

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, compile, and run Java programs**.

Why it is required:

- It provides tools like **javac (compiler)** to convert Java code into bytecode.
- It includes **JRE** to run Java programs.
- It is essential for **writing, testing, and debugging** Java applications.

Without JDK, you **cannot create Java programs**.

2. Difference between JDK, JRE, and JVM.

Feature	JDK	JRE	JVM
Full form	Java Development Kit	Java Runtime Environment	Java Virtual Machine
Purpose	Develop and run Java programs	Run Java programs	Execute bytecode
Contains	JRE + development tools	JVM + libraries	Execution engine
Used by	Developers	Users	System
Includes compiler	Yes	No	No

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

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

Purpose:

- It tells the JVM **where to start the program**.
- Without main(), a Java program **cannot run**.

Syntax:

```
public static void main(String[] args)
```

Explanation:

- public → Accessible to JVM
- static → Runs without creating an object
- void → No return value
- String[] args → Accepts command-line arguments

IN LAB EXERCISE

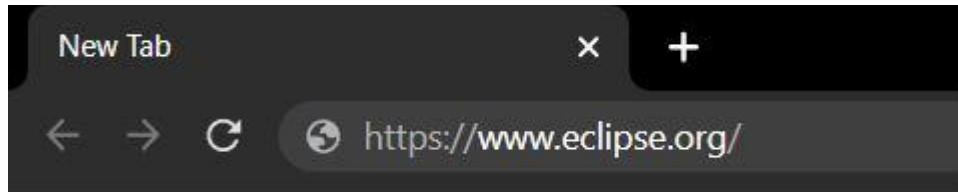
Objective:

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.



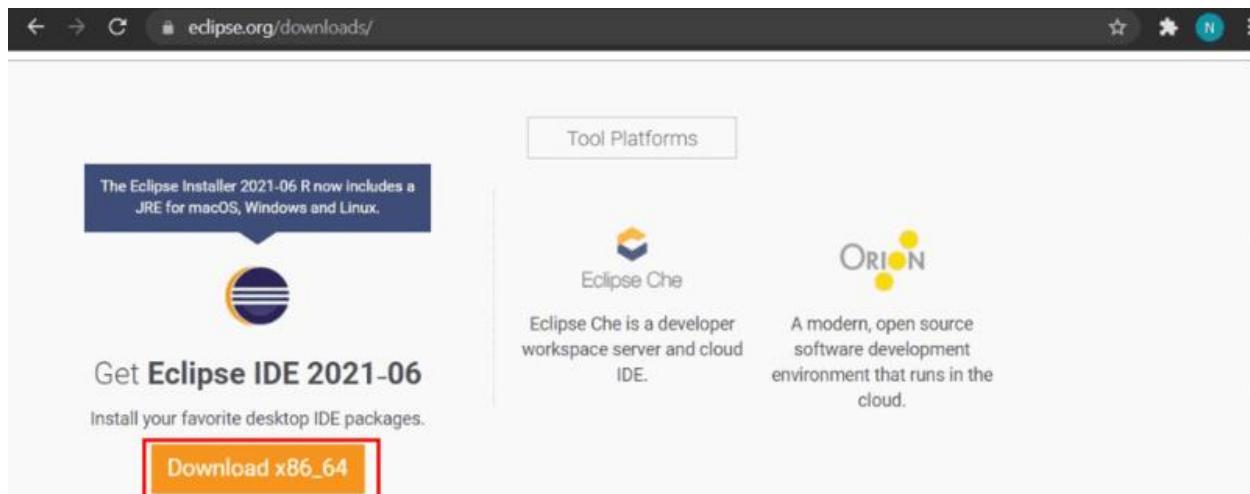
STEP 2: Download Eclipse Installer

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



STEP 3: Download EXE

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



The Eclipse Installer 2021-06 R now includes a JRE for macOS, Windows and Linux.

Tool Platforms

Eclipse IDE 2021-06

Get Eclipse IDE 2021-06

Install your favorite desktop IDE packages.

Download x86_64

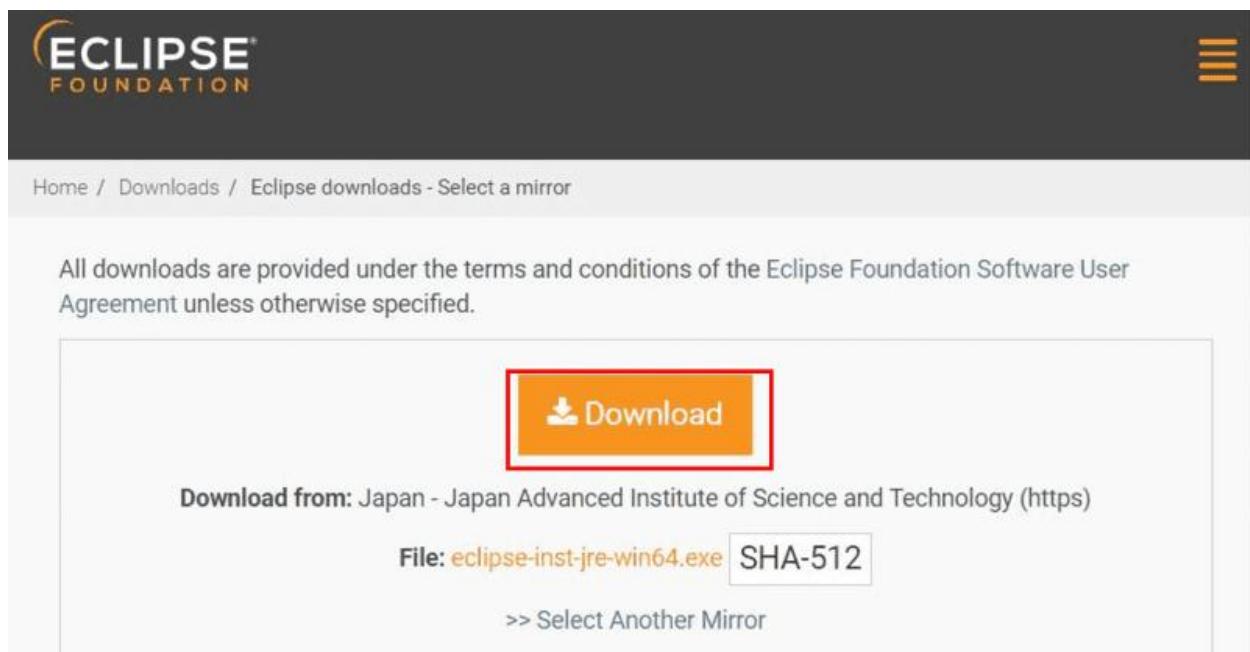
Eclipse Che

Eclipse Che is a developer workspace server and cloud IDE.

ORION

A modern, open source software development environment that runs in the cloud.

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



ECLIPSE FOUNDATION

Home / Downloads / Eclipse downloads - Select a mirror

All downloads are provided under the terms and conditions of the Eclipse Foundation Software User Agreement unless otherwise specified.

Download

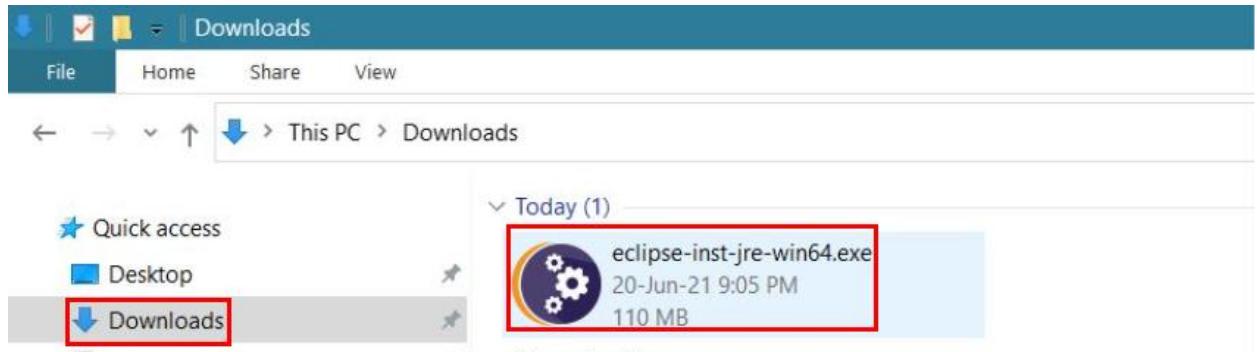
Download from: Japan - Japan Advanced Institute of Science and Technology (https)

File: [eclipse-inst-jre-win64.exe](https://download.eclipse.org/eclipse-inst/jre-win64.exe) SHA-512

>> Select Another Mirror

STEP 5: Open Download EXE

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



STEP 6: Install Eclipse

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

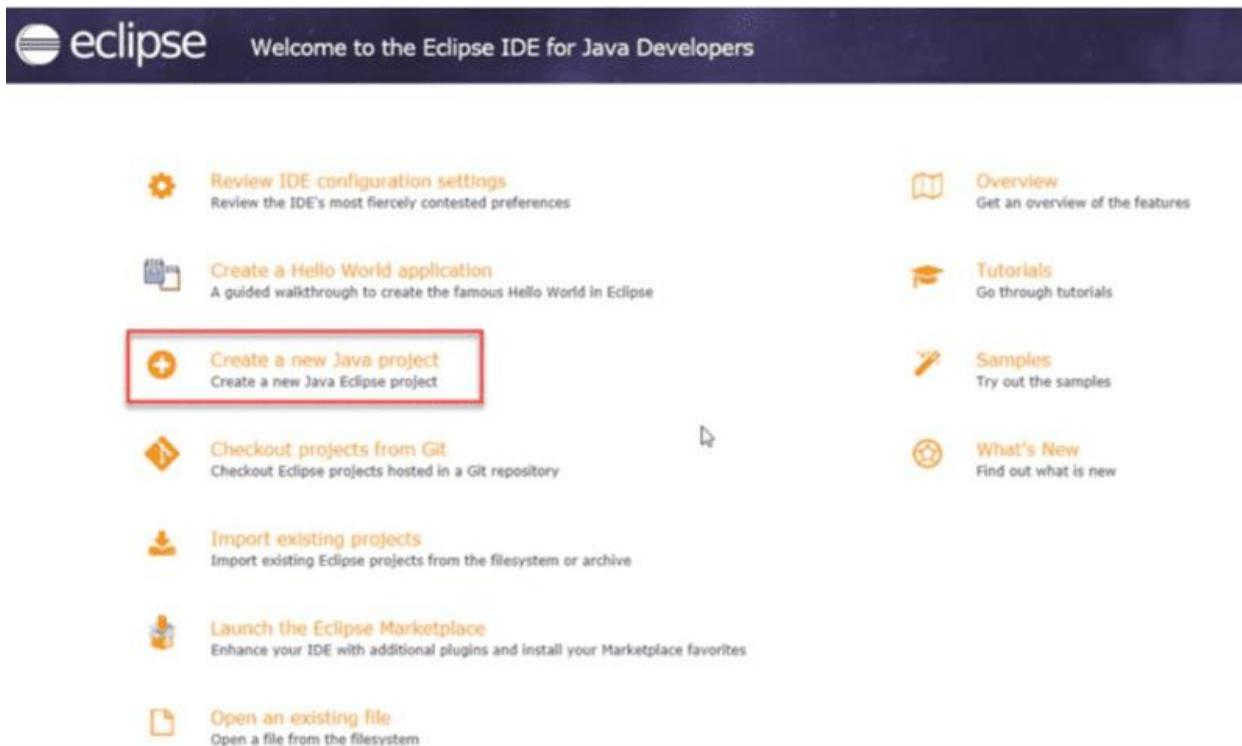


STEP 7: Then, click on the "Install" button.



Step 8: Create New Project

Now click on "Create a new Java project".

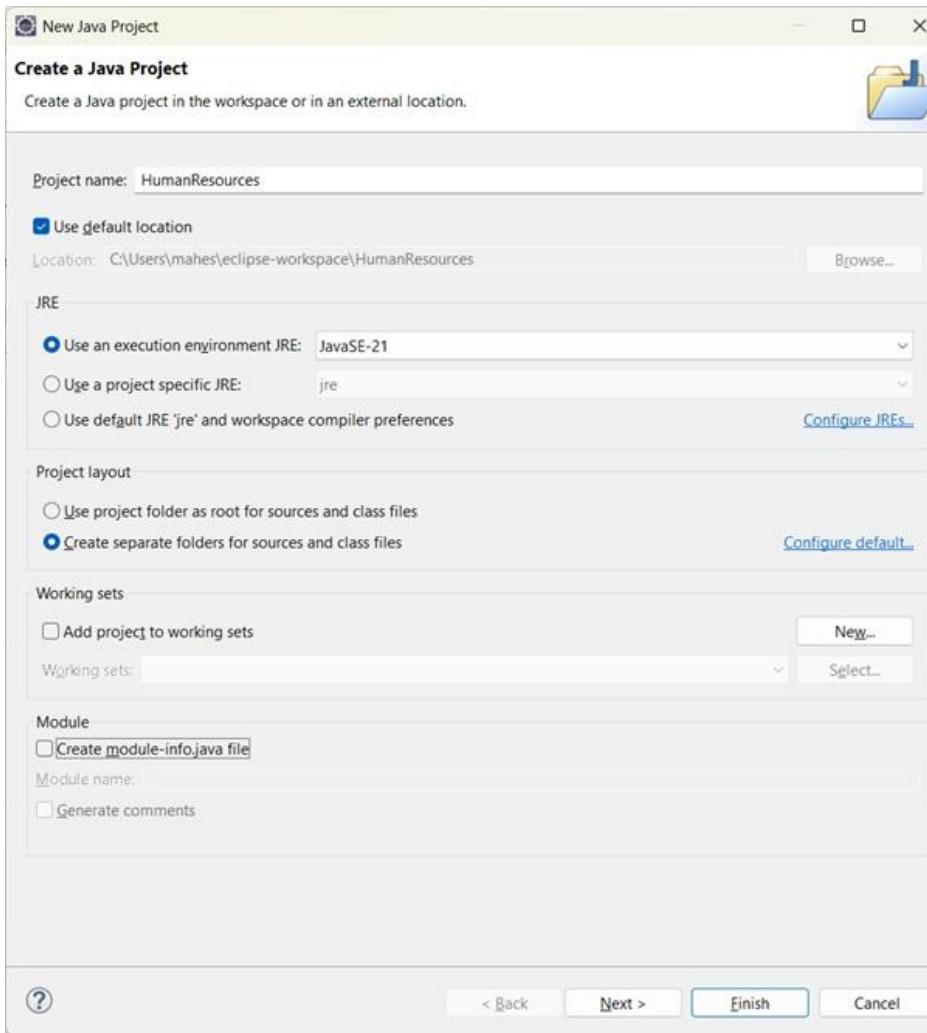


STEP 9: Create a new java project

- 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.



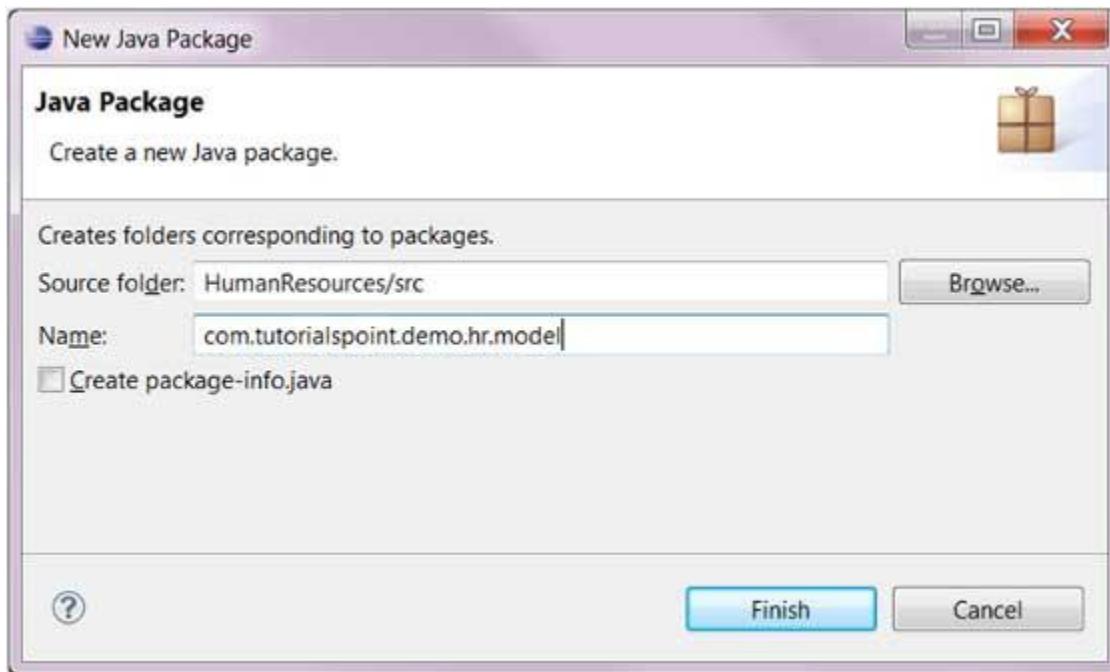
STEP 11: Create a new java package

- 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.

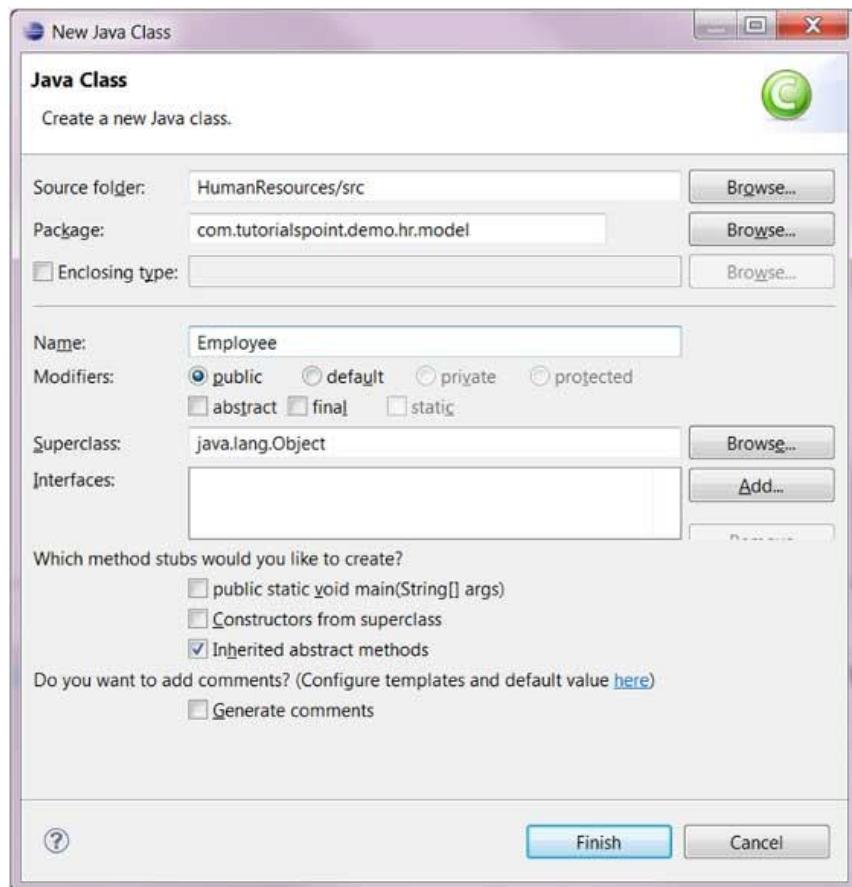


STEP 12: Create a New Java class.

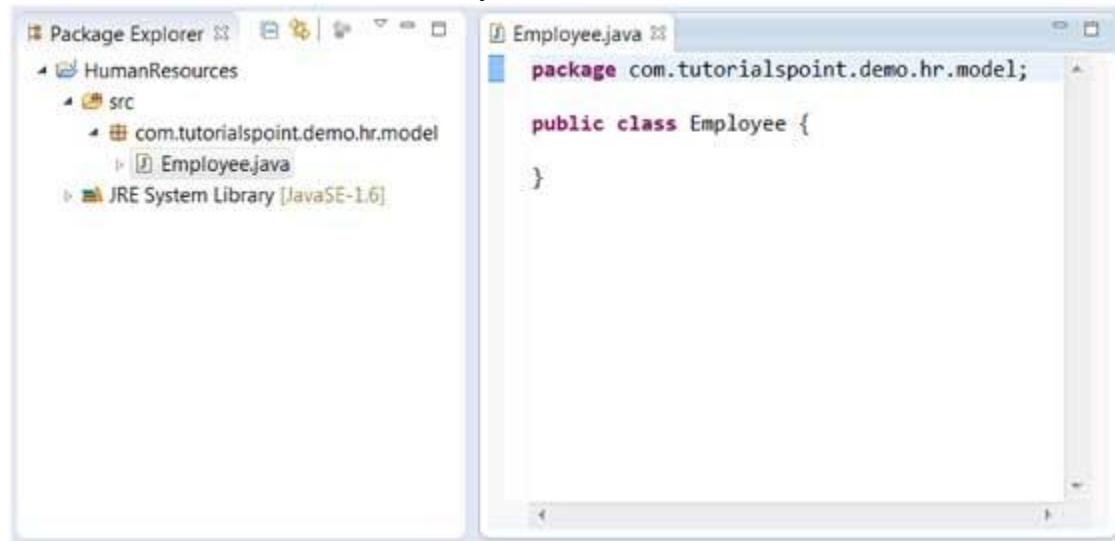
- By clicking on the File menu and selecting New → Class.
- By right clicking in the package explorer and selecting New → Class.
- By clicking on the class drop down button () and selecting class ().

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

```
<terminated> HelloWorld [Java App]  
Hello World
```

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: Anitha

Age: 20

```
<terminated> DisplayInfo [Java Application]  
Name: Anitha  
Age: 20
```

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

```
<terminated> DisplayInfo [Java Application] C:\Users\msand\p2\  
Sum = 30
```

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

```
<terminated> DisplayInfo [Java Application] C:\Users\  
Area = 50
```

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:

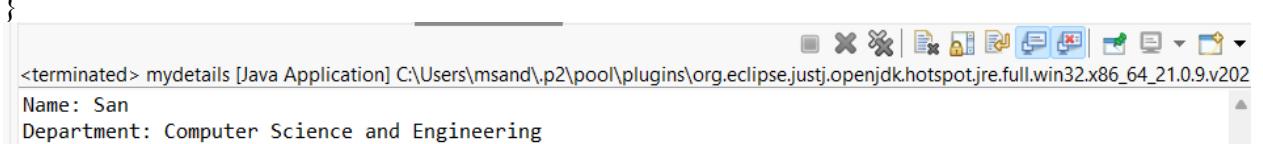
Simple Interest = 100

```
<terminated> DisplayInfo [Java Application] C:  
Simple Interest = 100
```

POST LAB EXERCISE

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

```
class MyDetails {  
    public static void main(String[] args) {  
        System.out.println("Name: San");  
        System.out.println("Department: Computer Science and Engineering");  
    }  
}
```



A screenshot of a Java application window titled "mydetails [Java Application] C:\Users\msand\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.9.v202". The window shows the output of the program: "Name: San" and "Department: Computer Science and Engineering".

2. Modify the program to print the output in same line.

```
class MyDetailsOneLine {  
    public static void main(String[] args) {  
        System.out.print("Name: San ");  
        System.out.print("Department: Computer Science and Engineering");  
    }  
}
```

```
}
```

```
<terminated> mydetails [Java Application] C:\Users\msand\p2\pool\plugins\org.eclipse.justj.  
Name: SanDepartment: Computer Science and Engineering
```

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

If `main()` is written **without static**, the program **will not run**.

Reason:

- JVM calls `main()` **without creating an object**
- Non-static methods require an object
- So JVM gives an **error**

Conclusion:

`static` is **mandatory** for `main()` method

4. Why is Java called platform independent?

Java is called **platform independent** because:

- Java programs are compiled into **bytecode**
- Bytecode can run on **any operating system**
- JVM converts bytecode into machine code

Rule:

Write once, run anywhere (WORA)

5. Write a program to find the cube of a number.

```
class CubeNumber {  
    public static void main(String[] args) {  
        int num = 3;  
        int cube = num * num * num;  
        System.out.println("Cube = " + cube);  
    }  
}
```

```
<terminated> CubeNumber [Java App]
```

```
Cube = 27
```

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		