What is JDK?

JDK stands for **Java Development Kit**. It includes:

- **Java Compiler** (javac)

- **Java Runtime Environment** (JRE)

- **Java libraries and tools** (like java, jar, etc.)

Why do we need it?
To **write**, **compile**, and **run** Java programs on your computer.

Steps to Install JDK

Step 1: Download JDK

1. Go to the official site: https://www.oracle.com/java/technologies/javase-downloads.html

2. Select the latest version (e.g., JDK 21)

3. Choose your OS: **Windows / Mac / Linux**

4. Download the .exe or installer file

Step 2: Install JDK

1. Open the downloaded file and follow the instructions.

2. Note the installation path (e.g., C:\Program Files\Java\jdk-21).

3. Set **Environment Variables**:

   o Go to **System Properties > Environment Variables**.

   o Add a new system variable:

     ▪ **Name**: JAVA_HOME

     ▪ **Value**: C:\Program Files\Java\jdk-21

   o Edit the **Path** variable and add:
     C:\Program Files\Java\jdk-21\bin

Step 3: Verify Installation

Open **Command Prompt** and type:

bash

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java -version

javac -version

If it shows version info like java 21, then you're all set!

What is an IDE?

IDE = **Integrated Development Environment**

Examples: **IntelliJ IDEA**, **Eclipse**, **NetBeans**, **VS Code**

An IDE helps you to:

- Write code with suggestions (auto-complete)

- Compile & run with one click

- Debug easily

Setting Up an IDE – Example with IntelliJ IDEA

Step 1: Download & Install

1. Go to: https://www.jetbrains.com/idea/

2. Download the **Community Edition** (free).

3. Install it like any normal app.

Step 2: Configure IntelliJ

1. Open IntelliJ.

2. Click **"New Project"**.

3. Choose **Java**, set the JDK path (auto-detected if JDK is installed).

4. Create a file: **HelloWorld.java**.

Step 3: Write and Run a Program

java

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```
public class HelloWorld {

    public static void main(String[] args) {

        System.out.println("Welcome to Java!");

    }

}
```

Click the **Run** button ▶ – your first Java output appears!

Example for Terminal Users (Without IDE)

If you're using a terminal:

1. Save the code in **Hello.java**.

2. Open the terminal in that directory.

3. Run:

bash

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javac Hello.java

java Hello

Output: Welcome to Java!

Conclusion

Tool	Purpose
JDK	Write, compile, and run Java
IDE (IntelliJ, Eclipse)	Easier coding, debugging