

Installation of Java and Simple Java Programs Aim:

To install Java Development Kit (JDK), configure the environment, and write simple Java programs including Hello World.

PRE LAB EXERCISE**QUESTIONS**

1. What is JDK and why is it required?

JDK (Java Development Kit) is a software package used to **develop Java programs**.

2. Difference between JDK, JRE, and JVM.

Term	Full Form	Purpose
JDK	Java Development Kit	Used to develop and run Java programs
JRE	Java Runtime Environment	Used to run Java programs
JVM	Java Virtual Machine	Executes Java bytecode and makes Java platform-independent

3. What is the purpose of the main() method in Java?

The **main() method** is the **starting point** of execution of a Java program.

->The JVM starts running the program from main().

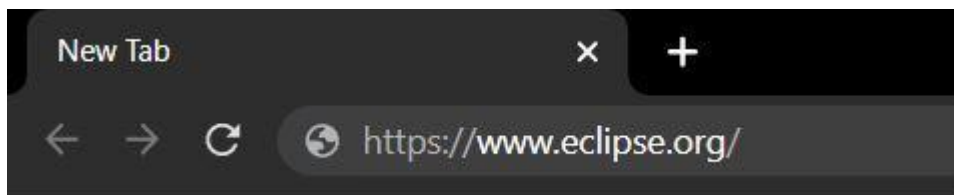
->Without main(), the program will not run.

IN LAB EXERCISE Objective:

To verify Java installation and execute a basic Java program.

INSTALLATION STEPS:**STEP 1: Open Browser**

- Open your browser and go to the official [URL](https://www.eclipse.org/) Eclipse Downloads page.



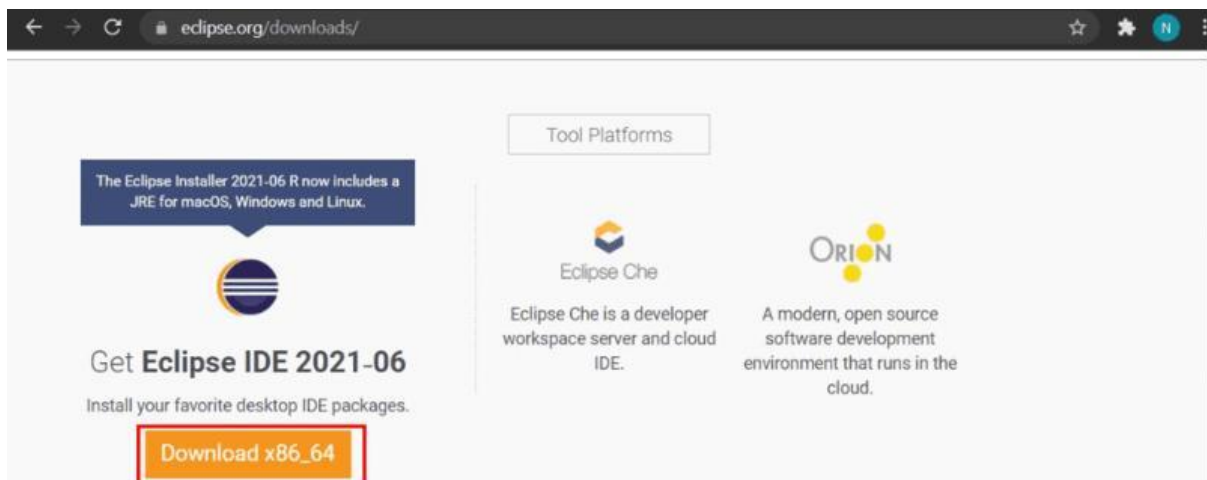
STEP 2: Download Eclipse Installer

- Then, click on the "Download" button to download Eclipse IDE.

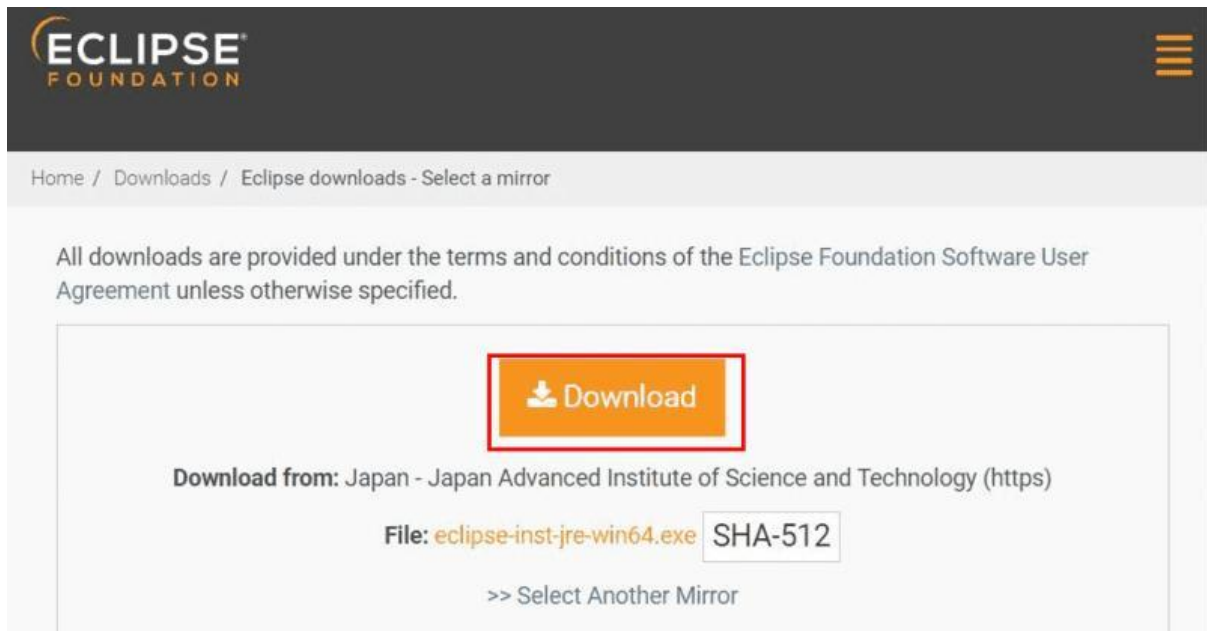


STEP 3: Download EXE

- Now, click on the "Download x86_64" button.

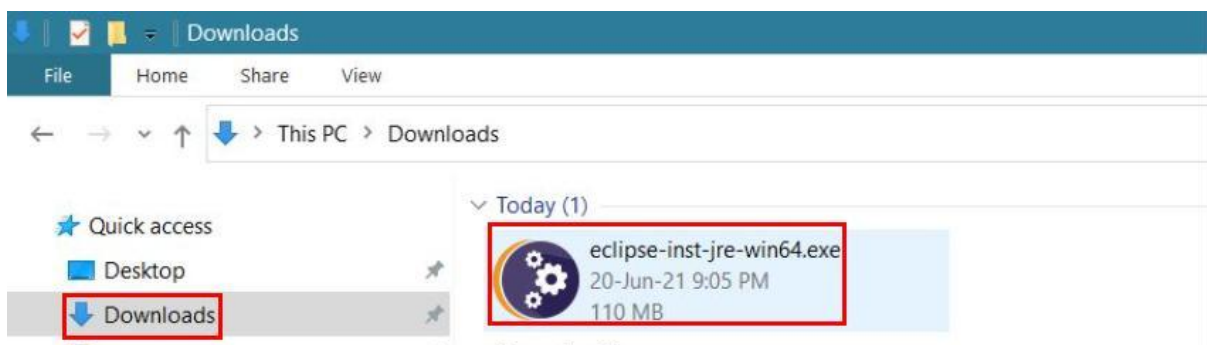


STEP 4: Then click on the "Download" button. After clicking on the download button the .exe file for the eclipse will be downloaded.



STEP 5: Open Download EXE

- Now go to File Explorer and click on "Downloads" after that click on the "*eclipseinst-jre-win64.exe*" file for installing Eclipse IDE.



STEP 6: Install Eclipse

- Then, click on "Eclipse IDE for Java Developers".

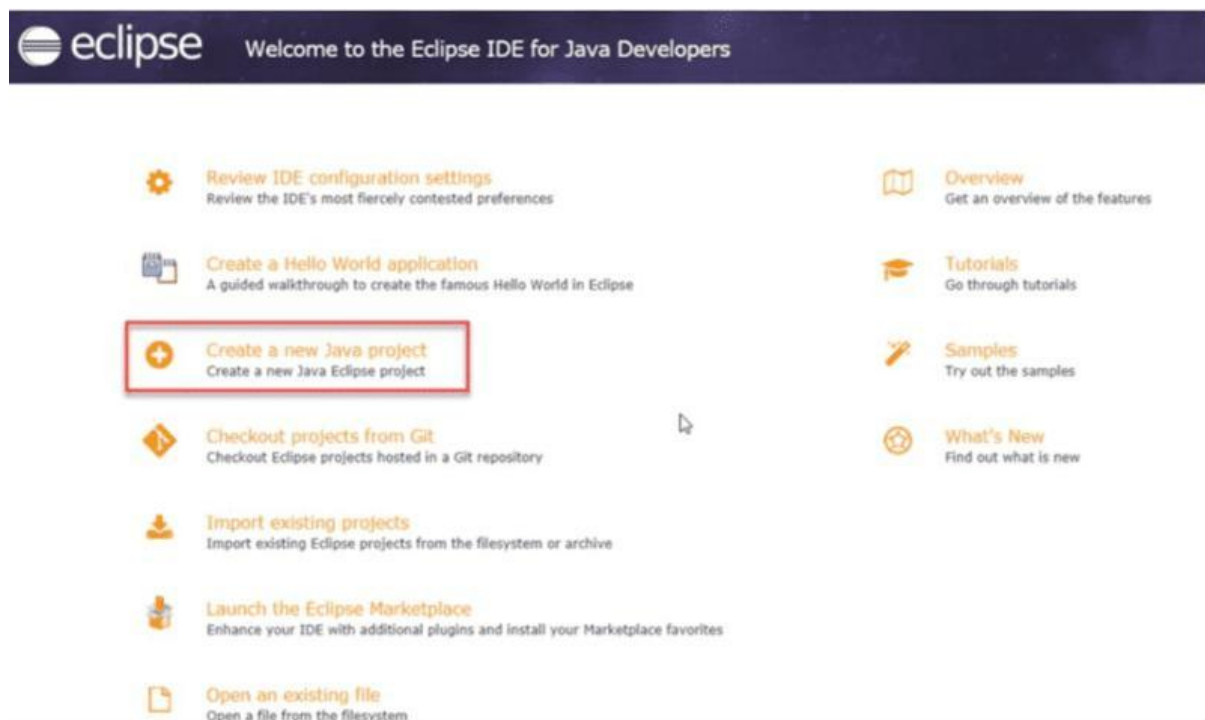


STEP 7: Then, click on the "Install" button.




Step 8: Create New Project

Now click on "Create a new Java project".



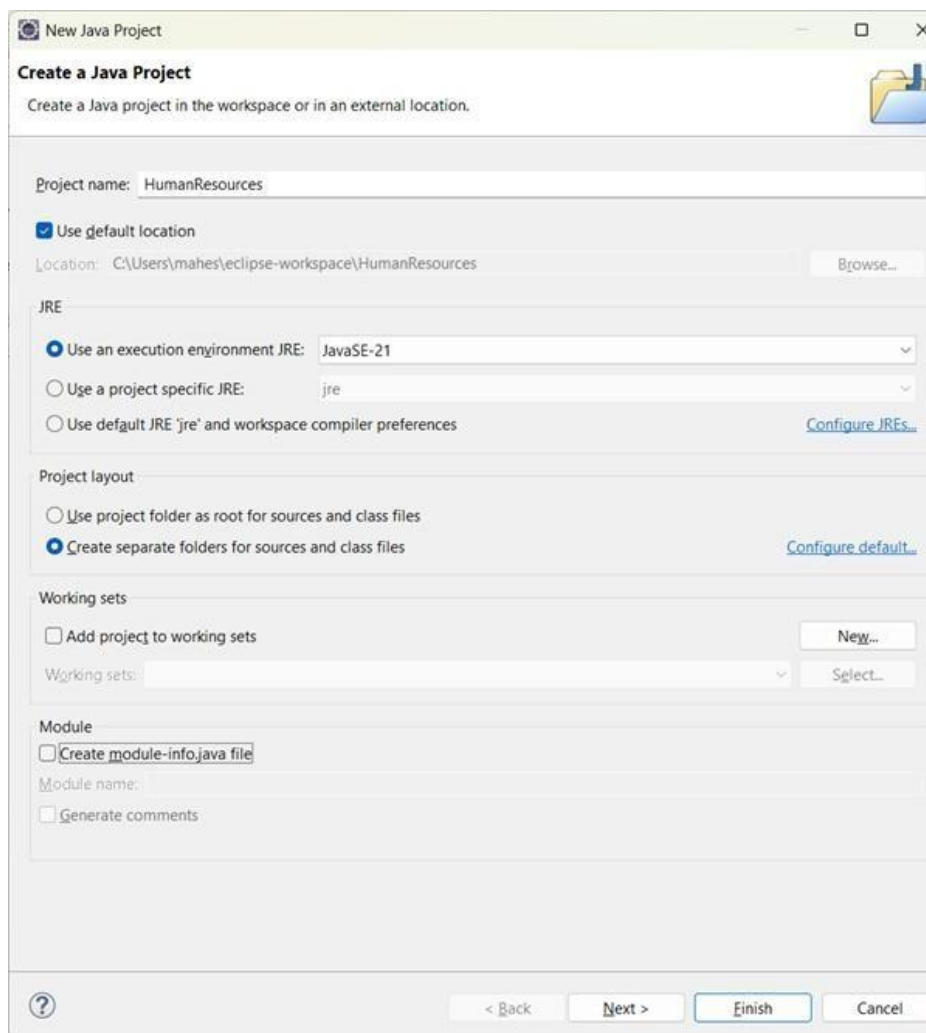
STEP 9: Create a new java project

- By clicking on the File menu and choosing New → Java Project.
- By right clicking anywhere in the Project Explorer and selecting New → Java Project.


- By clicking on the New button () in the Tool bar and selecting Java Project. **STEP**

10: Enter the Project Name

- Select the Java Runtime Environment (JRE) or leave it at the default
- Select the Project Layout which determines whether there would be a separate folder for the source codes and class files. The recommended option is to create separate folders for sources and class files.

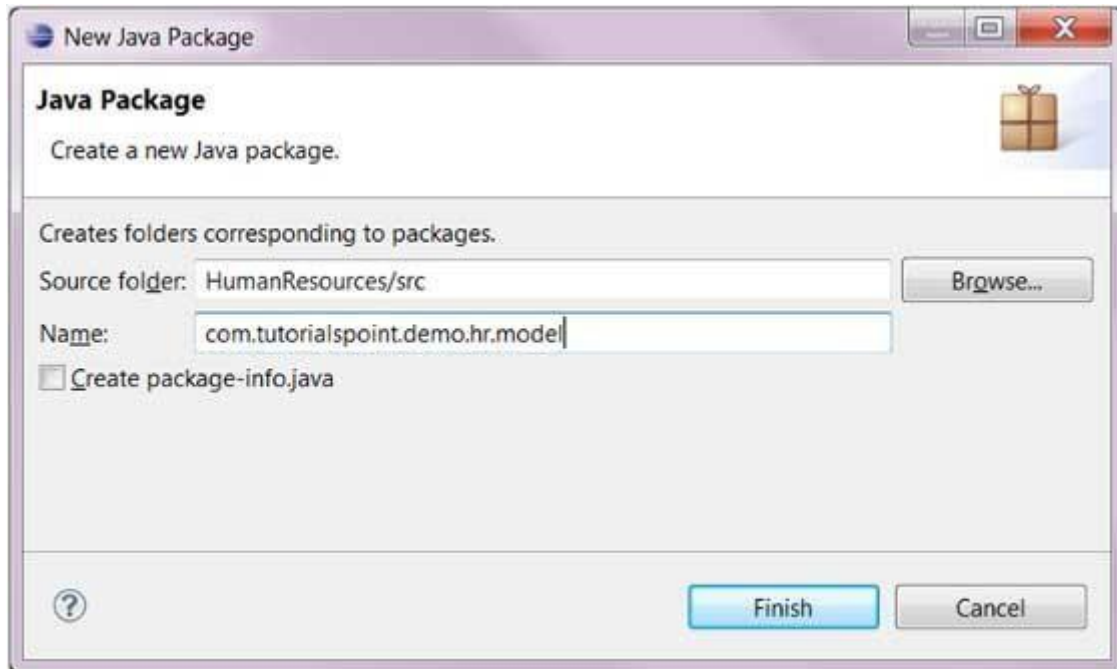


STEP 11: Create a new java package



- By clicking on the File menu and selecting New → Package.
- By right click in the package explorer and selecting New → Package.
- By clicking on the package icon which is in the tool bar ().

STEP 11:

- Enter/confirm the source folder name.
- Enter the package name.
- Click on the Finish button.

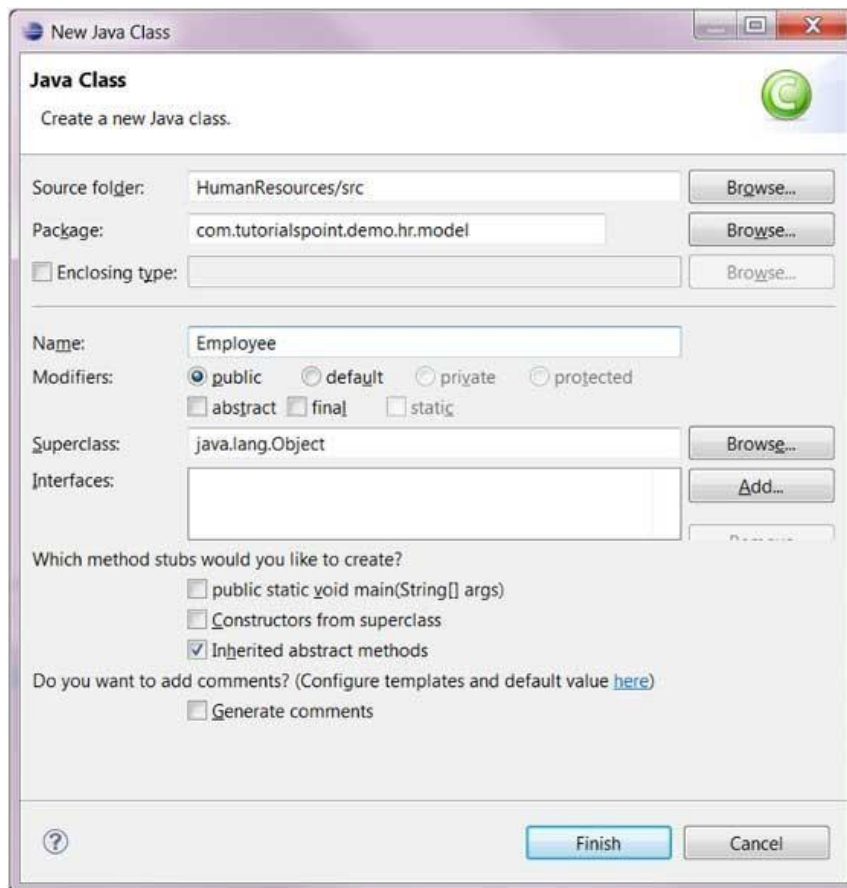


STEP 12: Create a New Java class.

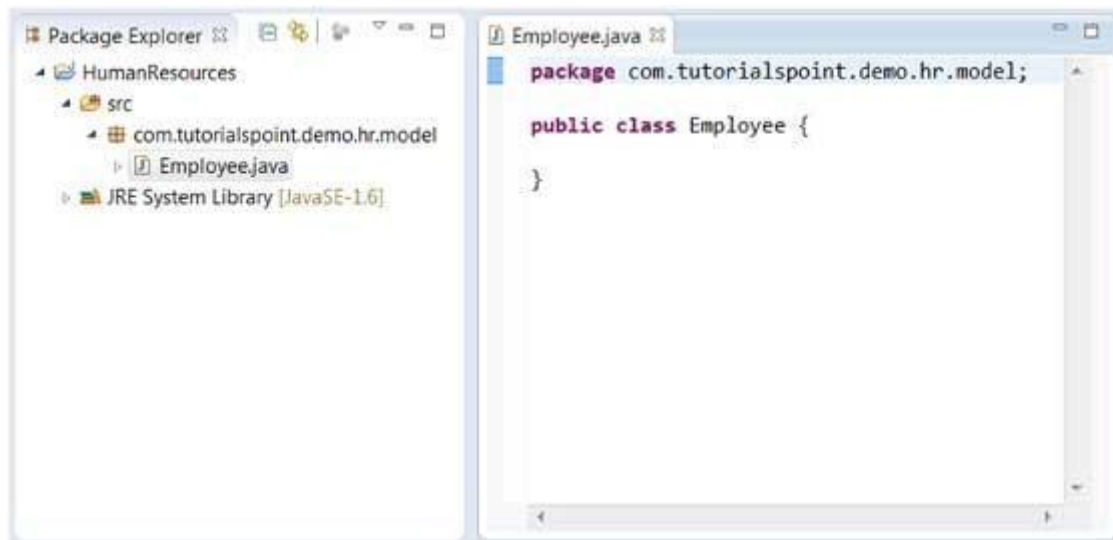
- By clicking on the File menu and selecting New → Class.
- By right clicking in the package explorer and selecting New → Class.
- By clicking on the class drop down button () and selecting class ().

STEP 13:

- Ensure the source folder and package are correct.
- Enter the class name.
- Select the appropriate class modifier.
- Enter the super class name or click on the Browse button to search for an existing class.
- Click on the Add button to select the interfaces implemented by this class.
- Examine and modify the check boxes related to method stubs and comments.



STEP 14: Class created successfully.



BASIC PROGRAMS:

Program 1: Hello World Program

Source Code:

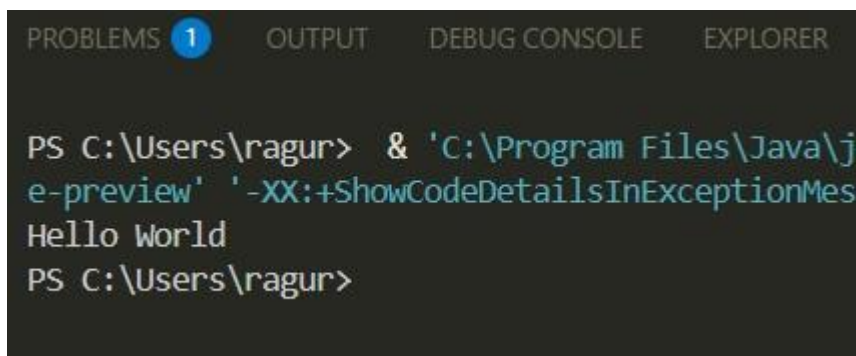
```
class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello World");  
    }  
}
```

Output:

Hello World

A screenshot of an IDE window titled 'Untitled-1.java 1 X'. The code editor shows the following Java code:

```
1 class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello World");  
4     }  
5 }  
6
```

A status bar at the bottom of the editor indicates 'Untitled-1.java is a non-project file, only syntax errors are reported'. There are also 'Run' and 'Debug' buttons visible above the code.A screenshot of a Windows command prompt window. The title bar shows 'PROBLEMS 1', 'OUTPUT', 'DEBUG CONSOLE', and 'EXPLORER'. The command prompt shows the following text:

```
PS C:\Users\ragur> & 'C:\Program Files\Java\jdk-11.0.10\bin\java.exe' -XX:+ShowCodeDetailsInExceptionMessages -XX:+ShowCodeDetailsInExceptionMessages -XX:+ShowCodeDetailsInExceptionMessages  
Hello World  
PS C:\Users\ragur>
```

Program 2: Display Personal Details Source

Code:

```
class DisplayInfo {  
    public static void main(String[] args) {  
        System.out.println("Name: Anitha");  
        System.out.println("Age: 20");  
    }  
}
```

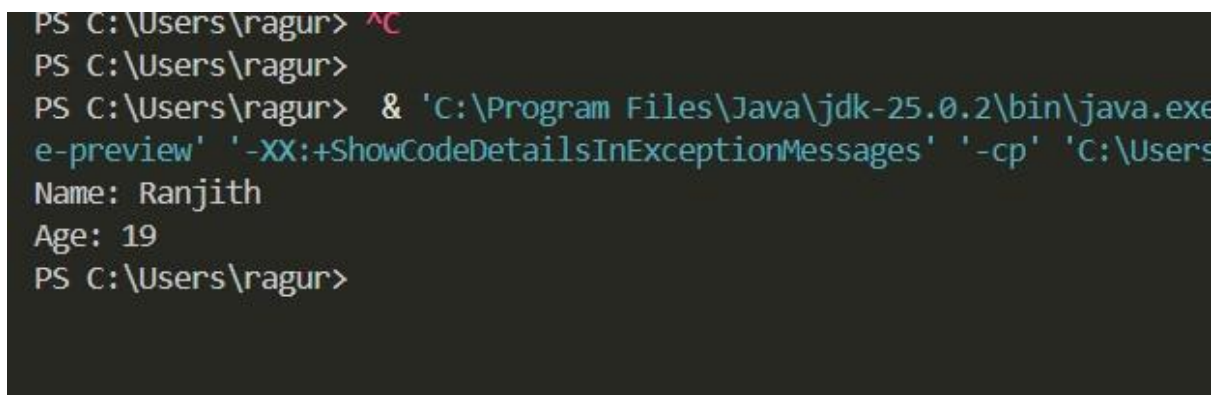
Output:

Name: Ranjith B

Age: 19

A screenshot of an IDE window titled 'Untitled-1.java 1'. The code is as follows:

```
1 class DisplayInfo {  
    Run | Debug  
2     public static void main(String[] args) {  
3         System.out.println(x: "Name: Anitha");  
4         System.out.println(x: "Age: 20");  
5     }  
6 }  
7
```

A status bar at the bottom of the editor indicates 'Untitled-1.java is a non-project file, only syntax errors are reported'.A screenshot of a Windows command prompt window. The commands and output are as follows:

```
PS C:\Users\ragur> ^C  
PS C:\Users\ragur>  
PS C:\Users\ragur> & 'C:\Program Files\Java\jdk-25.0.2\bin\java.exe  
e-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users  
Name: Ranjith  
Age: 19  
PS C:\Users\ragur>
```

Program 3: Addition of Two Numbers Source

Code:

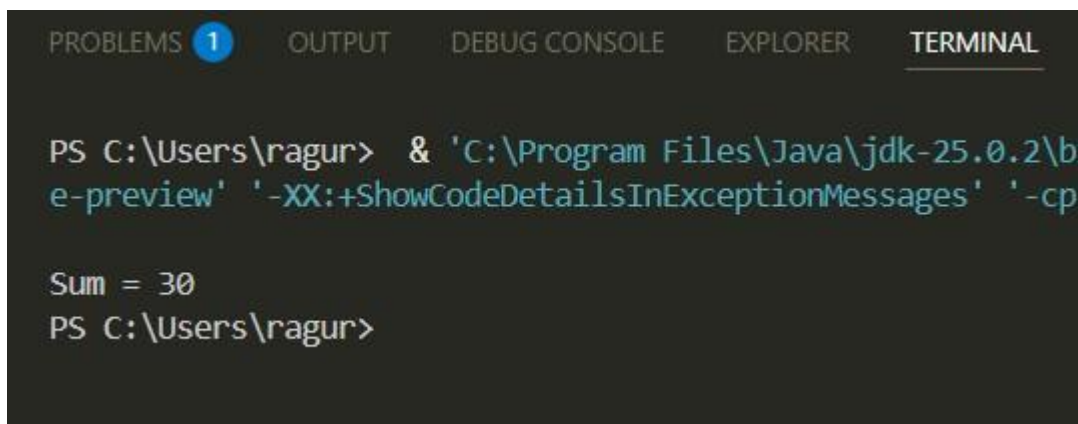
```
class AddTwoNumbers {  
    public static void main(String[] args) { int a  
        = 10, b = 20;  
        System.out.println("Sum = " + (a + b));  
    }  
}
```

Output:

Sum = 30

A screenshot of an IDE window titled 'Untitled-1.java'. The code is as follows:

```
1 class AddTwoNumbers {  
2     public static void main(String[] args) {  
3         int a = 10, b = 20;  
4         System.out.println("Sum = " + (a + b));  
5     }  
6 }  
7
```

A tooltip 'Run | Debug' is visible over the code. A message at the top right says 'Untitled-1.java is a non-project file, only syntax errors are reported'.A screenshot of a terminal window. The command entered is:

```
PS C:\Users\ragur> & 'C:\Program Files\Java\jdk-25.0.2\bin\java.exe' -XX:+ShowCodeDetailsInExceptionMessages -cp . AddTwoNumbers
```

The output shown is:

```
Sum = 30  
PS C:\Users\ragur>
```

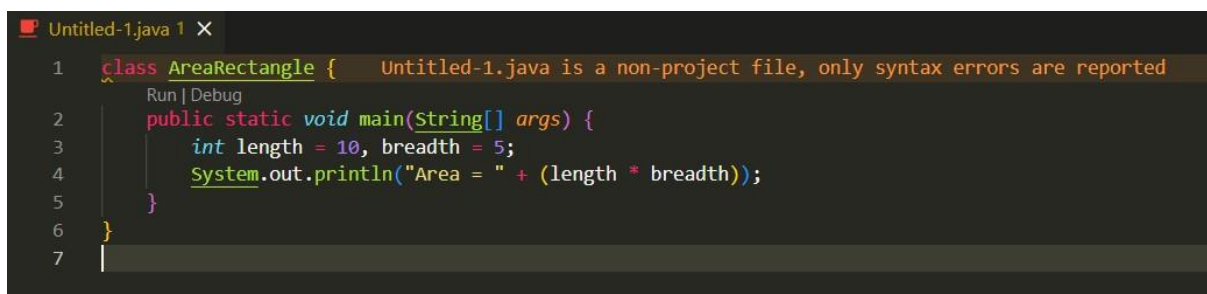
Program 4: Area of a Rectangle Source

Code:

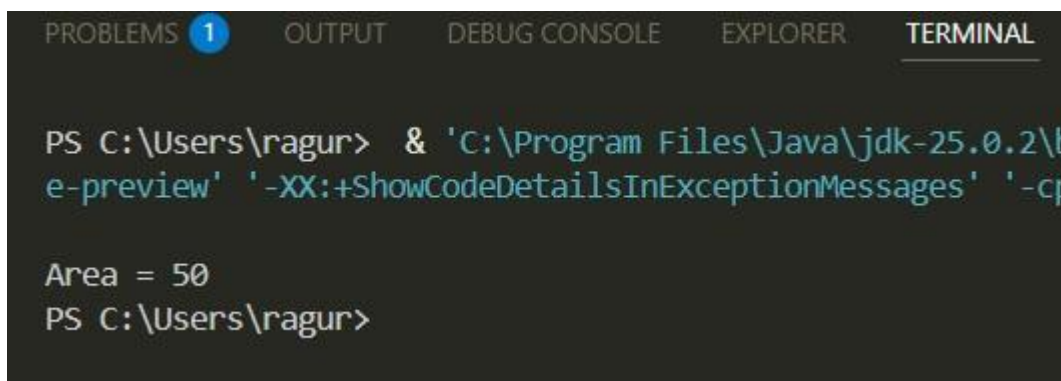
```
class AreaRectangle { public static void  
main(String[] args) { int length = 10,  
breadth = 5;  
System.out.println("Area = " + (length * breadth));  
}  
}
```

Output:

Area = 50

A screenshot of an IDE window titled 'Untitled-1.java 1'. The code is as follows:

```
1 class AreaRectangle {  
2     public static void main(String[] args) {  
3         int length = 10, breadth = 5;  
4         System.out.println("Area = " + (length * breadth));  
5     }  
6 }  
7
```

A status bar at the bottom of the editor indicates 'Untitled-1.java is a non-project file, only syntax errors are reported'.A screenshot of a terminal window. The command entered is:

```
PS C:\Users\ragur> & 'C:\Program Files\Java\jdk-25.0.2\bin\java.exe' -XX:+ShowCodeDetailsInExceptionMessages -cp . AreaRectangle
```

The output shown is:

```
Area = 50  
PS C:\Users\ragur>
```

Program 5: Simple Interest Calculation Source

Code:

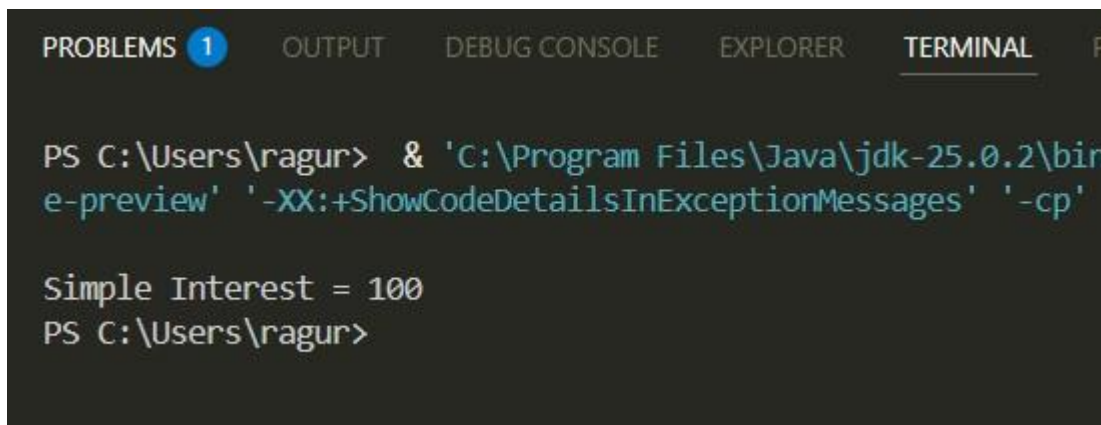
```
class SimpleInterest { public static void  
main(String[] args) { int p = 1000; int r  
= 5; int t = 2;  
int si = (p * r * t) / 100;  
System.out.println("Simple Interest = " + si);  
}  
}
```

Output:

Simple Interest = 100

A screenshot of an IDE window titled 'Untitled-1.java 1'. The code is as follows:

```
1 class SimpleInterest {  
2     public static void main(String[] args) {  
3         int p = 1000;  
4         int r = 5;  
5         int t = 2;  
6         int si = (p * r * t) / 100;  
7         System.out.println("Simple Interest = " + si);  
8     }  
9 }  
10
```

A status bar at the bottom of the editor indicates 'Untitled-1.java is a non-project file, only syntax errors are reported'.A screenshot of a terminal window with tabs for 'PROBLEMS 1', 'OUTPUT', 'DEBUG CONSOLE', 'EXPLORER', and 'TERMINAL'. The terminal shows the command to run the Java program and its output:

```
PS C:\Users\ragur> & 'C:\Program Files\Java\jdk-25.0.2\bin\java.exe' -XX:+ShowCodeDetailsInExceptionMessages -cp . SimpleInterest  
Simple Interest = 100  
PS C:\Users\ragur>
```

POST LAB EXERCISE

1. Write a Java program to display your name and department.

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

```
        System.out.println("Charaneesh A P");  
        System.out.println("AI & DS");  
    }  
}
```

2. Modify the program to print the output in same line. public class Main {

```
    public static void main(String[] args) {  
        System.out.print("Charaneesh A P ");  
        System.out.print("AI & DS");  
    }  
}
```

3. What happens if main() is written without static?

The **program will not run** because,

- The **Java Virtual Machine** cannot call the main() method.
- Java shows an error: **Main method not found.**

4. Why is Java called platform independent?

- Java uses bytecode.
- Bytecode runs on any system with JVM.

5. Write a program to find the cube of a number. public class Main {

```
    public static void main(String[] args) {        int num = 3;  
        System.out.println(num * num * num);  
    }  
}
```

Result:

Thus the Java IDE was successfully installed and a simple Java program was executed.

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	5	
In Lab Exercise	10	
Post Lab Exercise	5	
Viva	10	
Total	30	
Faculty Signature		