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CODE WITH AMIT

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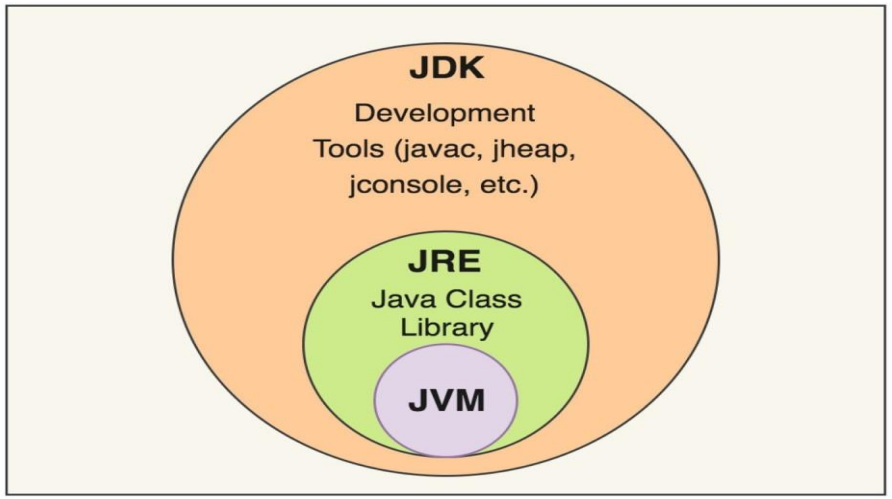
Prerequisites for Java

1. Java/JDK

- **Java Development Kit (JDK)/Java**
- JDK provides the compiler (**javac**) and **JVM** (Java Virtual Machine) to run Java programs.
- Without **JDK**, we cannot compile or run **Java** programs.

- JDK = **JRE + Development Tools**
- **JRE (Java Runtime Environment)** → Needed to run Java programs.
- **Development Tools** (compiler javac, debugger, etc.) → Needed to write and compile Java programs.

JDK | JRE | JVM



JDK (Java Development Kit):

It is used to create Java programs

(includes JRE + compiler + development tools).

JRE (Java Runtime Environment):

It provides the tools and libraries needed to run Java programs (includes JVM + libraries).

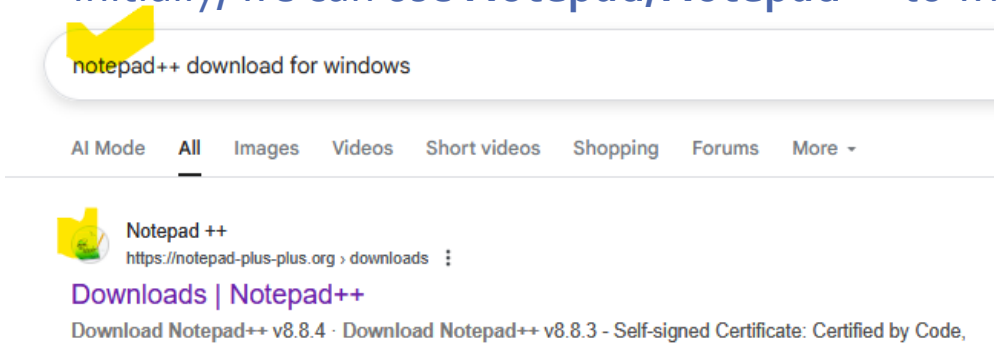
JVM (Java Virtual Machine):

It runs Java programs by converting bytecode into machine code that your computer understands.

2. Text Editor (for writing code)

JDK (Java Development Kit):

- Initially, we can use **Notepad/Notepad++** to write Java code.



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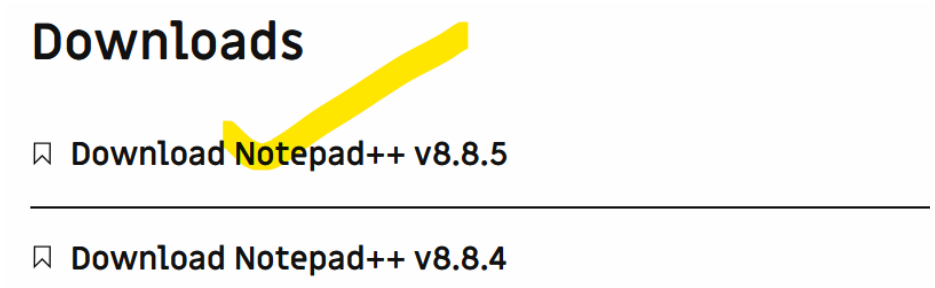

Integrated Development Environment (IDE)

Integrated Development Environment (IDE)

VS Code, **IntelliJ IDEA**, or **Eclipse** for easier coding.

- **Why IDE?**

  - Syntax highlighting
  - Auto-completion
  - Debugging support
  - Project management

  - **Note :** When we will use VS code, before that will let you know the installation process and what are the extension required for java.

Thankyou

Thankyou !

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Required extensions for Java in VS Code

1. **Extension Pack for Java** (Recommended)the extension required for java.
2. (a) **Language Support for Java™ by Red Hat**

    1. This is a bundle of all important Java extensions. Installing this single pack is enough for most cases.
    2. It includes:
    3. Provides Java **syntax highlighting.**
    4. Shows **errors** while typing.
    5. **Auto-completes code** (IntelliSense).

Example: When **we** type **System.o**, it will suggest System.out.println.

Required extensions for Java in VS Code

(b) **Debugger for Java**

- Let's we run and debug Java programs inside VS Code.
- We can set **breakpoints** to pause execution.
- Step through code line by line to find errors.
- Inspect variable values at runtime.

- **Example:** Pause the program at a loop and check the value of a variable in each iteration.

Required extensions for Java in VS Code

(c) **Java Test Runner**

- Used to run JUnit or TestNG test cases.
- Helps in unit testing directly from VS Code.

Example: If we are testing a Calculator class, we can right-click a test method → Run Test.

Required extensions for Java in VS Code

(d) Maven for Java

- Supports Maven (a build automation tool for Java projects).
- Helps manage dependencies, build lifecycle, and run goals.

Example: If our project uses pom.xml, this extension helps install required libraries automatically.

Required extensions for Java in VS Code

(e) Project Manager for Java

- Makes it easy to create and manage Java projects.
- Let's we quickly open, switch, and configure multiple projects.

Example: Create a new Java project without typing all commands manually.

Required extensions for Java in VS Code

- **Summary:**

- At minimum: Install **Extension Pack for Java** (it covers almost everything needed).
- Use **Debugger, Test Runner, and Maven** if you are working on advanced projects.

Required extensions for Java in VS Code

- Thankyou