**23CSE111**

**LAB MANUAL**



**Department of CSE**

**Amrita School of Engineering**

**Amrita Vishwa Vidyapeetham, Amaravati Campus**

**Verified By :- Name: B.Syam Sunder**

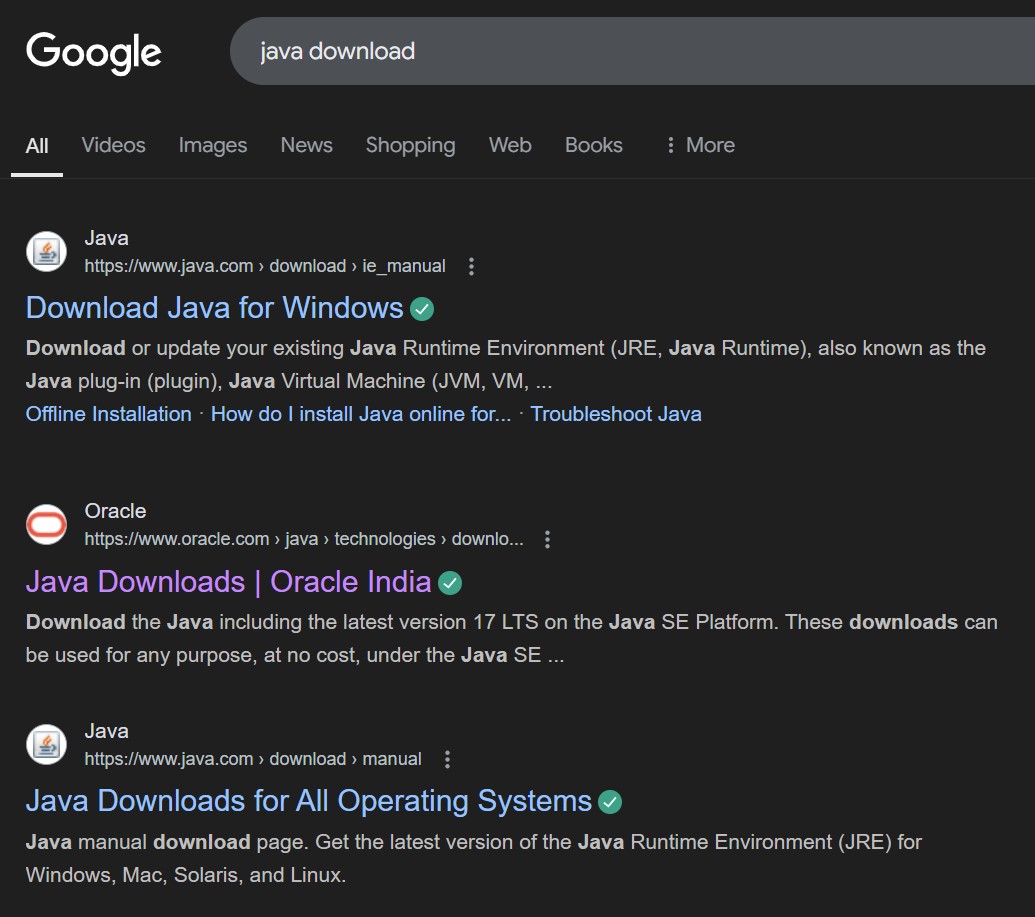
**Roll No: AV.SC.U4CSE24023**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.NO | Programs | Date | Pg:No | Signature |
| 1 | 1. Download and Install Java Software. 2. Write a java program to print message “Welcome to java programming”. 3. Write a java program that prints name,roll number,section of a student. |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
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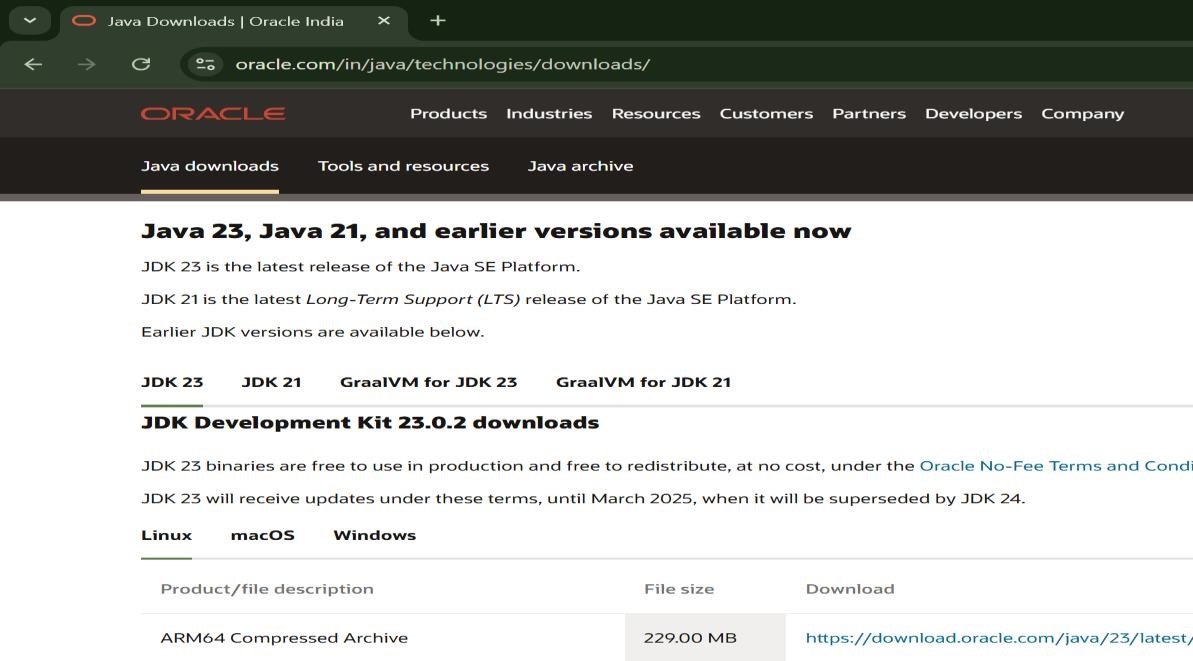
Week 1:-

# Program-1:-

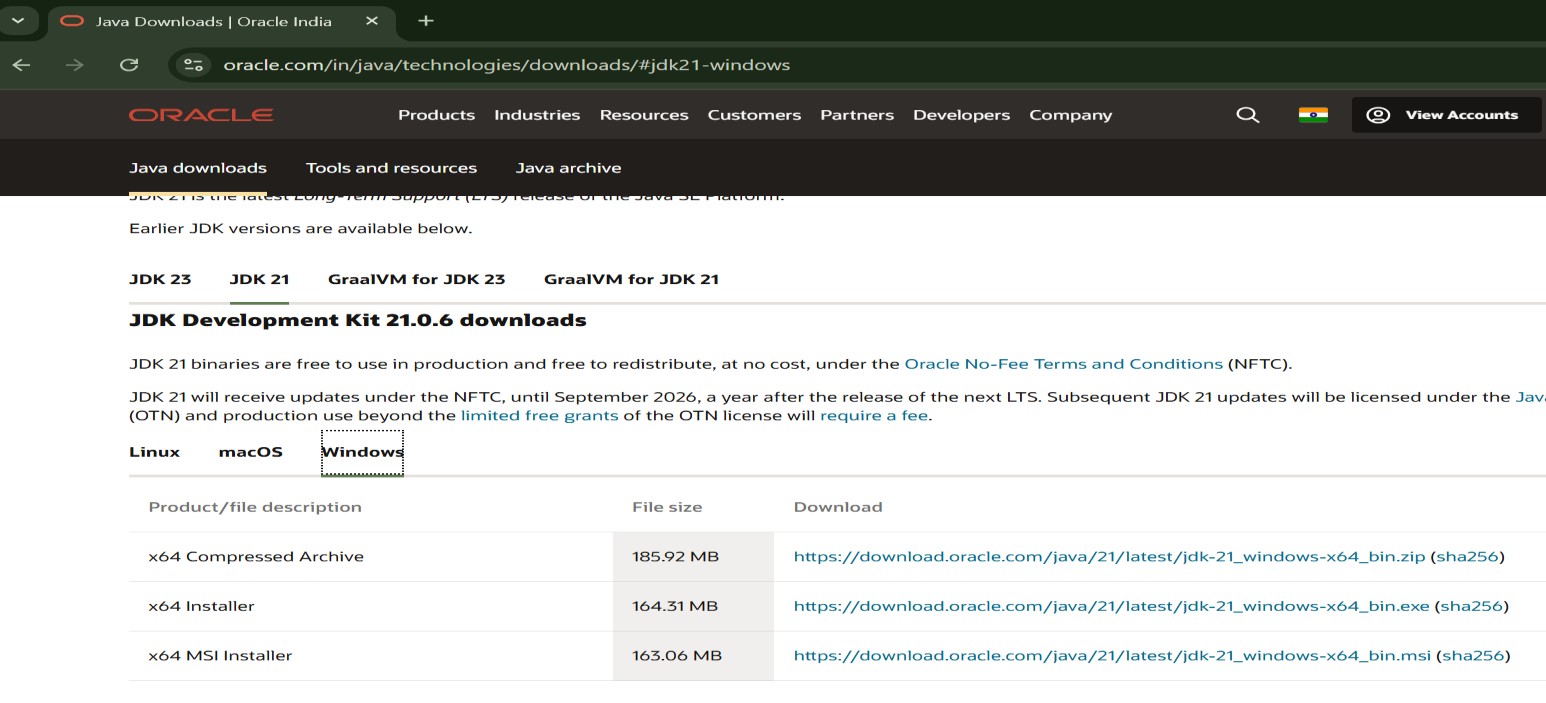
## Aim:-Download and Instal the Java Software Procedure Step-1:- Type Java download in search



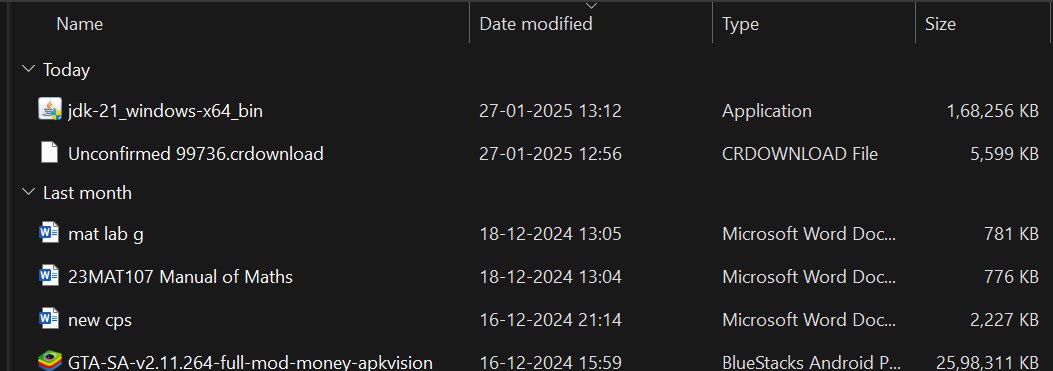
## Step-2:-click on oracle java download and enter into oracle website



## Step-3:-click on JDK21 and click on windows and later click on x64 instalier link to download

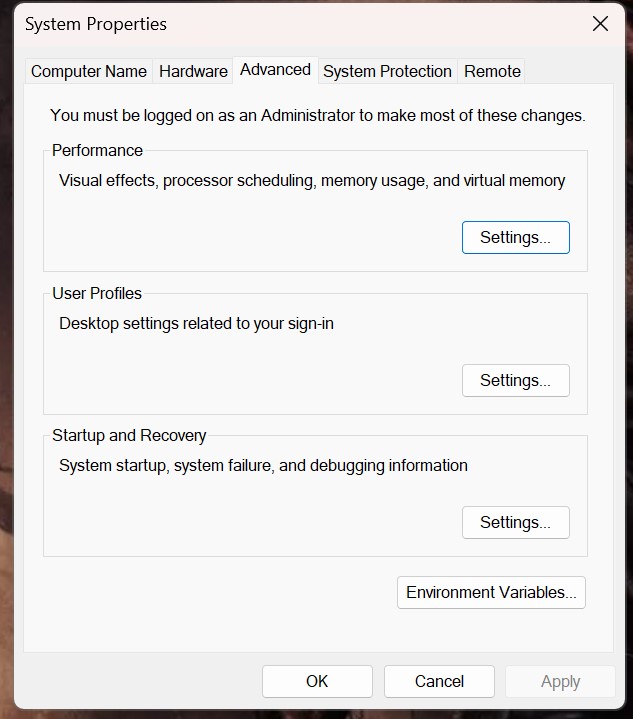


## Step-4:-After completing download click on it’s file and then give permission to install



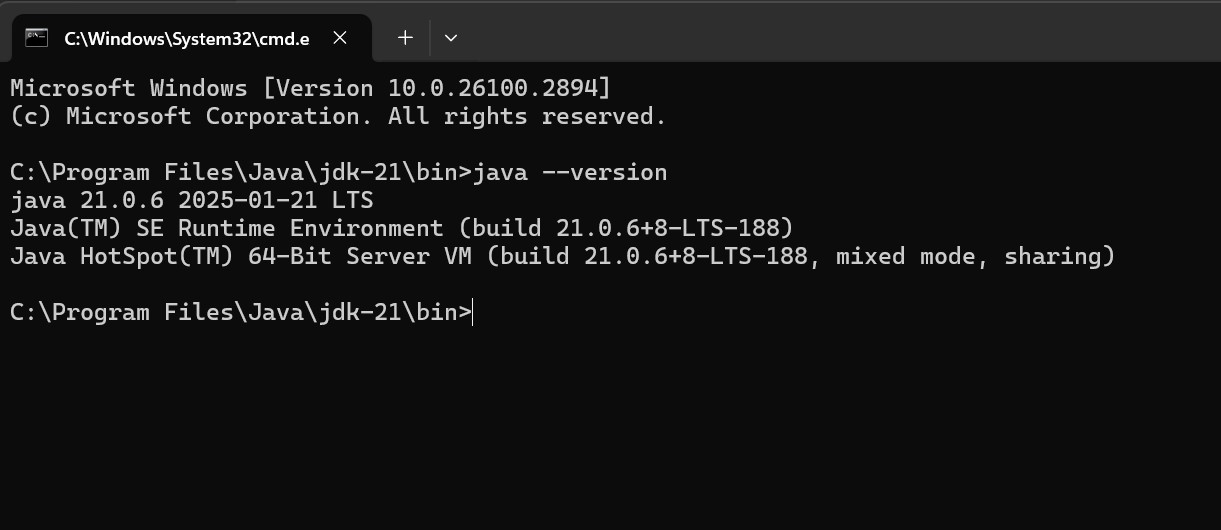
Step-5:-Then go to (This pc) in that click (windows{c}) in that click (Program files) in that click (Java) in that click (jdk-21) in that click (bin)

## Step-6:-Select and copy path of opening the file and then press windows and search System Environmental



Step-7:-After opening Environment variables then past path of opening file in user variable and click on ok

## Step-8:-To verify version open CMD and type java --version



**Program : 2**

## Aim:-write a java program to print[welcome to java programming Input:-

class ex\_1{

public static void main(String[] args){

System.out.println("welcome to java programming");

}

}

## Output:-



### Program : 3

Aim:-write a java program that prints name, roll no, section of the student Input:-

class ex\_2{

public static void main(String[] args){

System.out.println("Name: B.Syam Sunder");

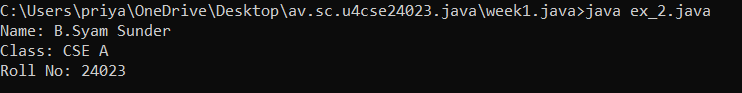
System.out.println("Class: CSE A");

System.out.println("Roll No: 24023");

}

}

### Output:-

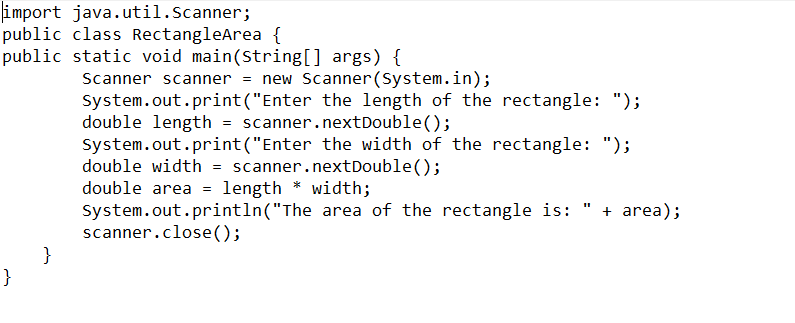


***Week-2***

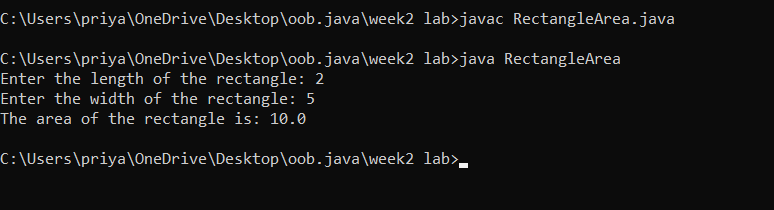
Program-1:

Aim: to write a java program to find area of rectangle

Input:



Output:



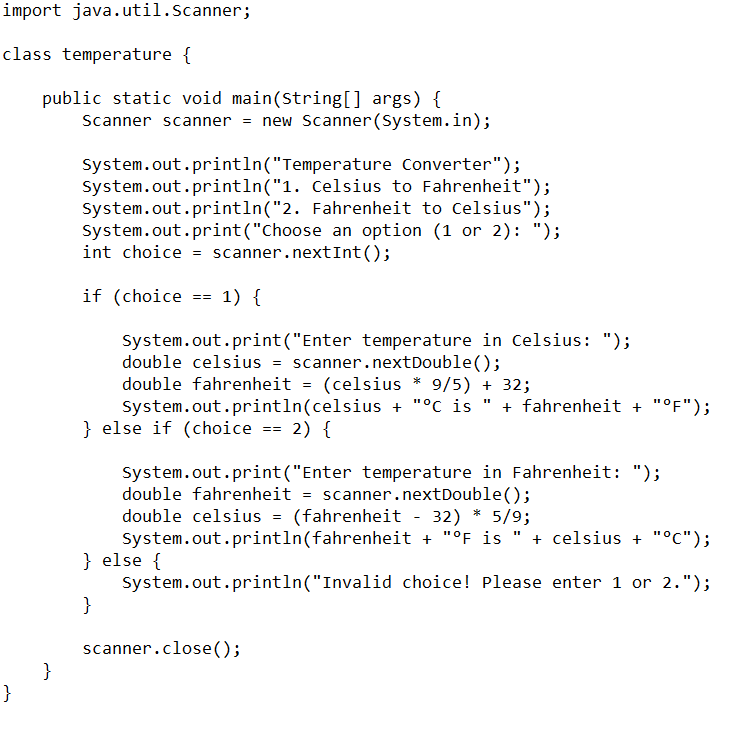
Errors:

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Description** | **Correction** |
| **Syntax Error** | Unclosed string literal(“ missing) | Ensure all strings are properly enclosed in double quotes (") |
| **Runtime Error** | Dividing by zero when calculating an aspect ratio | Check for zero before division (if (width != 0) { ... }) |

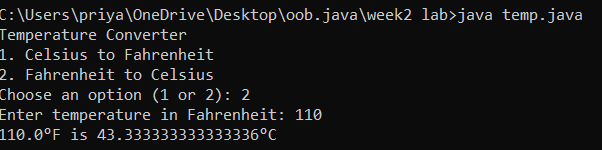
Program-2

2.write a java program to convert the temperature from celcius to farhienheat:

Program:



Output:



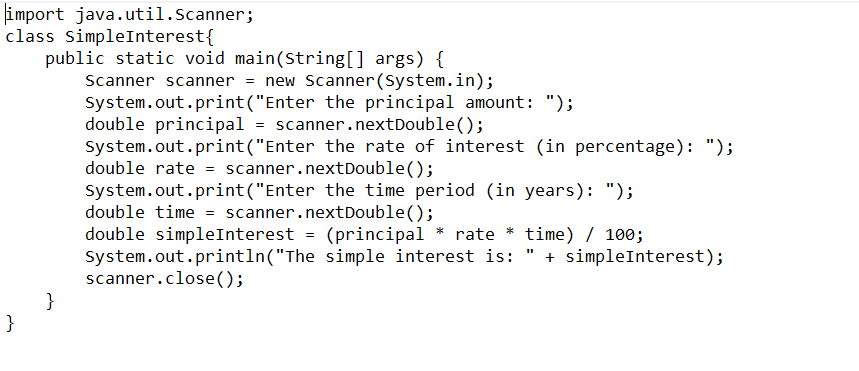
Error:

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Description** | **Correction** |
| **Syntax Error** | Forgot to write ; (semicolon) | Ensure every statement ends with a semicolon (;) |
| **Runtime Error** | Dividing by zero when calculating an aspect ratio | Check for zero before division (if (width != 0) { ... }) |
| **Variable Declaration Error** | Wrong variable declaration | Use correct data types and proper syntax |

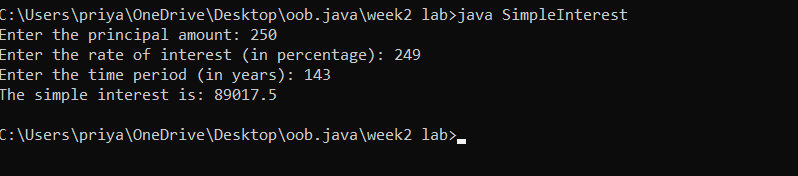
Program-3

3.write a java program to cacluate the simple intrest

Program:



Output:



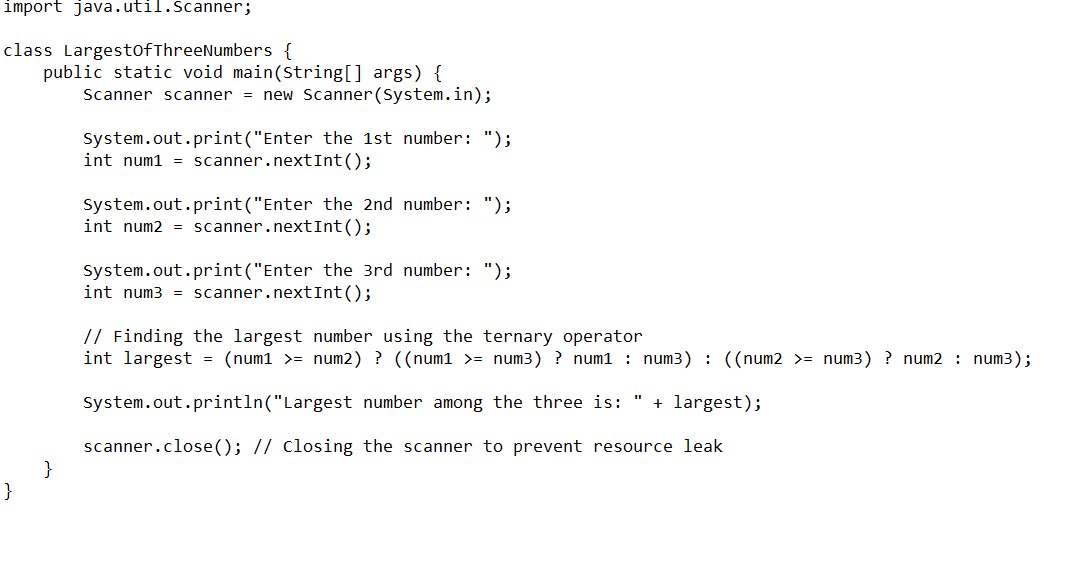
Error:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  | |  | |
|  | |  | |  | |
|  | |  | |  | |
| **Error Type** | **Description** | | **Correction** | |
| **Syntax Error** | Missing semicolon (;) after System.out.println() | | Add ; at the end of System.out.println() statements | |
| **Data Type Error** | int used instead of double for time (t) | | Change int t = read.nextInt(); to double t = read.nextDouble(); | |
| **Type Mismatch** | int r = read.nextDouble(); (assigning double to int) | | Change int r to double r for correct data type | |

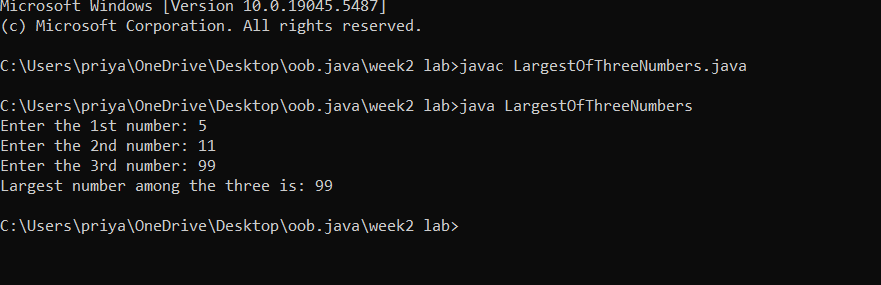
Program-4

Write a java program to find the largest of three numbers using terinary operator

Program:



Output:



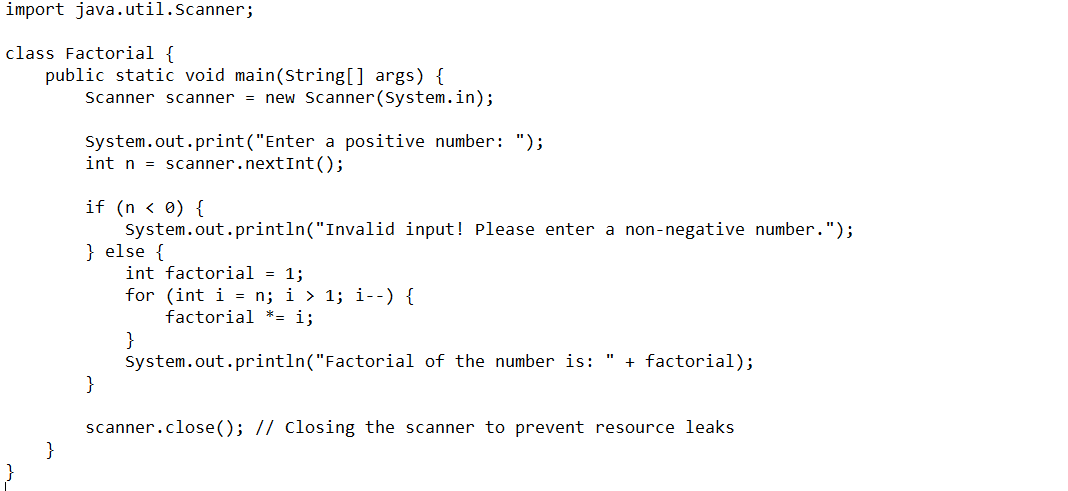
Error:

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Description** | **Correction** |
| **Syntax Error** | Missing space in output: "Largest Number of 3 numbers is" + largest | Change to "Largest Number of 3 numbers is " + largest (add space before largest) |
| **Logical Error** | No read.close(); to free resources | Add read.close(); at the end of the program |
| **Input Handling Issue** | No prompt for invalid input (e.g., non-integer values) | Add input validation using if (read.hasNextInt()) before reading values |

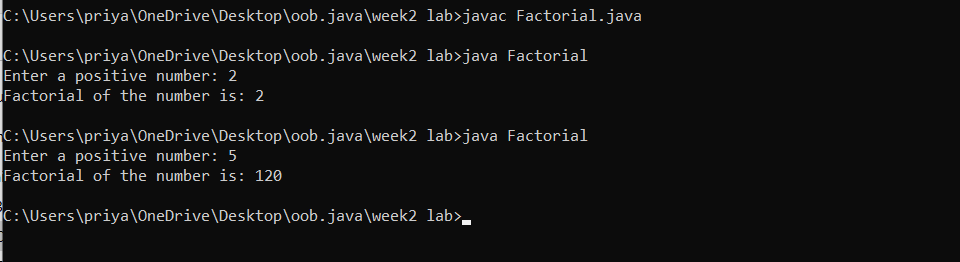
Program-5

5.Write a java program to find the factorial of a number

Program:



Output:



Error:

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Description** | **Correction** |
| **Syntax Error** | do keyword mistakenly placed before for loop | Remove do before for(int i=n; i>=1; i--) |
| **Logical Error** | if(n<0) check comes after the factorial calculation | Move if(n<0) check before the loop to prevent calculation |
| **Resource Leak** | Scanner not closed | Add read.close(); at the end of the program |

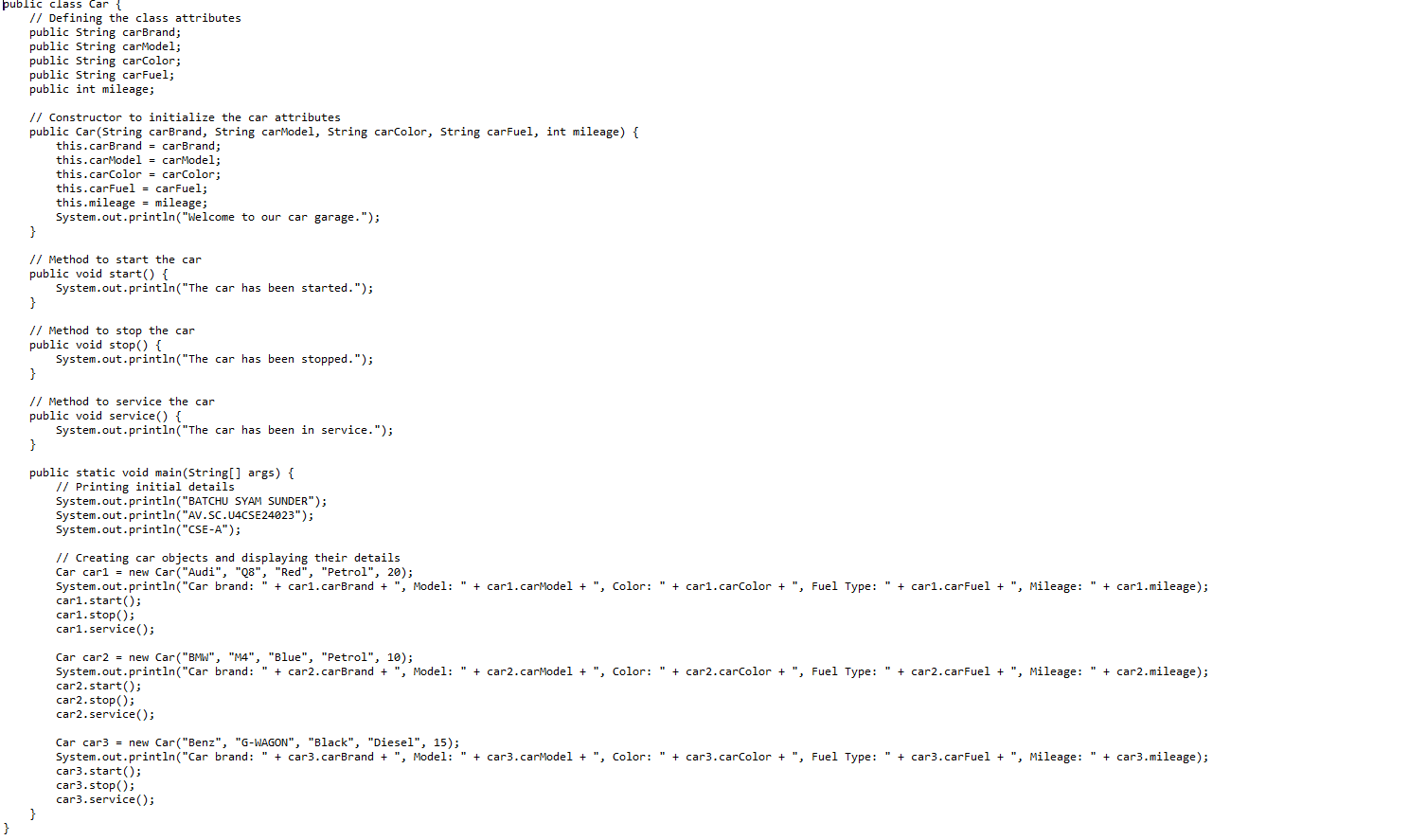
Week-3

1. Create the java program for the cars with constructor and methods

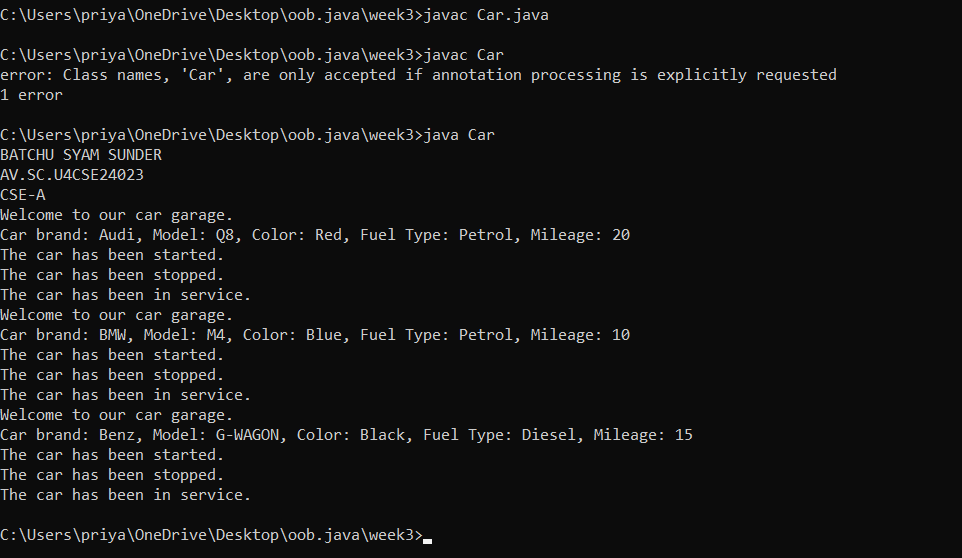
Class diagram:

|  |
| --- |
| **Car** |
| * carColor: String |
| * carBrand: String |
| * fuelType: String |
| * topSpeed: int |
| + Car(String,String,String,int) |
| + startRacing() |
| + endRace() |

Program:



Output:



**Error:**

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Incorrect Code** | **Corrected Code** |
| **Class Naming Issue** | **class main{** | **class Main{** |
| **Incorrect Object Description** | **"Our first car is "+car2.car\_brand;** | **"Our second car is "+car2.car\_brand;** |

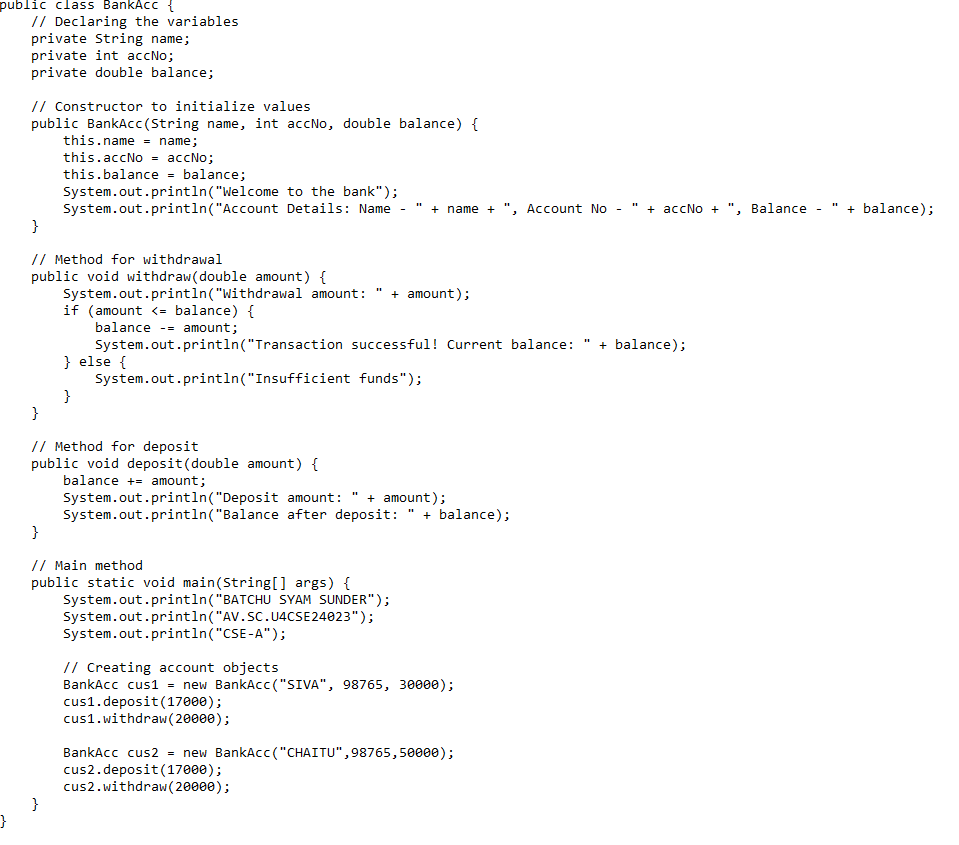
Program-2

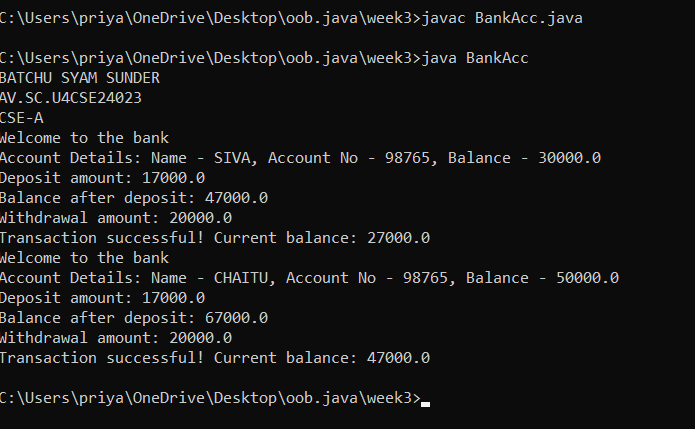
1. Create the java program to withdraw and deposit money in the bank account.

Program:

Class diagram:

|  |
| --- |
| Bank Account |
| * currentAmount: double |
| + BankAccount(initialAmount:double) |
| +deposit(amount: double):void |
| +withdraw(amount: double):void |
| +getCurrentAmount():double |

Program: 

Output: 

**Error:**

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Incorrect Code** | **Corrected code** |
| **Class Name Capitalization** | class Bankaccunt | class BankAccount (Java follows PascalCase for class names) |
| **Object Naming Issue** | BankAccount person-1 (hyphen is not allowed) | BankAccount person1 |
| **Missing Semicolon** | System.out.println ("Balance is "+ person-1.deposit (50,000)) | System.out.println ("Balance is "+ person1.deposit (50000)); (semicolon added) |

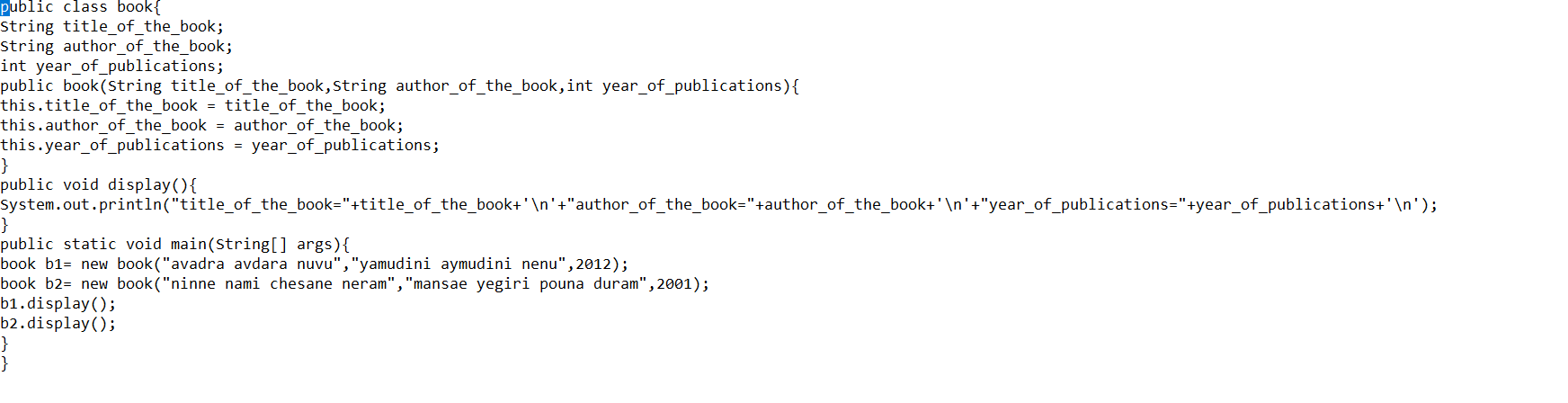
Week-4

1. Create the java program for the books by using the constructor and display its details using methods.

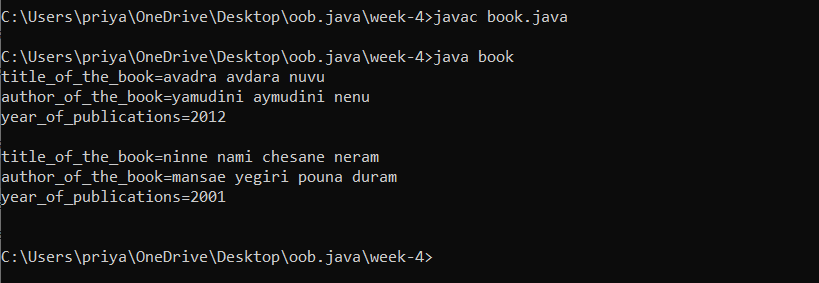
Program

Class diagram:

|  |
| --- |
| **Book** |
| - title: String  - author: String  - yearOfPublication: int |
| + Book(title: String, author: String, yearOfPublication: int)  + displayDetails(): void |



Output:



**Errors:**

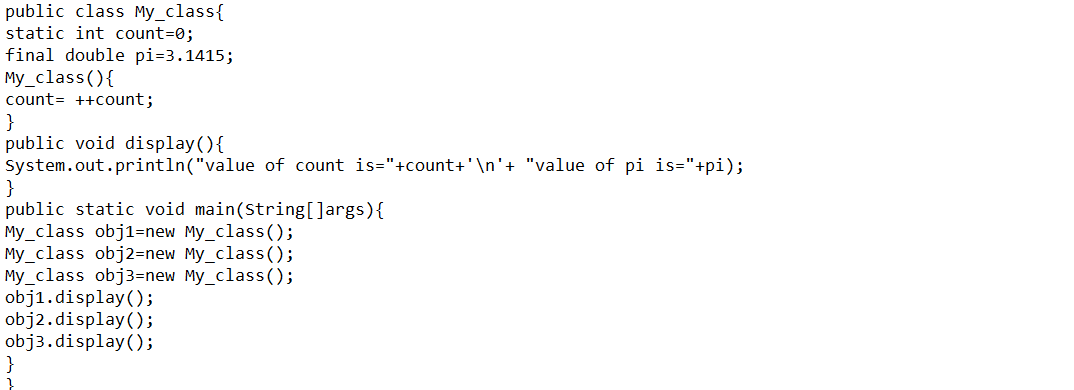
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Error Type** | |  | | --- | | **Incorrect Code** |  |  | | --- | |  | | **Corrected Code** |
| **Class Name Capitalization** | public class book | public class Book (Java follows PascalCase for class names) |
| **Constructor Name Mismatch** | new book(...) | new Book(...) (Constructor name must match class name) |
|  |  |  |
|  |  |  |

1. Program to explain the final and the static variables.

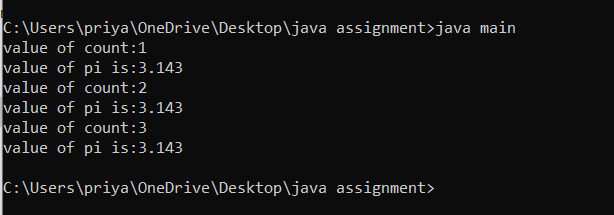
Program:

Class diagram:

|  |
| --- |
| **MyClass** |
| - Count: int  + pi: double |
| + MyClass()  + getCount(): int |



Output:



**Error:**

|  |  |  |
| --- | --- | --- |
| **Error Type** | **Incorrect Code** | **Corrected Code** |
| **Attempt to Modify final Variable** | pi = 3.14; (if added inside the constructor or method) | Remove this line (final variables cannot be reassigned) |
| **Incorrect Class Name** | public class Myclass | public class MyClass (Java follows PascalCase for class names) |

**Week-5**

**Program 1:**

**Aim: Create a calculator using the operations including addition using subtraction, multiplication and division using multilateral inheritance and display the desired output.**

**Class diagram:**

**CLASS DIAGRAM:-**

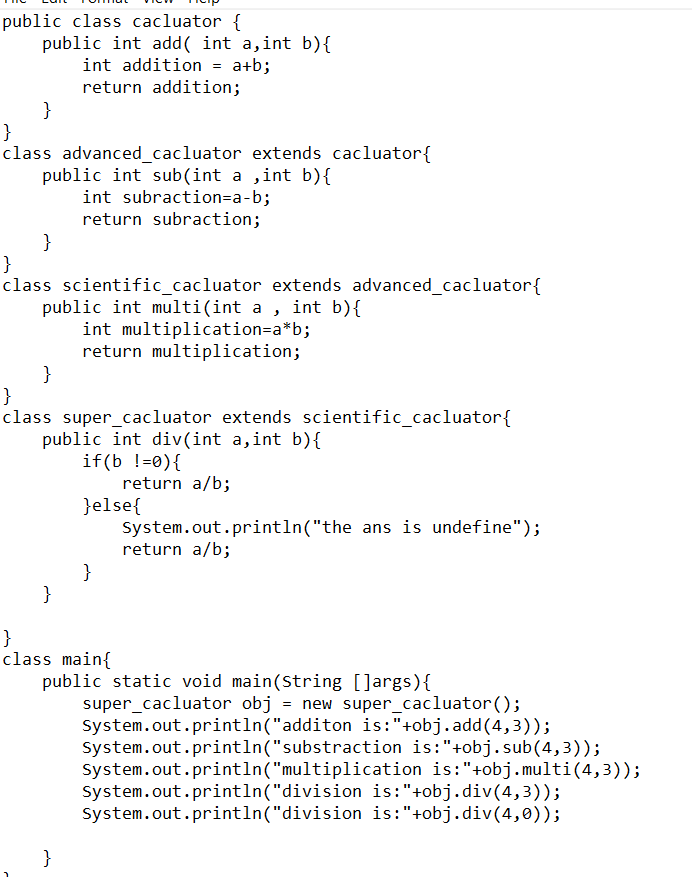
|  |
| --- |
| **CLASS ADDITION** |
| **+add(int a, int b):int** |

|  |
| --- |
| **Class Subtraction** |
| **+sub(int a, int b):int** |

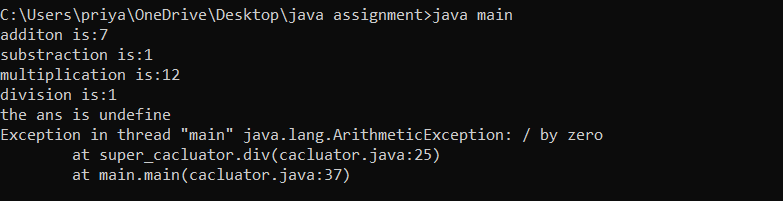
|  |
| --- |
| **Class Multiplication** |
| **+mult(int a, int b):int** |

|  |
| --- |
| **Class Division** |
| **+div(int a, int b):int** |

**Error table:**



Output:



**Error table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Error Type** | **Reason for error** | **Rectification** |
| **1.** | Constructive error | Invalid method name declared | Created class name |
| **2.** | Syntax error | Haven’t included ‘;’ | Added ‘;’ |
|  |  |  |  |

**Program-2:**

**Aim:**

A vehicle rental company wants to develop a system that maintains

Information about different types of vehicles available for rent

The Company rents out cars, bikes and truck and they need a program to

Store details about each vehicle, such as brand and speed

Cars should have an additional property: number of doors

Bikes should have a property indicating whether they have gears or not

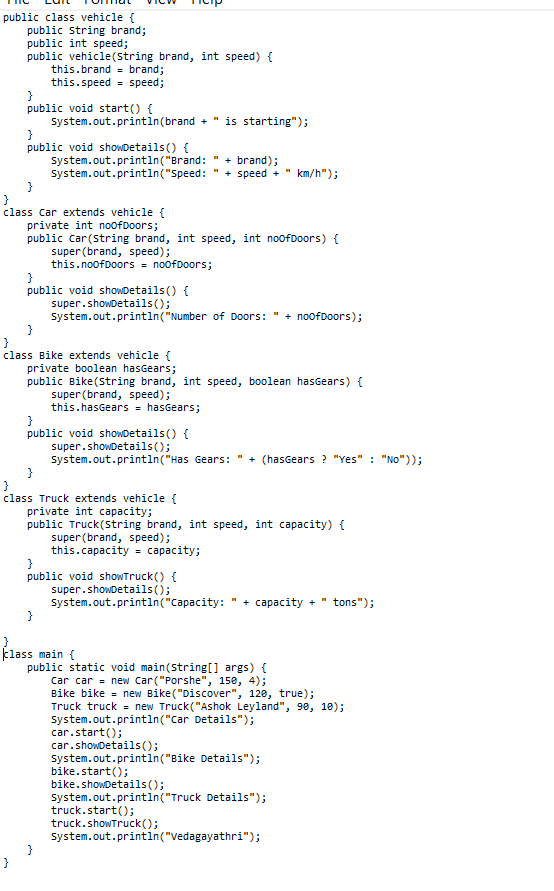
The system should also include a function to display details about each vehicle

And indicate when a vehicle is starting.

**Program:**

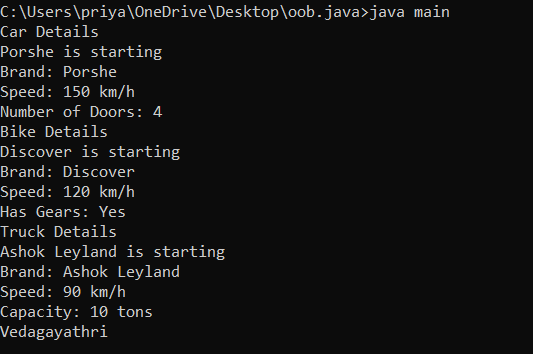
**Class diagram:**



****

\

**Output**:



Error table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S No | ErrorType | Cause | Rectification |  |
| 1 | SyntaxError | Semicolon missing | Added ; |  |
|  |  |  |  |  |

***WEEK-6 PROGRAMS JAVA***

***Program 1:***

**1)Write a java program to create a vechicles class with a method displayinfo()override the method in the car subclass to provide specific information about a car**

**Company**

**Model**

**Price**

**Seating capacity**

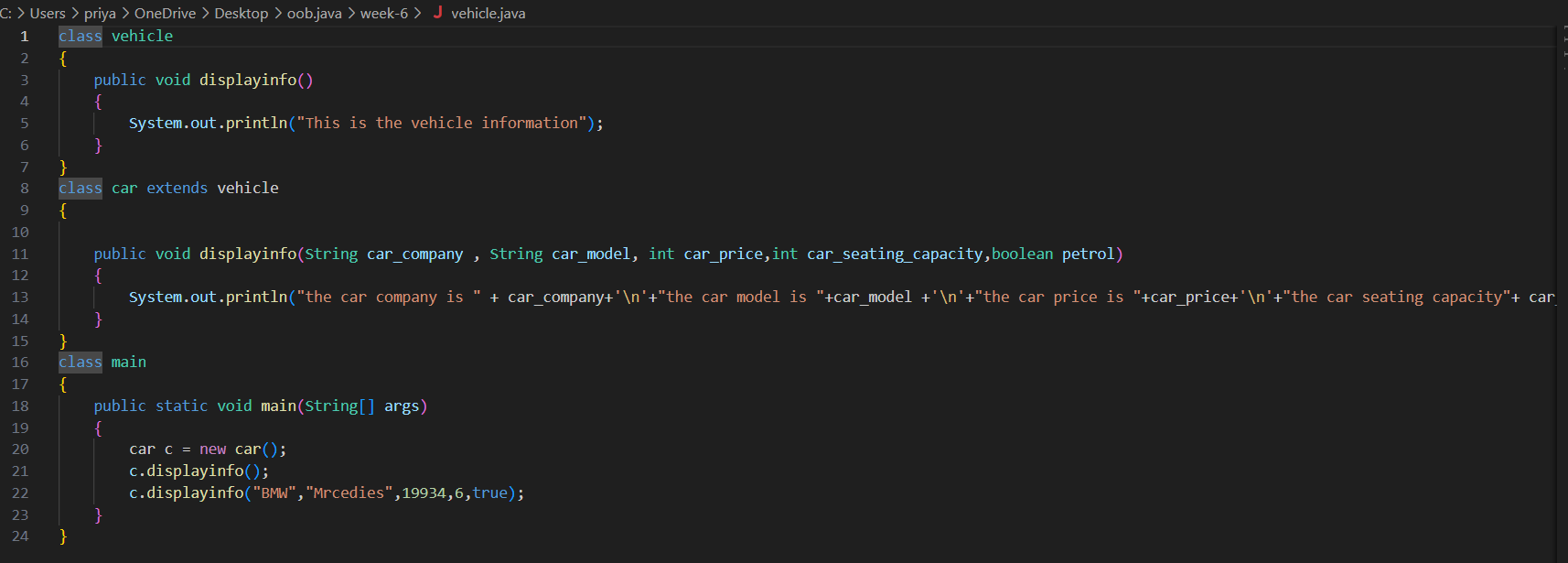
**Petrol or not**

**Program:**

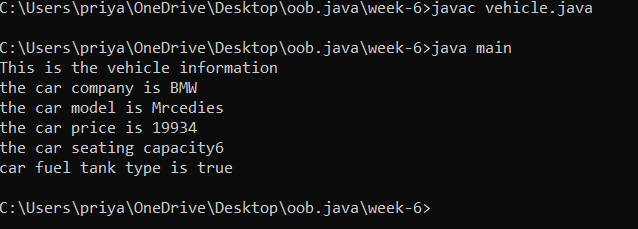
**Class Diagram:**

|  |
| --- |
| **Vehicle** |
| **+displayInfo(): void** |

|  |
| --- |
| **car** |
| **+displayInfo(): void** |

****

**Output:**

****

**Error table:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **ExpectedError** | **Reason** |
| **1** | **Setting the parameters inside the constructor** | **We cannot pass the values inside constructor without setting them first** |
| **2** | **}** | **Ending the class and main method is required** |
|  |  |  |

**2Q)A college is developing automated admission system that verifies students eligibility for UG and PG programs .Each program has different eligibility criteria based on the students percentage in their previous qualification.**

**1) UG admission require minimum 60%**

**2)PG admission require minimum 70%**

**Program:**

**Class diagram**

|  |
| --- |
| **adm** |
| **elg():void** |

|  |  |
| --- | --- |
| **ug** | **pg** |
| **+elg():void** | **+elg():void** |
|  |  |

**Program:**

**import java.util.Scanner;**

**class College {**

**String name;**

**int qualification;**

**int percentage;**

**// Constructor**

**College(String name, int qualification, int percentage) {**

**this.name = name;**

**this.qualification = qualification;**

**this.percentage = percentage;**

**}**

**// Default Eligibility method**

**public void Eligibility() {**

**System.out.println("Name: " + name + ", Qualification: " + qualification + ", Percentage: " + percentage);**

**System.out.println("The candidate is a fluke");**

**}**

**}**

**class UG extends College {**

**UG(String name, int qualification, int percentage) {**

**super(name, qualification, percentage);**

**}**

**@Override**

**public void Eligibility() {**

**System.out.println("Name: " + name + ", Qualification: " + qualification + ", Percentage: " + percentage);**

**System.out.println("The candidate is eligible for UG");**

**}**

**}**

**class PG extends College {**

**PG(String name, int qualification, int percentage) {**

**super(name, qualification, percentage);**

**}**

**@Override**

**public void Eligibility() {**

**System.out.println("Name: " + name + ", Qualification: " + qualification + ", Percentage: " + percentage);**

**System.out.println("The candidate is eligible for PG");**

**}**

**}**

**public class Main {**

**public static void main(String[] args) {**

**Scanner input = new Scanner(System.in);**

**// Taking inputs**

**System.out.println("Enter your name:");**

**String name = input.nextLine();**

**System.out.println("Enter your qualification (e.g., 12 for high school, 10 for 10th, etc.):");**

**int qualification = input.nextInt();**

**System.out.println("Enter your percentage:");**

**int percentage = input.nextInt();**

**// Close scanner**

**input.close();**

**// Logic to check eligibility**

**College candidate;**

**if (percentage >= 70) {**

**candidate = new PG(name, qualification, percentage);**

**} else if (percentage >= 60) {**

**candidate = new UG(name, qualification, percentage);**

**} else {**

**candidate = new College(name, qualification, percentage);**

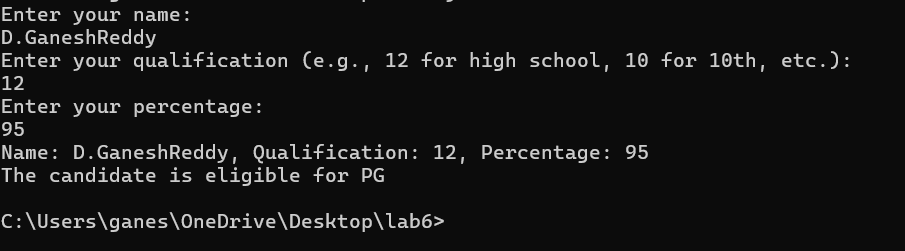
**}**

**candidate.Eligibility();``**

**}**

**}**

**Output:**



**Error table:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **ExpectedError** | **Reason** |
| **1** | **Setting the parameters inside the constructor** | **We cannot pass the values inside constructor without setting them first** |
| **2** | **}** | **Ending the class and main method is required** |

**3Q)Create a calculator class with overloading methods to perform addition**

**1)Add two doubles**

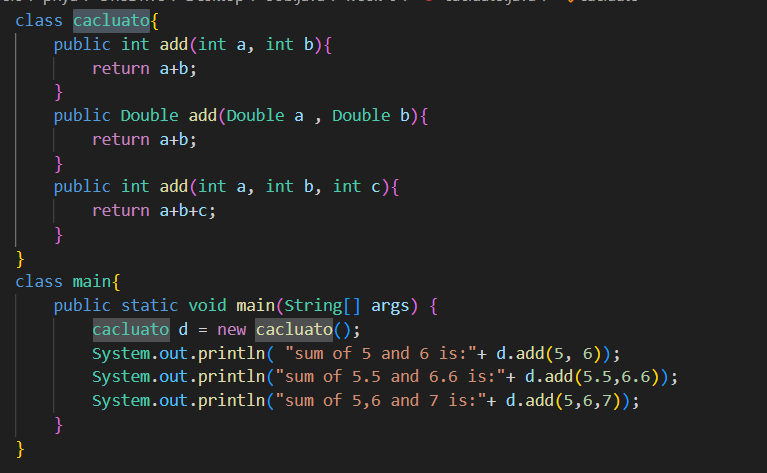
**2)Add two integer**

**3)Add three integer**

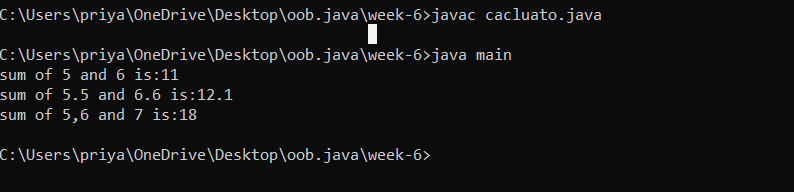
**Program:**

**Class diagram:**

|  |
| --- |
| **cacluato** |
| **+add(int a,int b):int**  **+add(double a,double b):double**  **+add(int a,int b,int c):int** |

****

**Output:**

****

**Error table:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Expected Error** | **Reason** |
| **1** | **Setting the parameters inside theconstructor** | **We cannot pass the valuesinside constructor without setting them first** |
| **2** | **}** | **Ending the class and main method is required** |

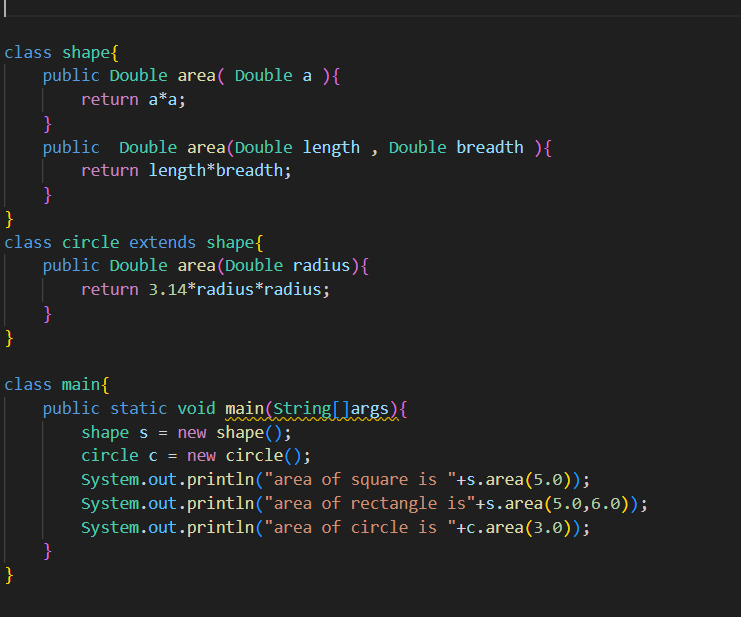
**4Q)Create a shape class with a method calculate area that is overloaded for different shapes Square,Rectangle then create a sub class circle that overerides the calculate area methods for a circle.**

**Program:**

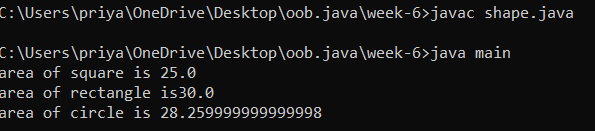
**Classdiagram:**

|  |
| --- |
| **shape** |
| **+calarea(float side):float**  **+calarea(float l,float b):float**  **+calarea(float c):float** |

|  |
| --- |
| **Circle** |
| **+calarea(double r):double** |

****

**Output:**

****

**Error table:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Expected Error** | **Reason** |
| **1** | **Setting the parameters inside the constructor** | **We cannot pass the valuesinside constructor without setting them first** |
| **2** | **}** | **Ending the class and main method is required** |