

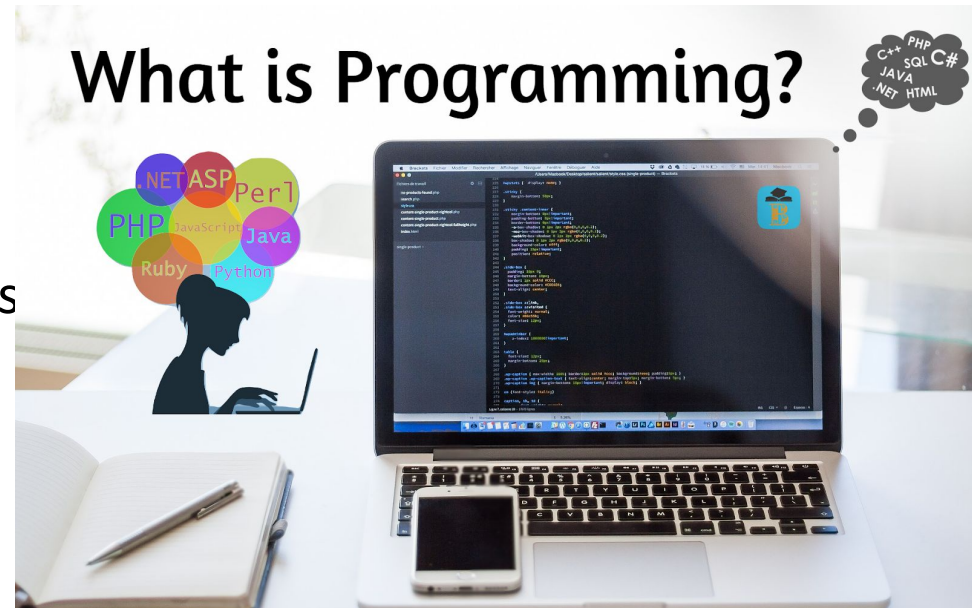


Introduction of Java

Programming ?

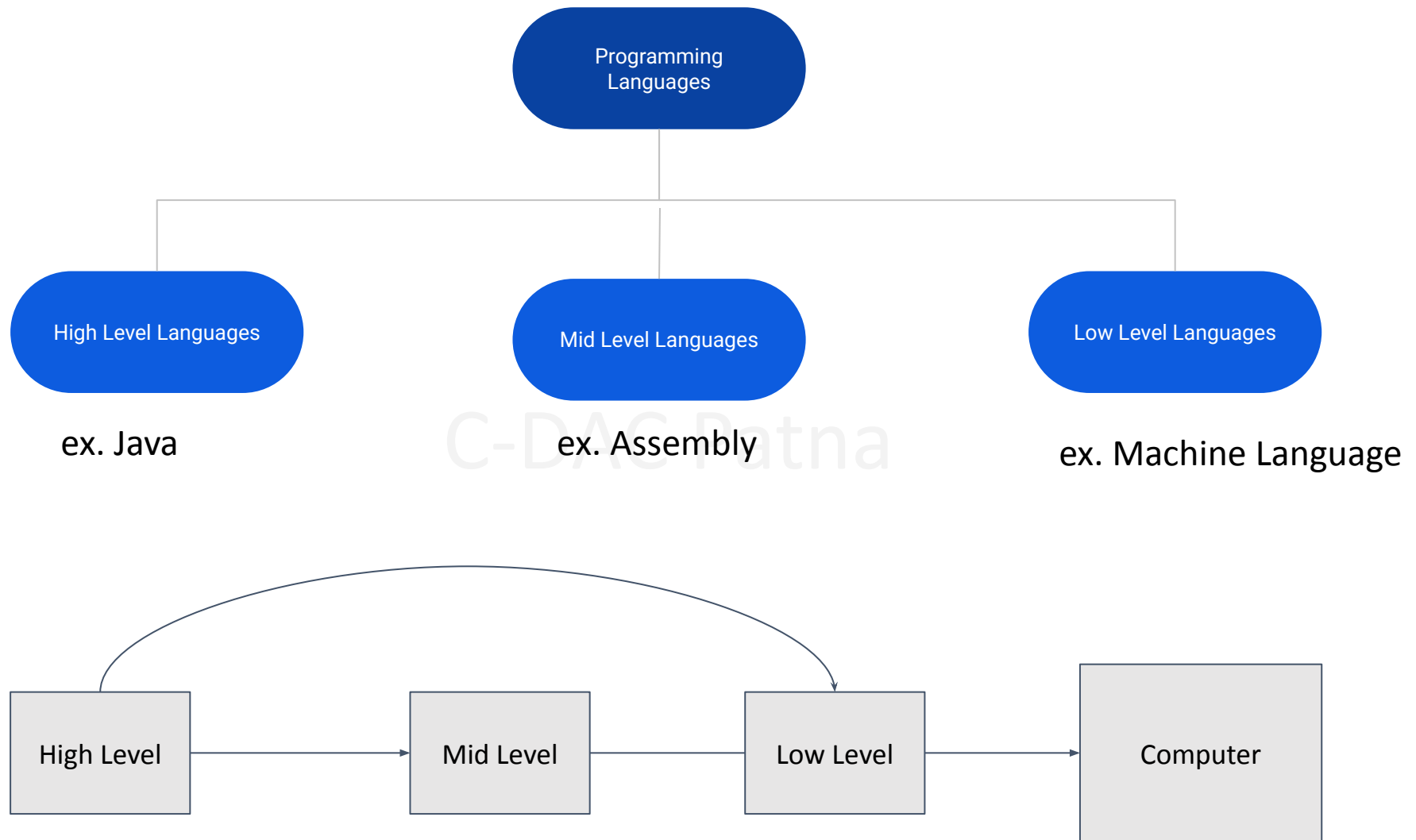
Programming is the process of giving instructions to a computer so it can perform specific tasks.

What is Programming Language ?



Source: Internet

Types of Programming Languages



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".



Source: Wikipedia

- ❑ Java's slogan was:

"Write Once, Run Anywhere" WORA

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

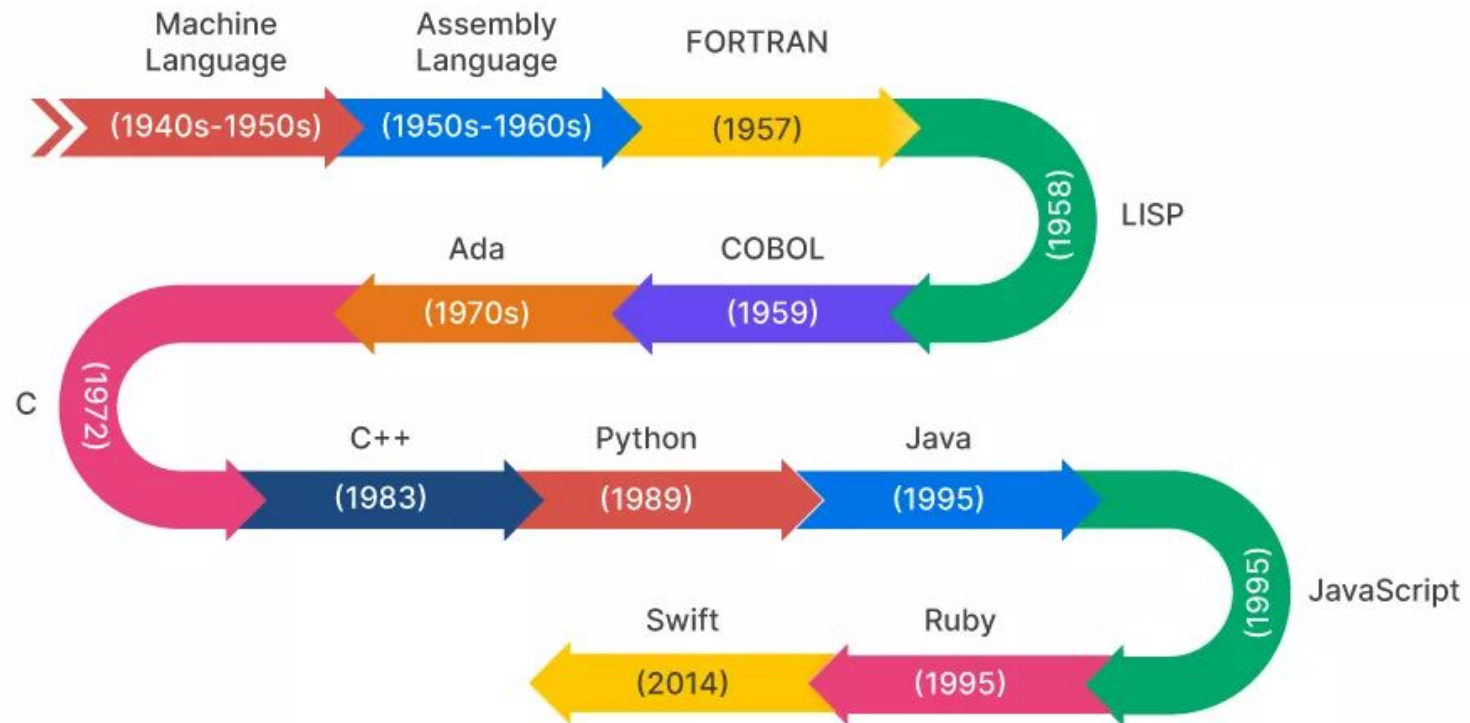
- ❑ Java is one of the most used programming languages in the world.
- ❑ Used in Android apps, web applications, banking systems, and more.

History of Java

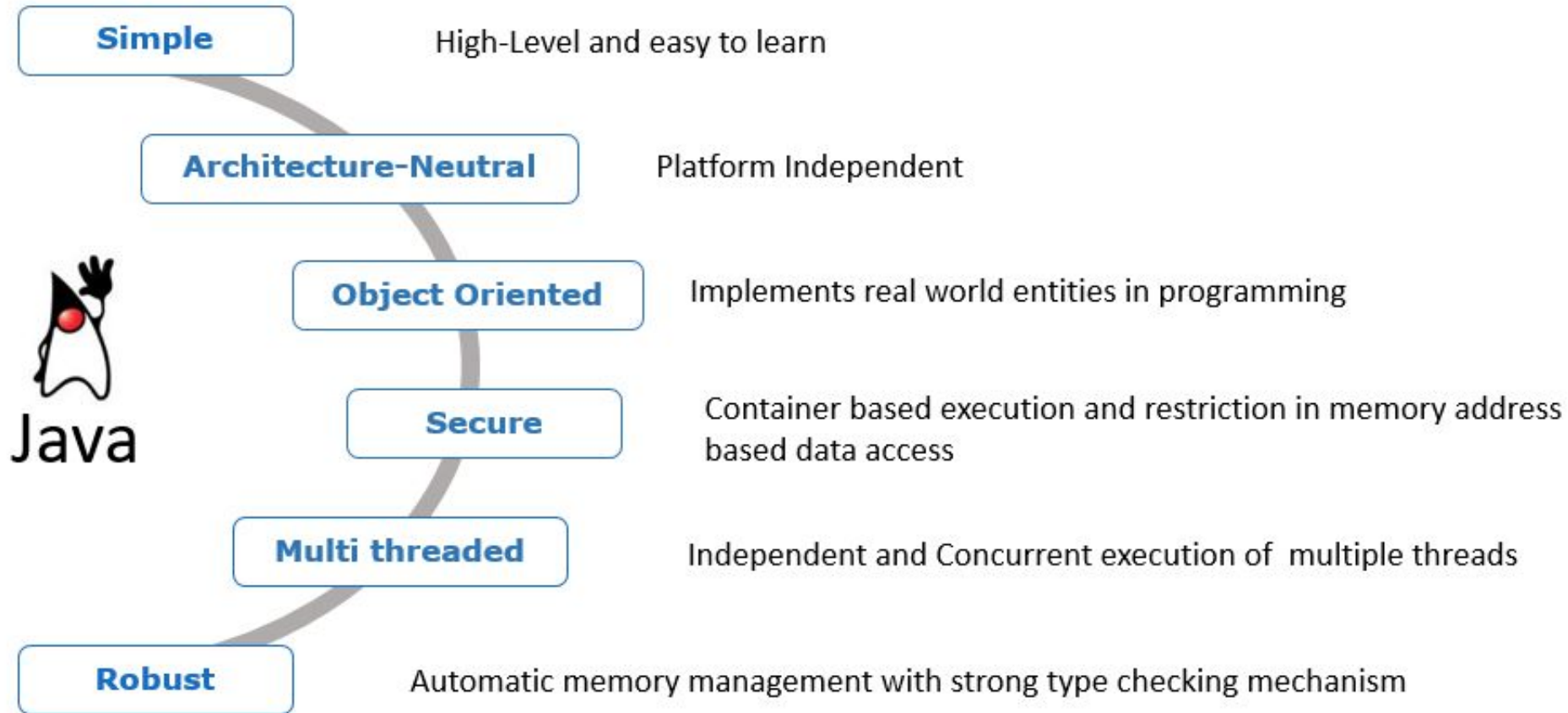
Year	Milestone
1991	Project started (called Oak)
1995	Java 1.0 released by Sun Microsystems
1996	First official Java version (Java Development Kit 1.0)
2006	Java became open-source
2010	Oracle acquired Sun Microsystems
2011-2023	Multiple versions: Java 7 → 8 → 11 → 17 → 21 (Long Term Support)

We will use java 11 here.

History

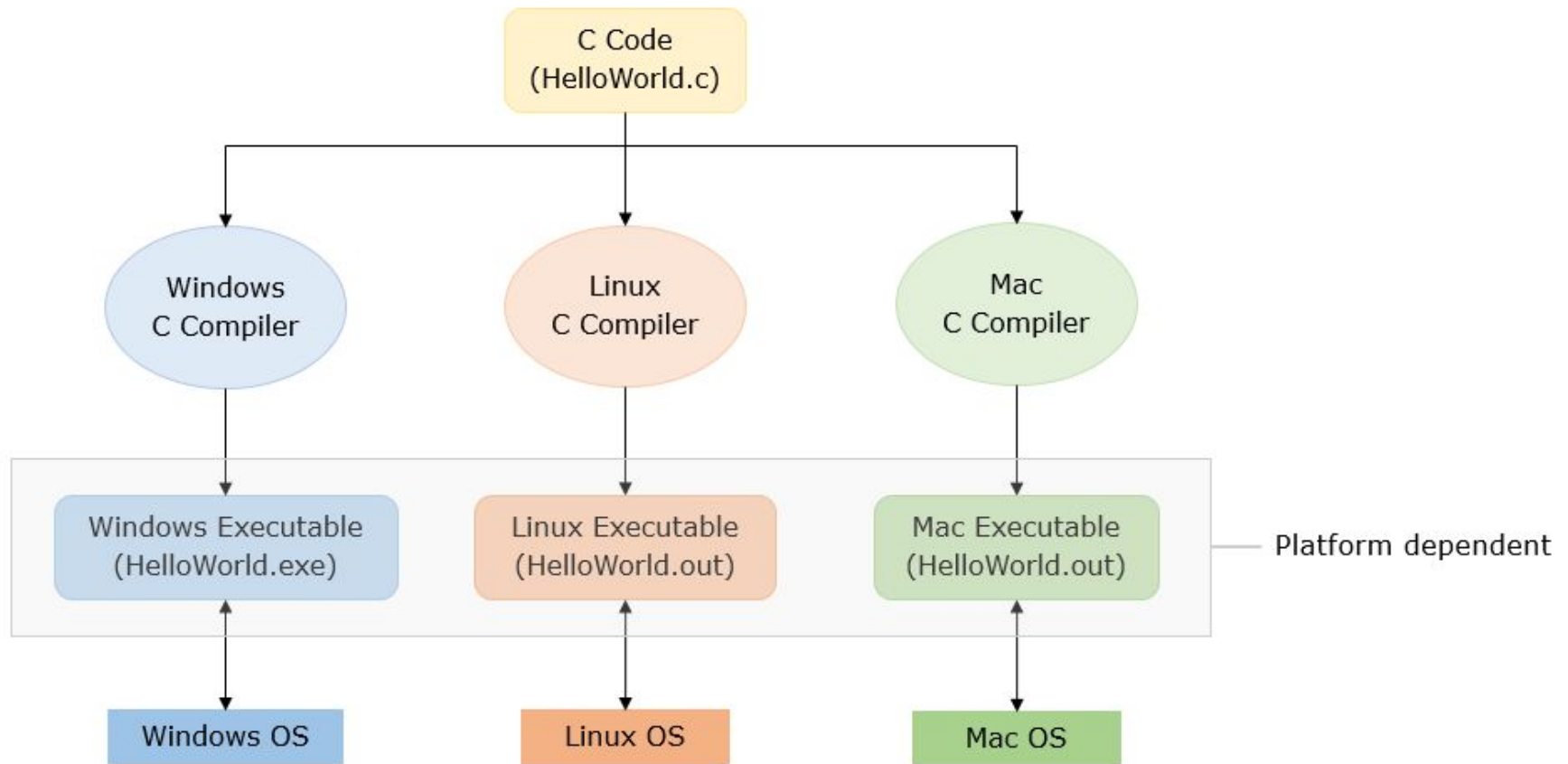


Features of Java



Source: Internet

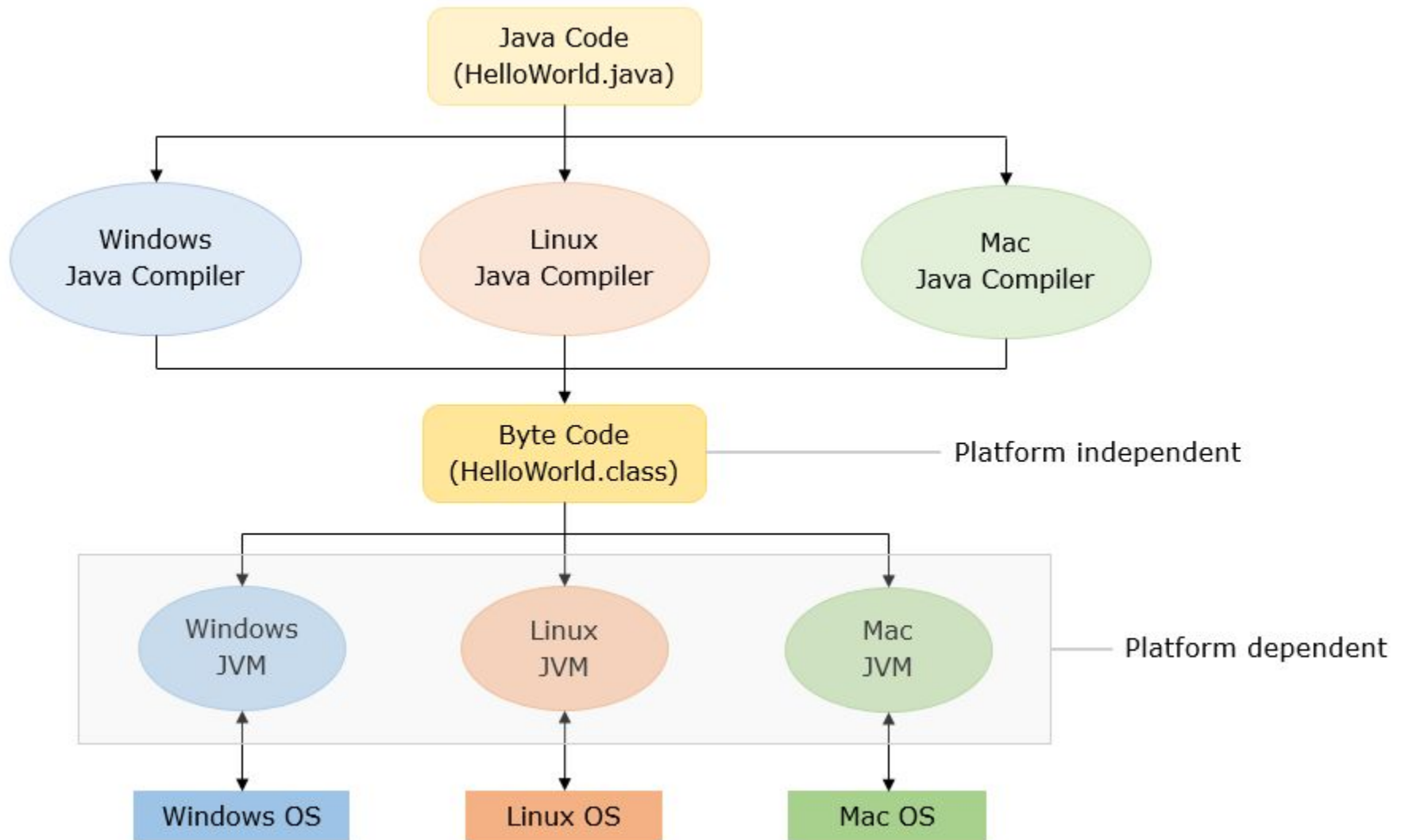
Platform Dependent



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).

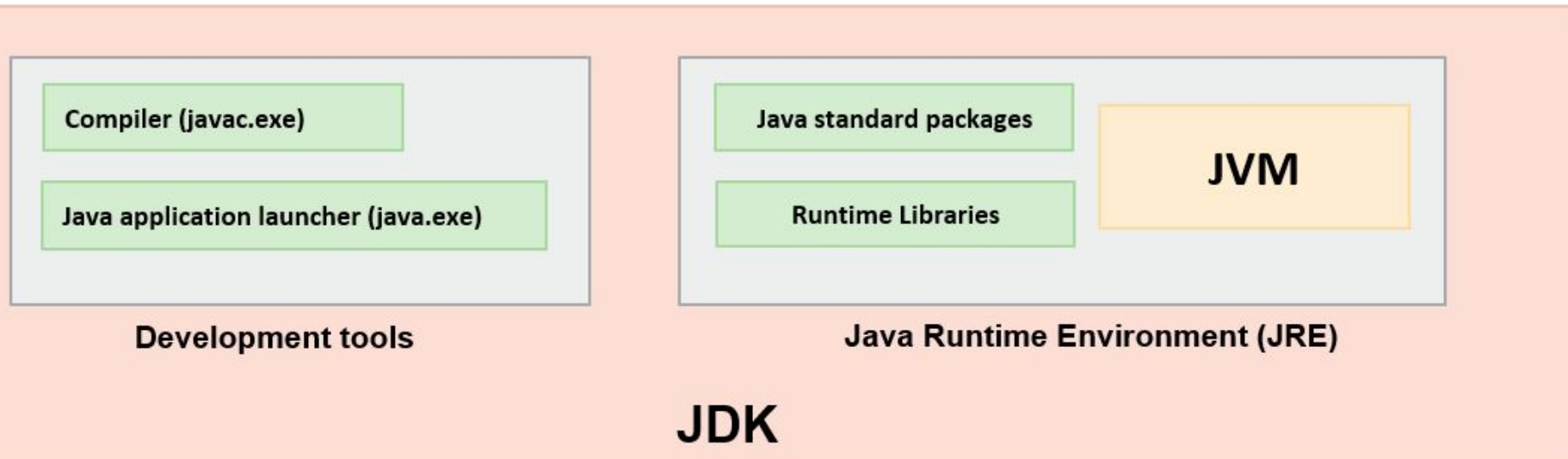
Version of Java

Java Version	Release Year	Key Features / Changes	LTS
Java 11	2018	LTS release, No separate JRE , HTTP Client API, var in lambda	✓
Java 12	2019	Switch expressions (preview)	✗
Java 14	2020	Switch expressions (final), Records	✗
Java 17	2021	LTS , 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	LTS , Virtual threads (final), pattern matching enhancements	✓

Java Development Toolkit (JDK)

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

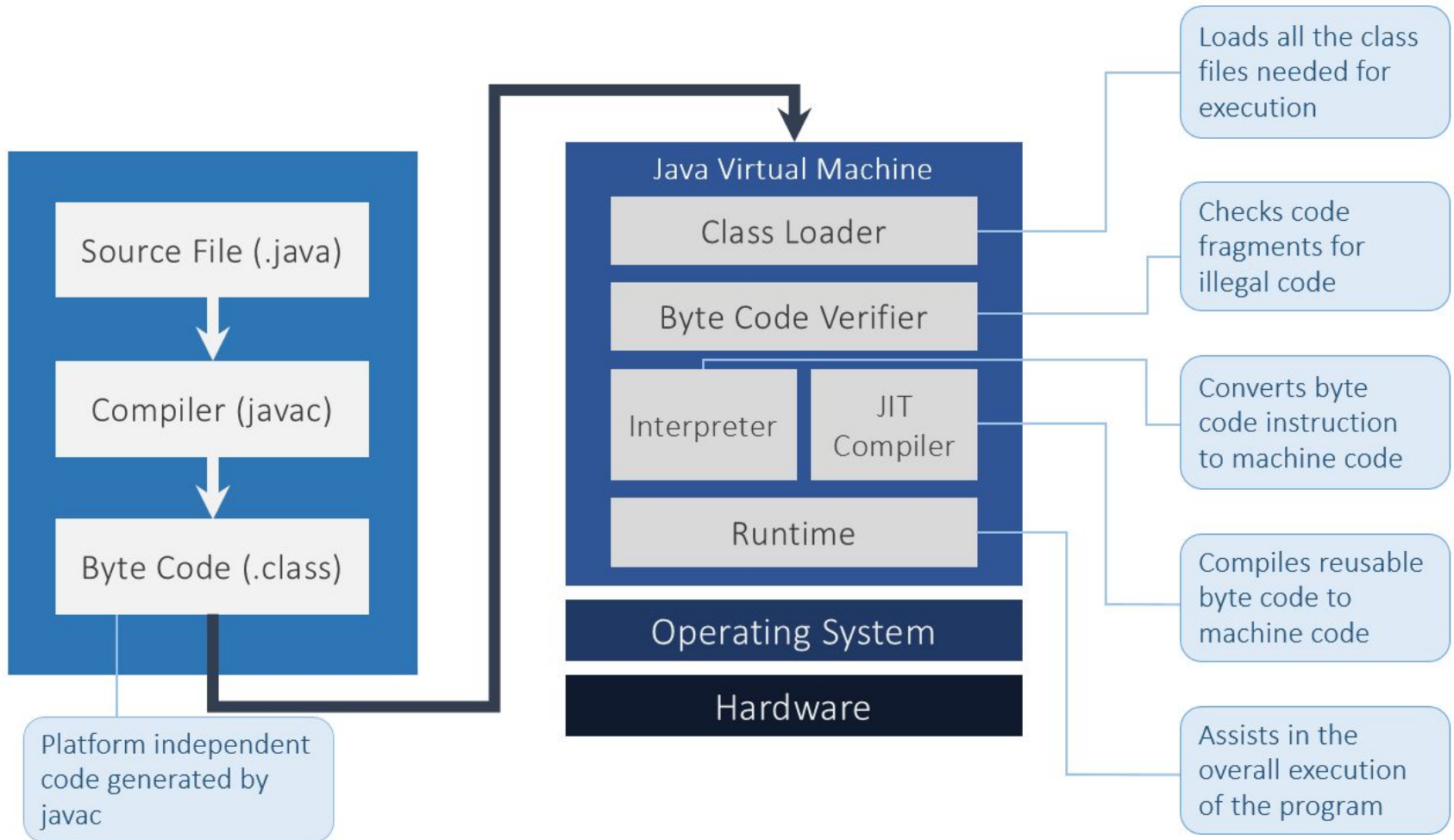
- ❑ Development Tools
- ❑ Java Runtime Environment (JRE)



Source: Internet

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

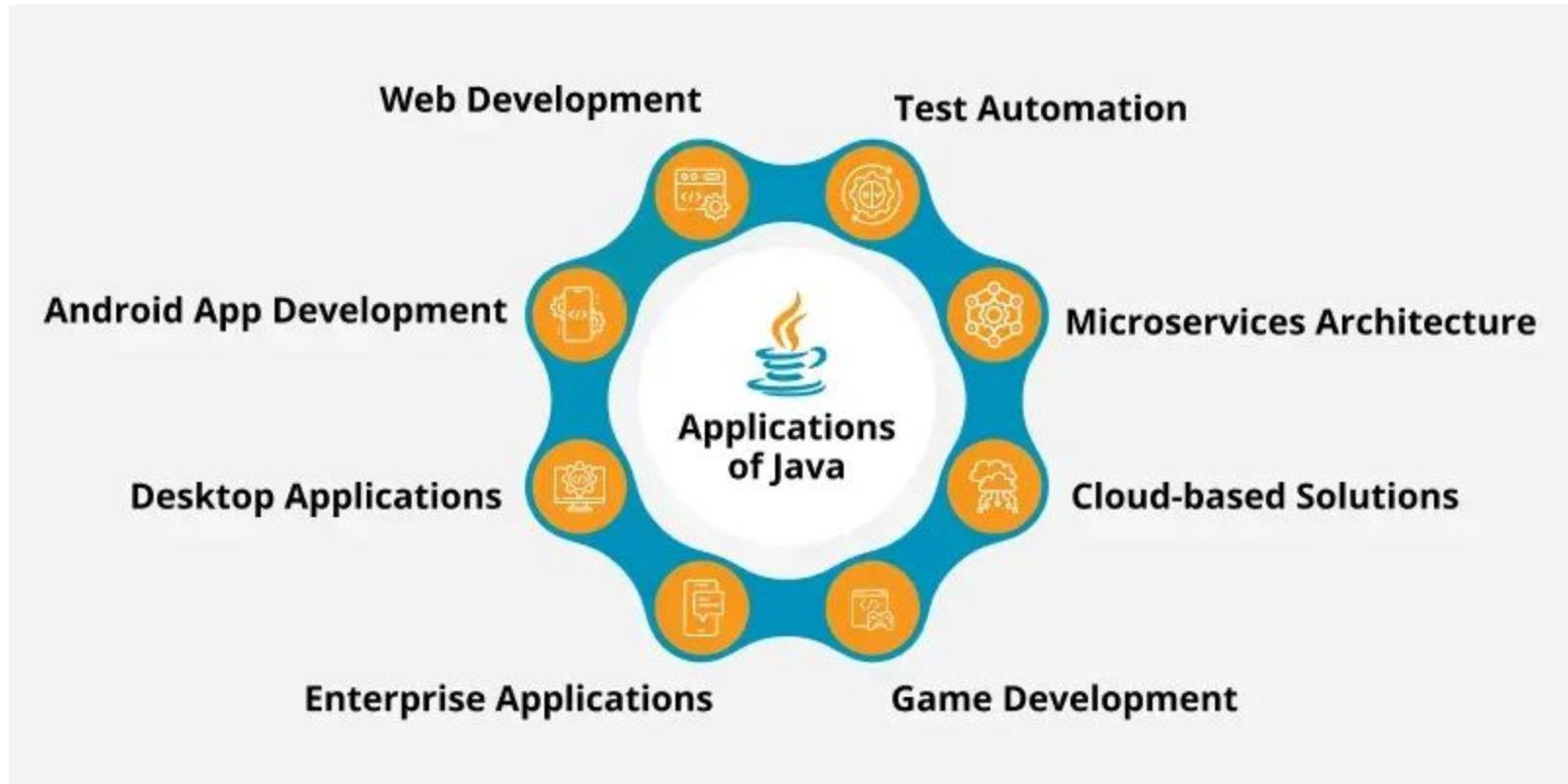
Java Development Toolkit (JDK)



Source: Internet

Compiler Vs Interpreter

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



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>
or
3. [Archived OpenJDK GA Releases](#)
4. Set Up Environment Variables.
5. Verify Installation
 - a. `java -version`
 - b. `javac -version`

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

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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