# DAY 3

**Notes on Java Installation and Configuration**

**1. Why You Need Java Software**

Java is a powerful and versatile programming language used for a wide range of applications. You need to install the **Java Development Kit (JDK)** to both write and run Java code. This includes developing **Android apps**, **web applications**, **desktop software**, and systems for **Big Data**.

**2. How to Download and Install Java**

The installation process is straightforward:

1. **Download the JDK:** Go to the official **Oracle** or **OpenJDK** website. Download the JDK installer that is compatible with your operating system (Windows, macOS, or Linux).

2. **Run the installer:** Execute the downloaded file and follow the on-screen instructions. The installer will guide you through accepting the license agreement and choosing the installation path.

**3. How to Verify Java Installation**

After installing, it's crucial to confirm that Java is correctly configured:

- Open your **Command Prompt** (Windows) or **Terminal** (macOS/Linux).

- Type the command java -version and press Enter.

- If the installation was successful, you will see the Java version number displayed. If you get an error, it means the system can't find the Java executable, which points to an issue with your environment variables.

**4. How to Set Environment Variables**

Setting environment variables allows your operating system to find and use Java commands from any folder.

**Temporarily**

This method only works for the current terminal session:

- **Windows:** set PATH=%PATH%;"C:\Program Files\Java\jdk-11\bin"

- **macOS/Linux:** export PATH=$PATH:/Library/Java/JavaVirtualMachines/jdk-11.0.1.jdk/Contents/Home/bin

**Permanently**

This is the recommended approach for persistent configuration:

- **Windows:**

  1. Search for **"Environment Variables"** in the Windows menu.

  2. Create a new **System Variable** named JAVA_HOME with the path to your JDK installation.

  3. Edit the Path variable and add a new entry: %JAVA_HOME%\bin.

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- **macOS/Linux:**

    1. Open your shell configuration file (e.g., .bash_profile, .zshrc) in a text editor.

    2. Add the export commands for JAVA_HOME and PATH.

    3. Run source on the file to apply the changes.

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**Interview Questions on Java Installation**

Here are some questions an interviewer might ask to test your knowledge of Java setup.

1. **What is the difference between JRE and JDK?**

    o **JDK (Java Development Kit)**: This is the full kit for developing Java applications. It includes the JRE and tools like the Java compiler (javac).

    o **JRE (Java Runtime Environment)**: This is a subset of the JDK. It only contains what's needed to run Java applications, including the JVM and class libraries, but not the development tools.

    o *Answer:* To develop Java programs, you need the **JDK**. To just run them, you only need the **JRE**.

2. **Why do you need to set the JAVA_HOME and Path environment variables?**

    o *Answer:* The JAVA_HOME variable points to the root directory of your JDK installation. The Path variable tells the operating system where to find the Java executable files (like java and javac) so you can run them from any directory in the command line.

3. **What command do you use to verify your Java version? What does it tell you?**

    o *Answer:* The command is java -version. It confirms that Java is installed and configured correctly and displays the specific version number.

4. **What does "Write once, run anywhere" mean in the context of Java?**

    o *Answer:* This slogan refers to Java's platform independence. Java code is compiled into **bytecode**, which can then be executed on any device with a **Java Virtual Machine (JVM)**, regardless of the underlying operating system.