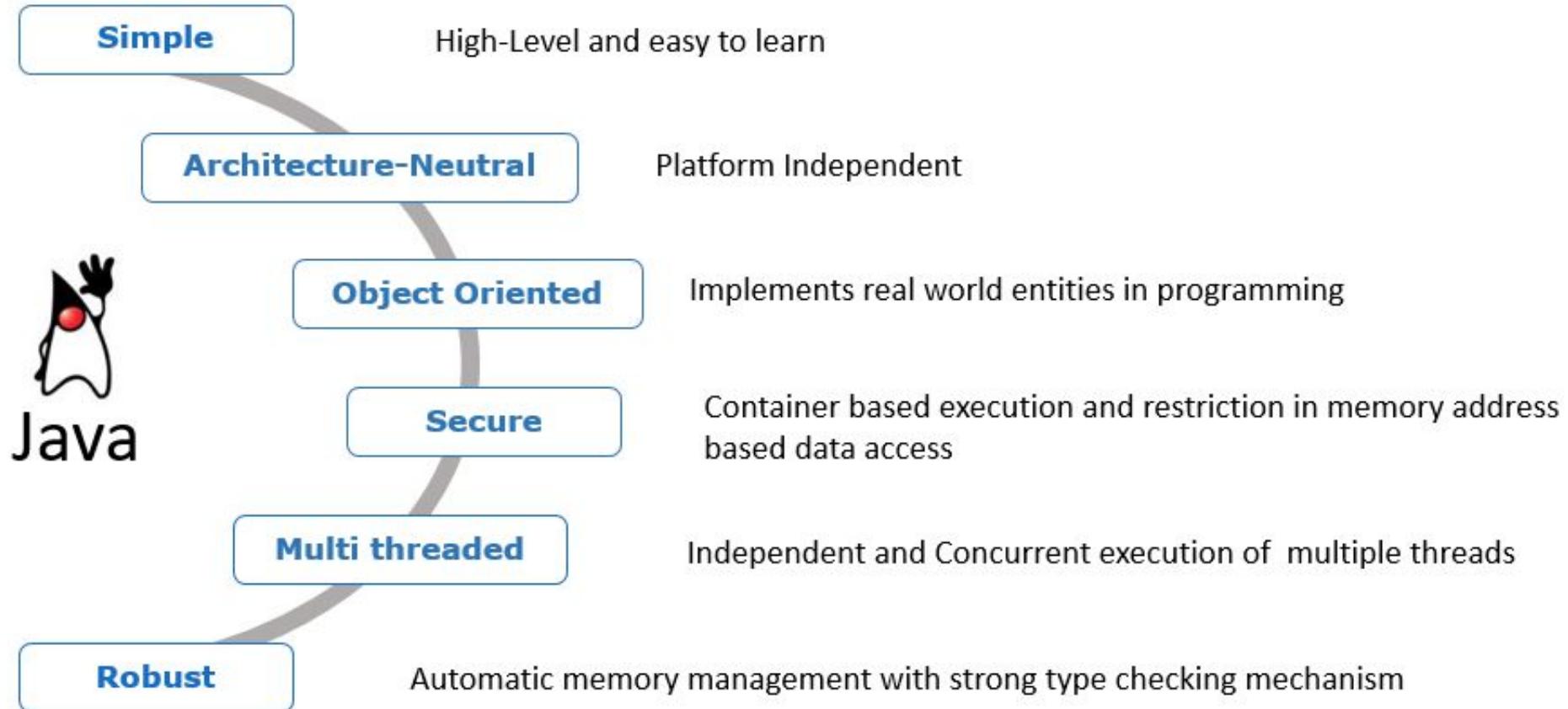
Year	Milestone
1991	Project started (called Oak)
1995	Java 1.0 released by Sun Microsystems
1996	First official Java version (Java Development Kit 1.0)
2006	Java became <b>open-source</b>
2010	Oracle acquired Sun Microsystems
2011-2023	Multiple versions: Java 7 → 8 → 11 → 17 → 21 (Long Term Support)

We will use java 11 here.

# History

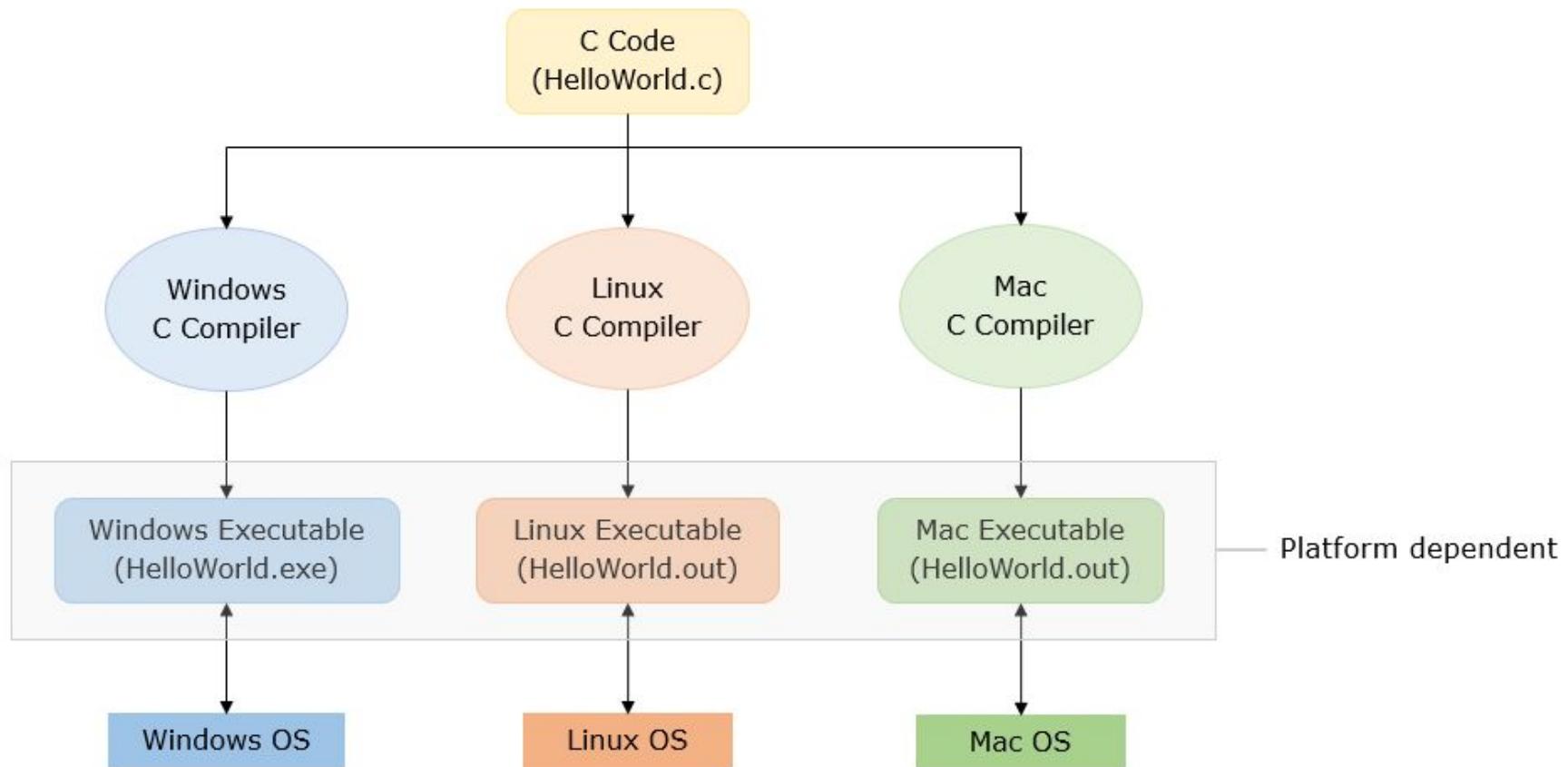


# Features of Java



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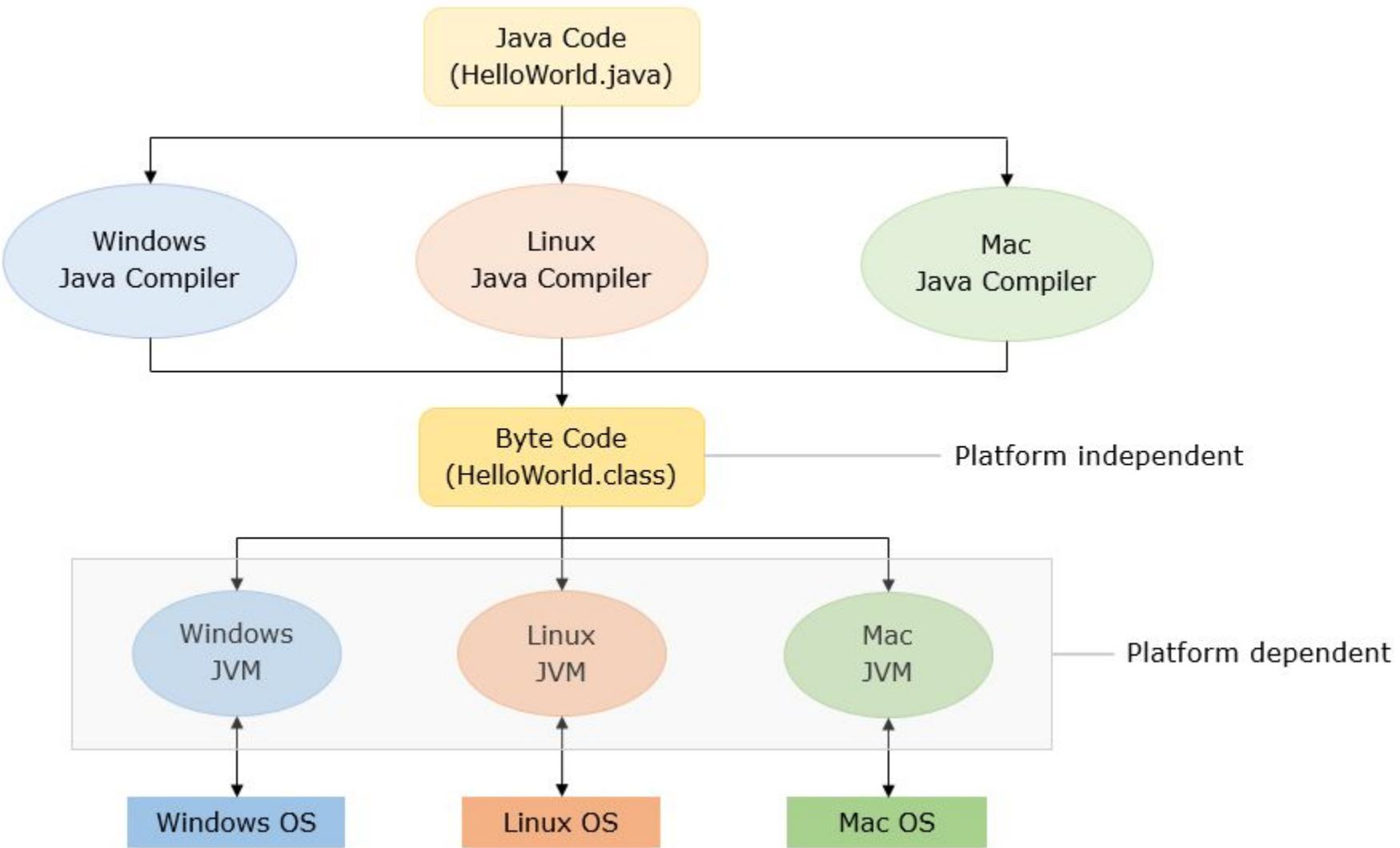
# Platform Dependent



Source: Internet

A programming language is **platform independent** if a program written once can run on **any platform without recompilation**.

# Platform Independent



Source: Internet

Java is platform-independent because **compiled bytecode runs on any JVM**, not directly on the operating system

# Key Editions of Java

Two key editions of Java are:

1. Java Standard Edition
2. Java Enterprise Edition

## **Java SE (Standard Edition)**

This edition consists of libraries for building core Java applications.

## **Java EE (Enterprise Edition)**

This edition consists of libraries for building distributed Java applications. These libraries depend on Java SE libraries

Here we will use Java SE (Standard Edition).

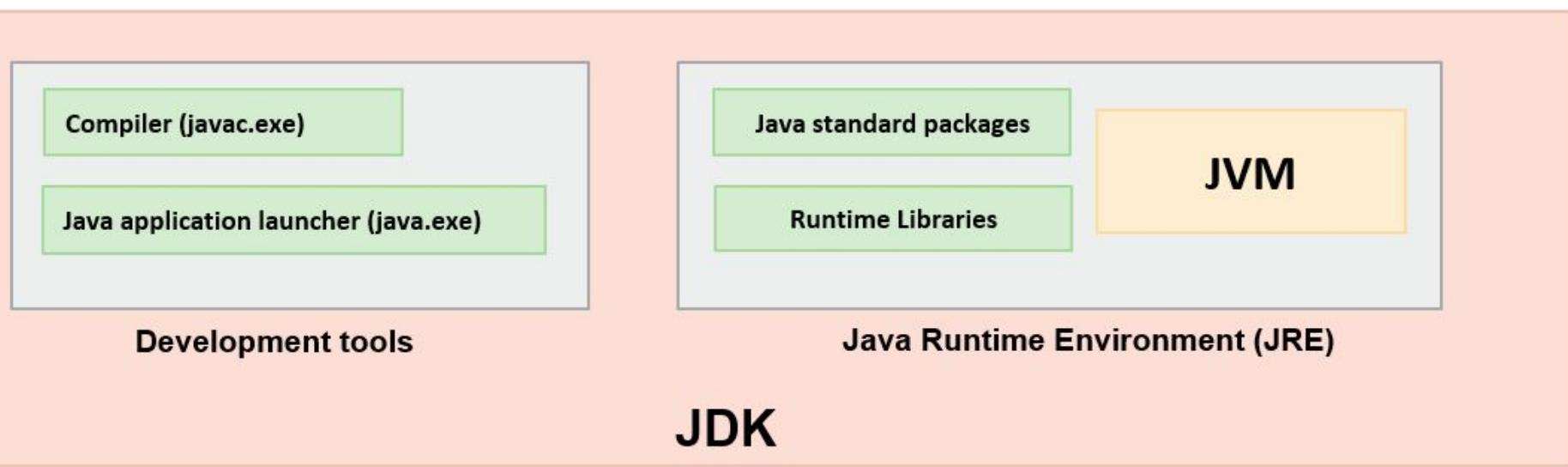
# Version of Java

Java Version	Release Year	Key Features / Changes	LTS
Java 11	2018	LTS release, <b>No separate JRE</b> , HTTP Client API, <code>var</code> in lambda	✓
Java 12	2019	Switch expressions (preview)	✗
Java 14	2020	Switch expressions (final), Records	✗
Java 17	2021	<b>LTS</b> , Sealed classes (final), strong encapsulation	✓
Java 18	2022	UTF-8 as default charset	✗
Java 19	2022	Virtual threads, structured concurrenc	✗
Java 20	2023	Performance & stability improvements	✗
Java 21	2023	<b>LTS</b> , Virtual threads (final), pattern matching enhancements	✓

# Java Development Toolkit (JDK)

Java SE is actually a Java Development Kit (JDK) that comprises of:

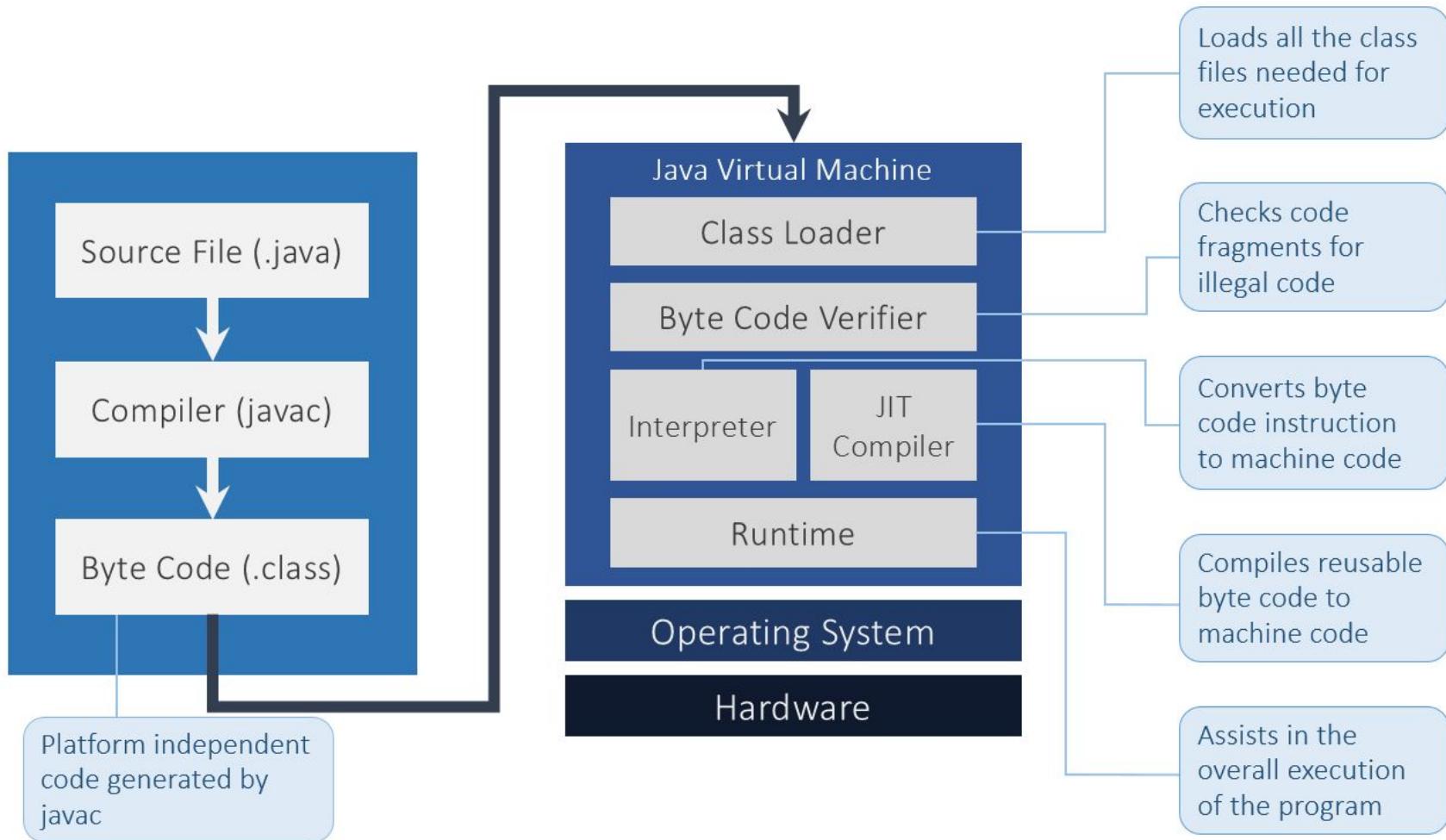
- Development Tools
- Java Runtime Environment (JRE)



Source: Internet

Note: In JDK 11 onwards there is no java Runtime Environment(JRE)  
Kitchen example

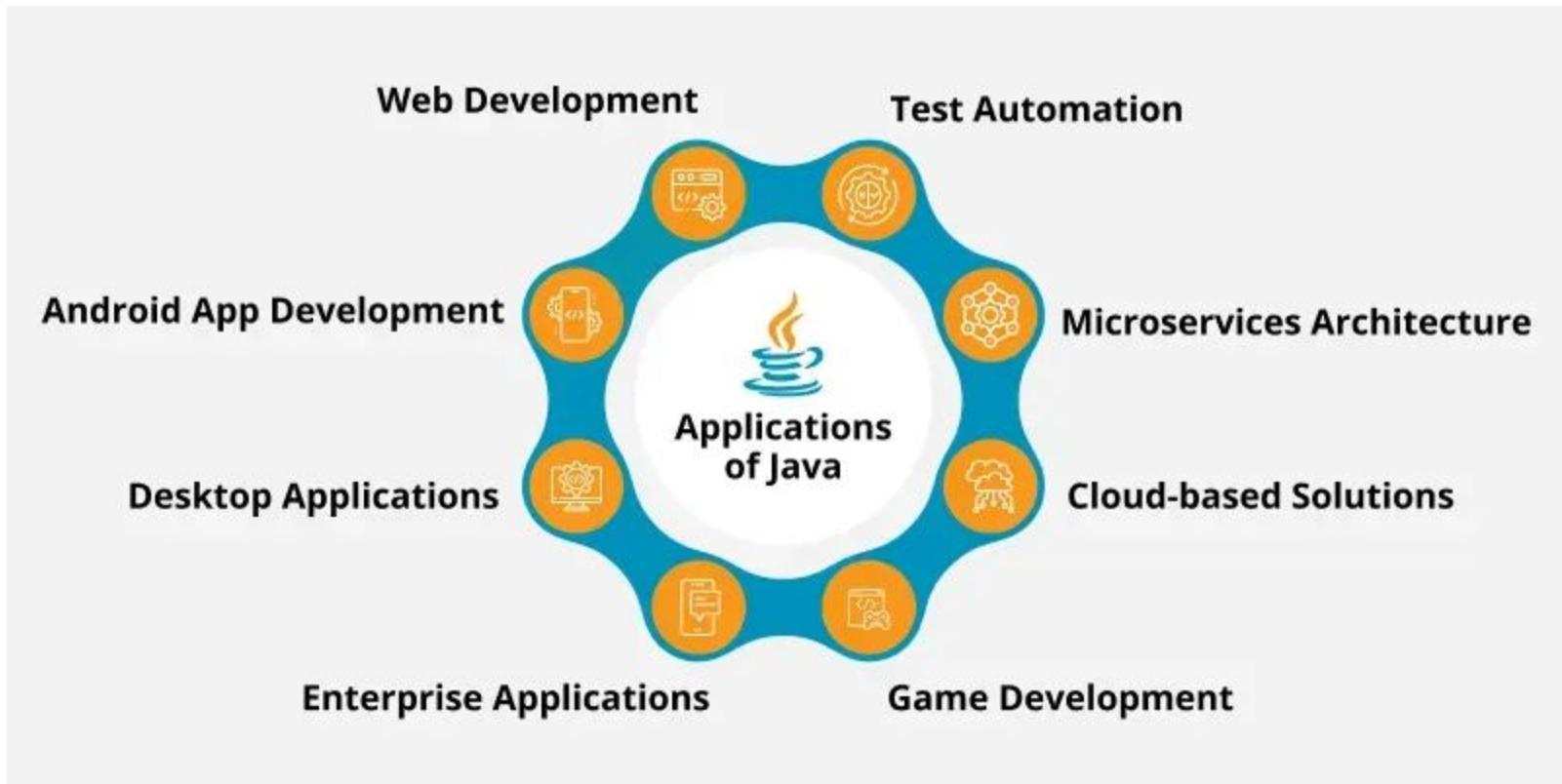
# Java Development Toolkit (JDK)



# Compiler Vs Interpreter

Feature	Compiler	Interpreter
<b>Working</b>	Translates the <b>entire program</b> at once	Translates <b>one line at a time</b>
<b>Execution Speed</b>	Faster after compilation	Slower (executes line-by-line)
<b>Error Handling</b>	Shows <b>all errors together</b> after compilation	<b>Stops at first error</b> it encounters
<b>Output File</b>	Creates a <b>separate file</b> (e.g., <code>.class</code> , <code>.exe</code> )	Does <b>not create a separate file</b>
<b>Examples</b>	<code>javac</code> (Java compiler), <code>gcc</code> (C compiler)	JVM, Python, JavaScript
<b>Use in Java</b>	Used to <b>compile Java code to bytecode</b>	JVM interprets the bytecode

# Applications of Java



Source: Internet

# Java Development Environment Setup

1. Download JDK (Version 11 or higher) for your OS (Windows/macOS/Linux)
2. Link:<https://www.oracle.com/in/java/technologies/javase/jdk11-archive-downloads.html>
3. [Archived OpenJDK GA Releases](#)
4. Set Up Environment Variables.
5. Verify Installation
  - a. java -version
  - b. javac -version

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# Compilation & Execution of a Java Program

Write Your First Java Program

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

Compile and Run the Code

```
javac Hello.java // Compiles the code  
java Hello // Runs the compiled code
```

Output:

Hello, Java!

# Assignments

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1. Find out differences between JDK and JRE and JVM?
2. Why Java called a platform-independent language?
3. Write a basic Java program that prints:

“Welcome to Java Programming”

4. Write a basic Java program that prints:

“This is my first Java program.”

5. What will happen if the main method is removed from a Java program?

Note: Use Notepad and command prompt to run java code.

6. Write down difference between all Java LTS version?

**THANK YOU!!**  
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