Lab Title: Introduction to Java Programs:

Lab Number: One '1'

1.1. Objective

- To display Hello World in a simple Java Program.
- To built simple functions classes and their objects in Java Program.
- Take two number as input from keyboard and display their sum as result.

1.2. Materials Used

- Text Editor
  - Visual Studio Code

1.3. Theory

- 1.3.1. General Syntax of Java Program

```
access-specifier class class-name {
    //fields
    fieldtype fieldname;
    //methods
    public returnType methodName(){
        //Statement
    }
}
```

fields include differnet types of data members and methods include differnt functions which are implemented in our Java Program

- 1.3.2. Class:

```
  - A class acts as a blueprint, defining the structure and  behavior of
object.
  - It encapsulates data (attributes) and methods (functions) that operate
on that data.
  - Example:
      class MyClass {
          // Fields and methods are defined here
      }
```

- 1.3.2. Methods:

```
  - Methods within a class represent actions or behaviors that objects of
that class can perform.
  - They can have parameters (inputs) and may return values.
  - Example:
      void printHelloWorld() {
          System.out.println("Hello, World!");
      }
```

- 1.3.3.Objects:

```
  - An object is an instance of a class, embodying a specific entity with
defined attributes and behaviors.
  - Objects have a state (attributes) and behavior (methods).
  - Example:
        MyClass myObject = new MyClass();
```

- 1.3.4. Main Method and Program Execution:

```
  - The main method serves as the starting point for program execution.
  - It is where the program begins its execution.
  - Example:
      public static void main(String[] args) {
          // Program execution starts here
          MyClass myObject = new MyClass();
          myObject.printHelloWorld();
      }
```

1.4. Programs:

1.4.1. Program1:

```
_//FileName : HelloWorld.java_

public class HelloWorld { // creation of class HelloWOrld
        void display() {// Display function which display Hello World!
        System.out.println("Hello World!");
    }
    public static void main(String[] args) {
        HelloWorld world = new HelloWorld(); // object creation and default
constructor called
        world.display();//called display function
        return;
```

```
    }
};
```

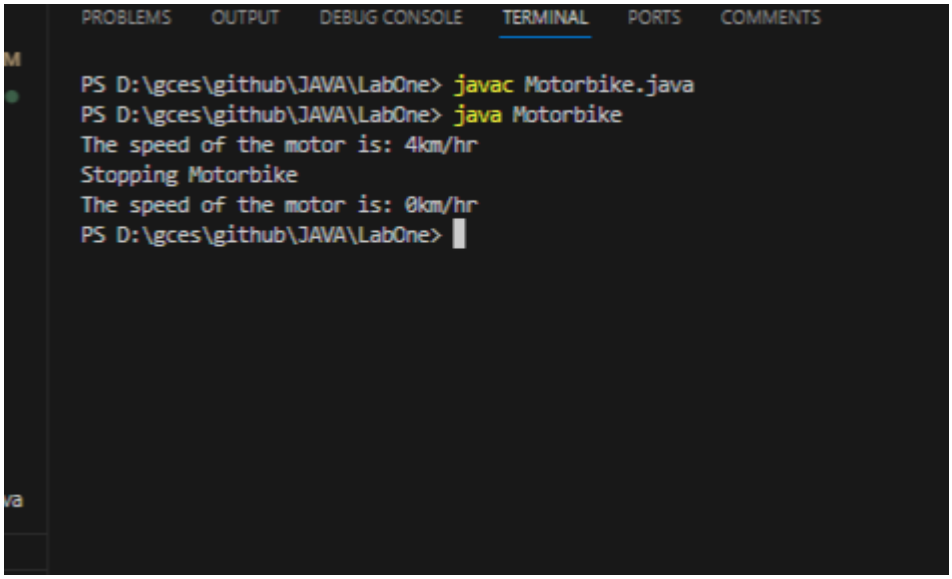
- *Output*

1.4.2. Program2:

```
_//FileName: Motorbike.java_

public class Motorbike {// craetion of class Motorbike
    int speed;// Data memebers
    String model;
    public Motorbike(String model){ // methods
        this.model = model;
    }
    public void accelerte(){//method to increment speed by 1
        this.speed += 1;
    }
    public void brake(){//method to decrement speed by 1
        this.speed -= 1;
    }
    public void stop() {// method that makes speed = 0
        this.speed = 0;
    }
    public int returnSpeed(){//method that return speed of motorbike
        return (this.speed);
    }
    public static void main(String[] args) {
        Motorbike motor = new Motorbike("Honda");//default constructor called with
String value 'Honda' which is assign to model
        motor.accelerte();//accelerate fn called speed =1
        motor.brake();//brake fn called which decrease the speed, speed = 0
        motor.accelerte();//speed =1
        motor.accelerte();//speed = 2
        motor.accelerte();//speed = 3
        motor.accelerte();//speed = 4
        System.out.println("The speed of the motor is: "+ motor.returnSpeed()+
```

```
"km/hr");//print speed = 4
        System.out.println("Stopping Motorbike");
        motor.stop();//making speed = 0
        System.out.println("The speed of the motor is: "+ motor.returnSpeed()+
"km/hr");//display speed = 0
        return;
    }
}
```

- *Output*

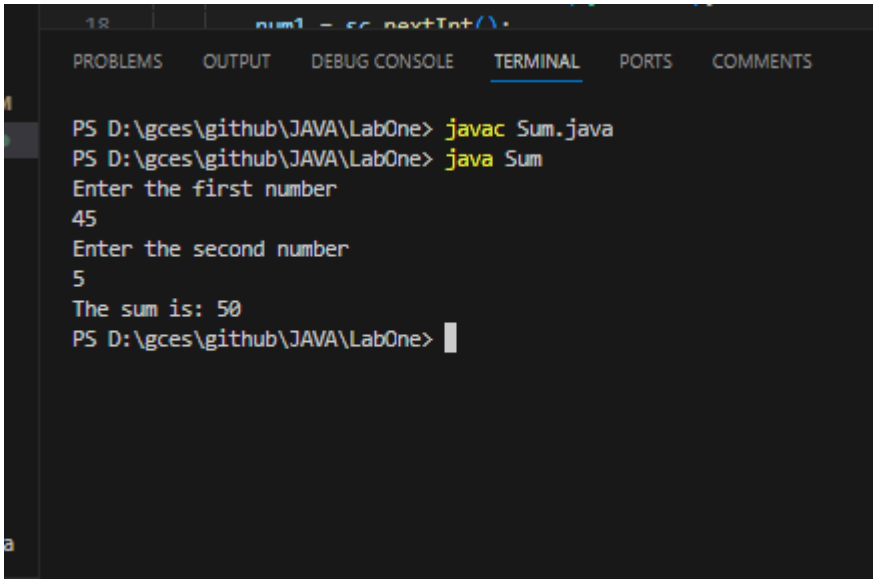


1.4.3. Program 3:

```
_//FileName: Sum.java_

import java.util.Scanner;//library fn which helps us to take input
public class Sum {
    private int num1;//private data member which is accessable inside the class
    only
    private int num2;
    public Sum(int num1, int num2) {//constructor which is used to initialize
    values in num1 and num2
        this.num1 = num1;
        this.num2 = num2;
    }

    int returnSum(){//method which returns the sum of num1 and num2
        return(num1+num2);
    }
    public static void main(String[] args) {
        int num1, num2;
        System.out.println("Enter the first number");
        Scanner sc = new Scanner(System.in);
```

```
        num1 = sc.nextInt();//taking a integer value as input which is entered by
user
        System.out.println("Enter the second number");
        num2 = sc.nextInt();//taking a integer value as input which is entered by
user
        Sum sum = new Sum(num1, num2);//creating object and calling parameterized
constructor
        System.out.println("The sum is: "+sum.returnSum());//displaying the sum of
both numbers
        sc.close();
    }
}
```

- *Output*

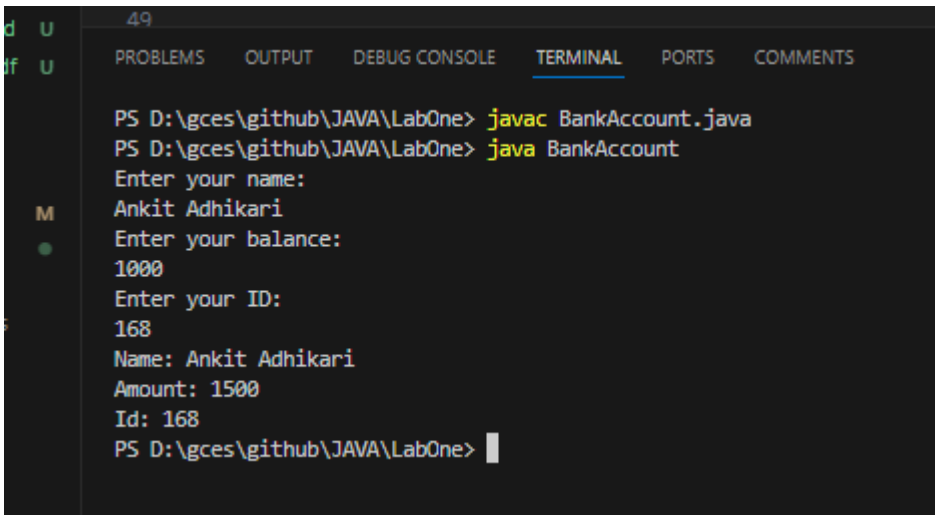


1.4.4. Program 4

```
//filename: BankAccount.java

import java.util.Scanner;
public class BankAccount {
    int balance;
    int id;
    String name;

    BankAccount(int balance, String name, int id) {
        this.balance = balance;
        this.name = name;
        this.id = id;
    }

    void readAccount() {
        Scanner scanner = new Scanner(System.in);
```

```
        System.out.println("Enter your name: ");
        name = scanner.nextLine();
        System.out.println("Enter your balance: ");
        balance = scanner.nextInt();
        System.out.println("Enter your ID: ");
        id = scanner.nextInt();
        scanner.close();
    }

    void depositBalance(int amount) {
        balance += amount;
    }

    void withdrawBalance(int amount) {
        balance -= amount;
        if (balance < 0) {
            System.out.println("Cannot withdraw");
            return;
        }
    }

    String getAccountDetails() {
        return ("Name: " + name + " Amount: " + balance + "Id: " + id);
    }

    public static void main(String[] args) {
        BankAccount ob = new BankAccount(100, "Ram", 1);
        ob.readAccount();
        // ob.getAccountDetails();
        ob.depositBalance(1000);
        ob.withdrawBalance(500);
        System.out.println(ob.getAccountDetails());
    }
}
```

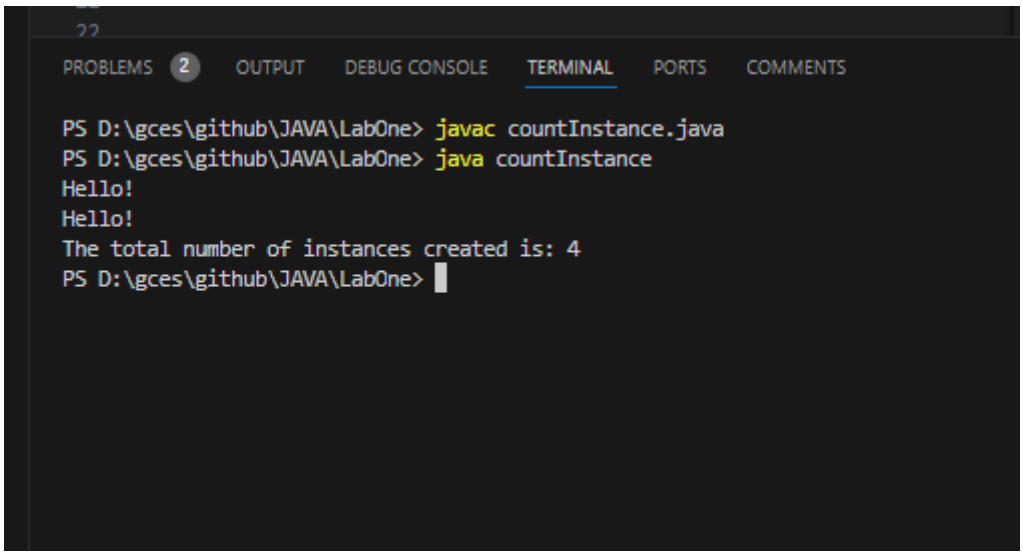
- *Output:*



1.4.5. Program 5

```
//filename: countInstance.java

public class countInstance {
    private static int count;
    public countInstance() {
        count++;
    }
    public void sayHello() {
        System.out.println("Hello!");
    }
    public int returnCount() {
        return count;
    }

    public static void main(String[] args) {
        countInstance ob1 = new countInstance();
        countInstance ob2 = new countInstance();
        countInstance ob3 = new countInstance();
        countInstance ob4 = new countInstance();
        ob1.sayHello();
        ob2.sayHello();
        System.out.println("The total number of instances created is: " +
ob1.returnCount() );
    }
}
```

- *Output*



Conclusion:

- After this lab, Now I can write, compile, and run Java programs. I've learned how to create classes, objects, and use fields, methods, and constructors. Additionally, I can read input from the command

line.