Java Introduction & Setup

1. Introduction:

Java is a high-level, class-based, object-oriented programming language widely used for building enterprise-grade applications. It is platform-independent, meaning compiled Java code can run on any device with the Java Virtual Machine (JVM).

2. Why Java and Why This Course?

- Java is used in Android development, web applications, and backend systems.
- It has a huge community, rich libraries, and strong memory management.
- This course offers a structured approach for beginners, with practical applications, interview prep, and IDE experience.

3. What is JDK, JRE, and JVM?

- JDK (Java Development Kit): A software development kit required to develop Java applications.
- JRE (Java Runtime Environment): Provides libraries and JVM for running Java applications.
- JVM (Java Virtual Machine): Abstract machine that enables Java bytecode to be executed on any device.

4. Basics About Latest Java Version:

Each new Java version brings improvements in performance, security, and syntax. New features like `var`, `switch` expressions, and records make code more expressive and modern.

5. JDK Installation:

To write and compile Java code:

- Download the JDK from Oracle's official website or OpenJDK.
- Set the JAVA_HOME environment variable.
- Verify installation using the `java -version` and `javac -version` commands.

6. First Application: Hello World

Java programs are structured into classes and methods.

Example:

```
public class HelloWorld {
    public static void main(String[] args) {
```

```
        System.out.println("Hello, World!");
    }
}
```

7. Homework: .bat File Creation

A .bat file can be used to compile and run Java programs via double-click in Windows.

Sample .bat content:

```
@echo off
javac HelloWorld.java
java HelloWorld
pause
```

8. Integrated Development Environment - Eclipse Overview:

Eclipse is a popular IDE for Java:

- Code completion
- Debugging tools
- Syntax highlighting
- Integrated build and run tools

Steps:

- Download from eclipse.org
- Choose "Eclipse IDE for Java Developers"
- Import projects and use `Run` to execute

9. Comments in Java Source Code:

Comments help describe the purpose of code segments.

Types:

- Single-line: // This is a comment
- Multi-line: /* This is a comment block */
- Javadoc: /** Documentation for methods and classes */

Summary:

This section introduced Java and its tools. You learned about the JVM ecosystem, installed Java, wrote your first program, and got familiar with Eclipse. This sets the foundation for the rest of your Java learning journey.