LabSession

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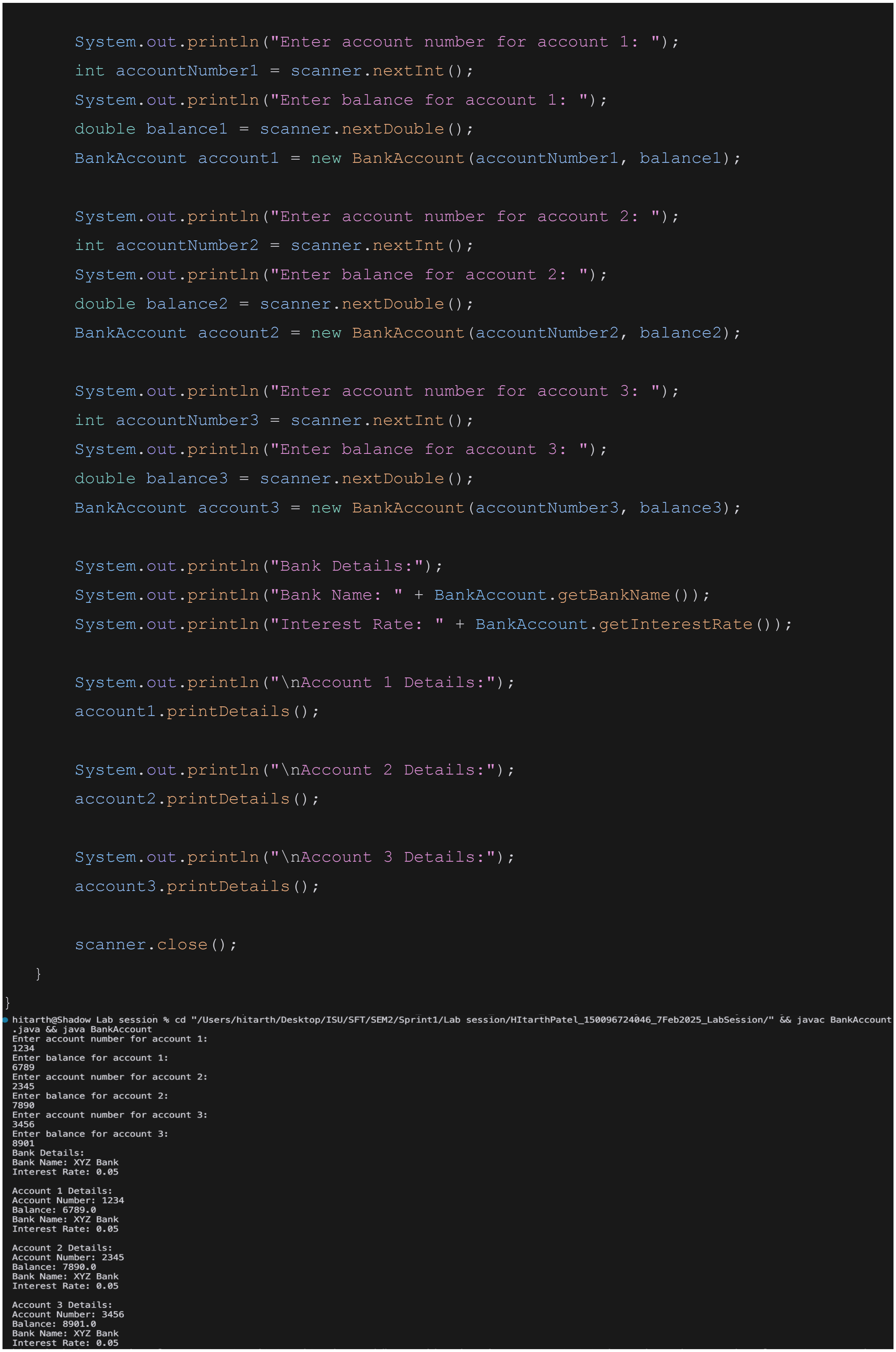
1.Write a Java program to create a class called "BankAccount" with instance variables 'accountNumber' and balance, and static variables 'bankName' and 'interestRate'. Provide static methods to get and set the static variables. Create several 'BankAccount' objects and print their details along with the static variables.

→

```
import java.util.Scanner;

public class BankAccount {
   private int accountNumber;
   private double balance;
   private static String bankName = "XYZ Bank";
   private static double interestRate = 0.05;

   public BankAccount(int accountNumber, double balance) {
       this.accountNumber = accountNumber;
       this.balance = balance;
   }

   public static String getBankName() {
       return bankName;
   }

   public static double getInterestRate() {
       return interestRate;
   }

   public void printDetails() {
       System.out.println("Account Number: " + accountNumber);
       System.out.println("Balance: " + balance);
       System.out.println("Bank Name: " + bankName);
       System.out.println("Interest Rate: " + interestRate);
   }

   public static void main(String[] args) {
       Scanner scanner = new Scanner(System.in);
```



```java
        System.out.println("Enter account number for account 1: ");
        int accountNumber1 = scanner.nextInt();
        System.out.println("Enter balance for account 1: ");
        double balance1 = scanner.nextDouble();
        BankAccount account1 = new BankAccount(accountNumber1, balance1);

        System.out.println("Enter account number for account 2: ");
        int accountNumber2 = scanner.nextInt();
        System.out.println("Enter balance for account 2: ");
        double balance2 = scanner.nextDouble();
        BankAccount account2 = new BankAccount(accountNumber2, balance2);

        System.out.println("Enter account number for account 3: ");
        int accountNumber3 = scanner.nextInt();
        System.out.println("Enter balance for account 3: ");
        double balance3 = scanner.nextDouble();
        BankAccount account3 = new BankAccount(accountNumber3, balance3);

        System.out.println("Bank Details:");
        System.out.println("Bank Name: " + BankAccount.getBankName());
        System.out.println("Interest Rate: " + BankAccount.getInterestRate());

        System.out.println("\nAccount 1 Details:");
        account1.printDetails();

        System.out.println("\nAccount 2 Details:");
        account2.printDetails();

        System.out.println("\nAccount 3 Details:");
        account3.printDetails();

        scanner.close();
    }
}
```

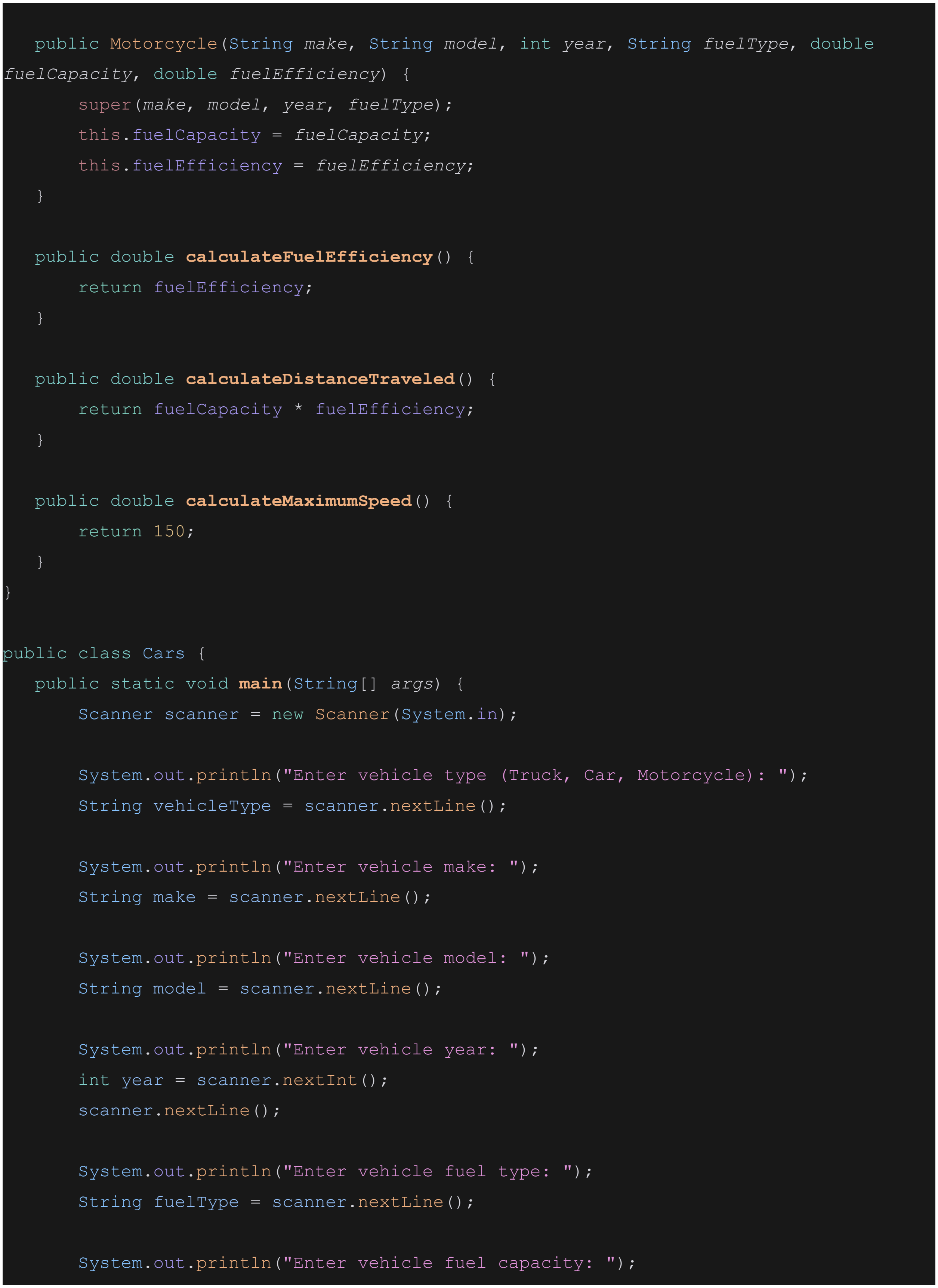
```
hitarth@Shadow Lab session % cd "/Users/hitarth/Desktop/ISU/SFT/SEM2/Sprint1/Lab session/HItarthPatel_150096724046_7Feb2025_LabSession/" && javac BankAccount
.java && java BankAccount
Enter account number for account 1:
1234
Enter balance for account 1:
6789
Enter account number for account 2:
2345
Enter balance for account 2:
7890
Enter account number for account 3:
3456
Enter balance for account 3:
8901
Bank Details:
Bank Name: XYZ Bank
Interest Rate: 0.05

Account 1 Details:
Account Number: 1234
Balance: 6789.0
Bank Name: XYZ Bank
Interest Rate: 0.05

Account 2 Details:
Account Number: 2345
Balance: 7890.0
Bank Name: XYZ Bank
Interest Rate: 0.05

Account 3 Details:
Account Number: 3456
Balance: 8901.0
Bank Name: XYZ Bank
Interest Rate: 0.05
```

2.Write a Java program to create a vehicle class hierarchy. The base class should be Vehicle, with subclasses Truck, Car and Motorcycle. Each subclass should have properties such as make, model, year, and fuel type. Implement methods for calculating fuel efficiency, distance traveled, and maximum speed.

→

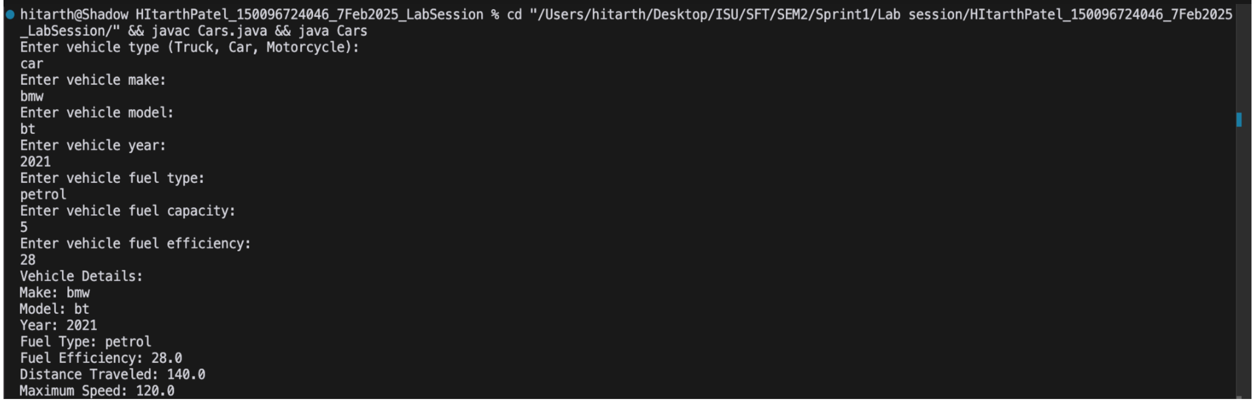
```java
import java.util.Scanner;

class Vehicle {
   protected String make;
   protected String model;
   protected int year;
   protected String fuelType;

   public Vehicle(String make, String model, int year, String fuelType) {
       this.make = make;
       this.model = model;
       this.year = year;
       this.fuelType = fuelType;
   }

   public double calculateFuelEfficiency() {
       return 0;
   }

   public double calculateDistanceTraveled() {
       return 0;
   }

   public double calculateMaximumSpeed() {
       return 0;
   }
}

class Truck extends Vehicle {
   private double fuelCapacity;
   private double fuelEfficiency;

   public Truck(String make, String model, int year, String fuelType, double
fuelCapacity, double fuelEfficiency) {
       super(make, model, year, fuelType);
       this.fuelCapacity = fuelCapacity;
       this.fuelEfficiency = fuelEfficiency;
```

```
    }

    public double calculateFuelEfficiency() {
        return fuelEfficiency;
    }

    public double calculateDistanceTraveled() {
        return fuelCapacity * fuelEfficiency;
    }

    public double calculateMaximumSpeed() {
        return 100;
    }
}

class Car extends Vehicle {
    private double fuelCapacity;
    private double fuelEfficiency;

    public Car(String make, String model, int year, String fuelType, double
fuelCapacity, double fuelEfficiency) {
        super(make, model, year, fuelType);
        this.fuelCapacity = fuelCapacity;
        this.fuelEfficiency = fuelEfficiency;
    }

    public double calculateFuelEfficiency() {
        return fuelEfficiency;
    }

    public double calculateDistanceTraveled() {
        return fuelCapacity * fuelEfficiency;
    }

    public double calculateMaximumSpeed() {
        return 120;
    }
}

class Motorcycle extends Vehicle {
    private double fuelCapacity;
    private double fuelEfficiency;
```



```
   public Motorcycle(String make, String model, int year, String fuelType, double
fuelCapacity, double fuelEfficiency) {
       super(make, model, year, fuelType);
       this.fuelCapacity = fuelCapacity;
       this.fuelEfficiency = fuelEfficiency;
   }

   public double calculateFuelEfficiency() {
       return fuelEfficiency;
   }

   public double calculateDistanceTraveled() {
       return fuelCapacity * fuelEfficiency;
   }

   public double calculateMaximumSpeed() {
       return 150;
   }
}

public class Cars {
   public static void main(String[] args) {
       Scanner scanner = new Scanner(System.in);

       System.out.println("Enter vehicle type (Truck, Car, Motorcycle): ");
       String vehicleType = scanner.nextLine();

       System.out.println("Enter vehicle make: ");
       String make = scanner.nextLine();

       System.out.println("Enter vehicle model: ");
       String model = scanner.nextLine();

       System.out.println("Enter vehicle year: ");
       int year = scanner.nextInt();
       scanner.nextLine();

       System.out.println("Enter vehicle fuel type: ");
       String fuelType = scanner.nextLine();

       System.out.println("Enter vehicle fuel capacity: ");
```

```java
        double fuelCapacity = scanner.nextDouble();
        scanner.nextLine();

        System.out.println("Enter vehicle fuel efficiency: ");
        double fuelEfficiency = scanner.nextDouble();
        scanner.nextLine();

        Vehicle vehicle = null;
        if (vehicleType.equalsIgnoreCase("Truck")) {
            vehicle = new Truck(make, model, year, fuelType, fuelCapacity,
fuelEfficiency);
        } else if (vehicleType.equalsIgnoreCase("Car")) {
            vehicle = new Car(make, model, year, fuelType, fuelCapacity,
fuelEfficiency);
        } else if (vehicleType.equalsIgnoreCase("Motorcycle")) {
            vehicle = new Motorcycle(make, model, year, fuelType, fuelCapacity,
fuelEfficiency);
        }

        if (vehicle != null) {
            System.out.println("Vehicle Details:");
            System.out.println("Make: " + vehicle.make);
            System.out.println("Model: " + vehicle.model);
            System.out.println("Year: " + vehicle.year);
            System.out.println("Fuel Type: " + vehicle.fuelType);
            System.out.println("Fuel Efficiency: " +
vehicle.calculateFuelEfficiency());
            System.out.println("Distance Traveled: " +
vehicle.calculateDistanceTraveled());
            System.out.println("Maximum Speed: " + vehicle.calculateMaximumSpeed());
        } else {
            System.out.println("Invalid vehicle type.");
        }

        scanner.close();
    }
}
```



```
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  _LabSession/" && javac Cars.java && java Cars
  Enter vehicle type (Truck, Car, Motorcycle):
  car
  Enter vehicle make:
  bmw
  Enter vehicle model:
  bt
  Enter vehicle year:
  2021
  Enter vehicle fuel type:
  petrol
  Enter vehicle fuel capacity:
  5
  Enter vehicle fuel efficiency:
  28
  Vehicle Details:
  Make: bmw
  Model: bt
  Year: 2021
  Fuel Type: petrol
  Fuel Efficiency: 28.0
  Distance Traveled: 140.0
  Maximum Speed: 120.0
```