CDAC Mumbai PG-DAC August 24

Assignment No-5

1) Create a base class BankAccount with methods like deposit() and withdraw(). Derive a class SavingsAccount that overrides the withdraw() method to impose a limit on the withdrawal amount. Write a program that demonstrates the use of overridden methods and proper access modifiers & return the details.

```
package in.cdac;
class BankAccount {
    private double balance;
    public BankAccount(double initialBalance) {
       this.balance = initialBalance;
    public void deposit(double amount) {
       if (amount > 0) {
         balance += amount;
       }
    }
    public void withdraw(double amount) {
      if (amount > 0 \&\& amount <= balance) {
         balance -= amount:
       }
    public double getBalance() {
       return balance;
  class SavingsAccount extends BankAccount {
    private static final double WITHDRAWAL LIMIT = 10000;
    public SavingsAccount(double initialBalance) {
       super(initialBalance);
    @Override
    public void withdraw(double amount) {
       if (amount > 0 && amount <= getBalance() && amount <= WITHDRAWAL_LIMIT) {
```

```
super.withdraw(amount);
}

public class Account {
    public static void main(String[] args) {
        SavingsAccount account = new SavingsAccount(15000);
        account.deposit(2000);
        account.withdraw(5000);
        account.withdraw(12000);

        System.out.println("Current Balance: ₹" + account.getBalance());
    }
```

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                                                                                                  class BankAccount {
    private double balance;
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                                                                                                                   public BankAccount(double initialBalance) {
    this.balance = initialBalance;
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Di Mainjava
Di Programmjava
Di Employeejava
Di Programjava
Di Programjava
                                                                                                                   public void deposit(double amount) {
   if (amount > 0) {
      balance += amount;
}
                                                                                                                   public void withdraw(double amount) {
  if (amount > 0 && amount <= balance) {
    balance -= amount;</pre>

    Arithematicswitch.java
    BMITracker.java

ByteTest.java
Calculator.java
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DefaultValuesTest.java
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   return balance;
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Intrest,java
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ShortTest,java
                                                                                                            class SavingsAccount extends BankAccount {
  private static final double WITHDRAWAL_LIMIT = 10000;
                                                                                                                   public SavingsAccount(double initialBalance) {
    super(initialBalance);
                                                                                                                   @Override
public void withdraw(double amount) {
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                                                                                                                              if (amount > 0 && amount <= getBalance() && amount <= WITHDRAWAL_I
```

2) Create a base class Vehicle with attributes like make and year. Provide a constructor in Vehicle to initialize these attributes. Derive a class Car that has an additional attribute model and write a constructor that initializes make, year, and model. Write a program to create a Car object and display its details.

```
package in.cdac;
class Vehicle {
  protected String make;
  protected int year;
  public Vehicle(String make, int year) {
     this.make = make;
     this.year = year;
  public void displayDetails() {
     System.out.println("Make: " + make);
     System.out.println("Year: " + year);
}
class Car extends Vehicle {
  private String model;
  public Car(String make, int year, String model) {
     super(make, year);
     this.model = model;
  @Override
  public void displayDetails() {
     super.displayDetails();
     System.out.println("Model: " + model);
public class Inher {
  public static void main(String[] args) {
     Car car = new Car("Toyota", 2020, "Camry");
     car.displayDetails();
}
```

```
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                                                                                                 3 class Vehicle {
4    protected String make;
5    protected int year;
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                                                                                                               public Vehicle(String make, int year) {
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this.year = year;
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                                                                                                               public void displayDetails() {
    System.out.println("Make: " + make);
    System.out.println("Year: " + year);
                Mainjava
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in.Example
Employee.java
Program.java
                                                                                          18 class Car extends Vehicle {
19     private String model;
20     public Car(String make,
21     super(make, year);
23     this.model = model;
24     }
25     @Override
27     public void displayDetais
28     super.displayDetails
29     System.out.println(**)
30     }
31 }
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Arithematicswitch.java
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                                                                                                               public Car(String make, int year, String model) {
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                ☐ Calculator,java
☐ Conversion,java
☐ DefaultValuesTest,java
☑ DoubleTest,java
☑ Employee,java
☑ Employee1,java
☑ FloatTest,java
                                                                                                               public void displayDetails() {
   super.displayDetails();
   System.out.println("Model: " + model);
                  hello.java
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☑ IntTest,java
☑ LongTest,java
☑ package-info,java
☑ ShortTest,java
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```

3) Create a base class Animal with attributes like name, and methods like eat() and sleep(). Create a subclass Dog that inherits from Animal and has an additional method bark(). Write a program to demonstrate the use of inheritance by creating objects of Animal and Dog and calling their methods.

```
package in.cdac;
class Animal {

protected String name;
public Animal(String name) {
    this.name = name;
}

public void eat() {
    System.out.println(name + " is eating.");
}

public void sleep() {
    System.out.println(name + " is sleeping.");
}

class Dog extends Animal {
```

```
public Dog(String name) {
  super(name);
}
public void bark() {
  System.out.println(name + " is barking.");
}
}
public class Main {
public static void main(String[] args) {
  Animal animal = new Animal("Generic Animal");
  animal.eat();
  animal.sleep();
  System.out.println();
  Dog dog = new Dog("Buddy");
  dog.eat();
  dog.sleep();
  dog.bark();
}
```

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Generic Animal is sleeping.
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Buddy is sleeping.
Buddy is barking.

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9     this.name = name;
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13** public void eat() {
14** System.out.println(name + " is eating.");
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② Aeroplane.java
② Aeroplane1.java
② Duplicates.java
② Intersection.java
③ Mainmethod.java

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                                                                                                                                                                         24 class Dog extends Animal {
                    26  public Dog(String name) {
27     super(name);
                                                                                                                                                                         public void bark() {
32    System.out.println(name + " is barking.");
                       Conversion.java
Conversion2.java
                                                                                                                                                                         37 public class Main {
```

4) Build a class Student which contains details about the Student and compile and run its instance.

```
package in.cdac;
  class Student {
       private String Name;
       private int Rollnumber;
       private String City;
       private int DOB;
       public Student(String name, int rollnumber, String city, int dOB) {
              this. Name = name;
              this.Rollnumber = rollnumber;
              this. City = city;
              this.DOB = dOB;
       public void printStudentDetails() {
    System.out.println("Student Details:");
    System.out.println("Name: " + Name);
     System.out.println("Roll Number: " + Rollnumber);
     System.out.println("City: " + City);
     System.out.println("Year of Birth (DOB): " + DOB);
        class Inheritance1{
              public static void main(String[] args) {
```

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                                                                                                                                                                                                  3 class Student {

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                                                                                                                                                                                                                                         class Student {
  private String Name;
  private int Rollnumber;
  private String City;
  private int DOB:
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Roll Number: 101
City: Mumbai
Year of Birth (DOB): 2000
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                                                                                                                                                                                                                                       public Student(String name, int rollnumber, String city, int dOB) {
    this.Name = name;
    this.Rollnumber = rollnumber;
}
                                                                                                                                                                                                                                                             this.City = city;
this.DOB = dOB;
                                  Aeroplane.java
                                                                                                                                                                                                                                          public void printStudentDetails() {
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Duplicates.java
                                                                                                                                                                                                                                                             lic void printStudentDetails() {
    System.out.println("Student Details:");
    System.out.println("Name: " + Name);
    System.out.println("Roll Number: " + Rollnumber);
    System.out.println("City: " + City);
    System.out.println("Year of Birth (DOB): " + DOB);
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```

5) Write a Java program to create a base class Vehicle with methods startEngine() and stopEngine(). Create two subclasses Car and Motorcycle. Override the startEngine() and stopEngine() methods in each subclass to start and stop the engines differently.

```
package in.cdac;
class Vehicle {
  public void startEngine() {
    System.out.println("Vehicle engine is starting...");
  }
  public void stopEngine() {
    System.out.println("Vehicle engine is stopping...");
  }
}

class Car extends Vehicle {
  @Override
  public void startEngine() {
    System.out.println("Car engine is starting with a key...");
  }
}
```

```
@Override
public void stopEngine() {
  System.out.println("Car engine is stopping...");
}
class Motorcycle extends Vehicle {
@Override
public void startEngine() {
   System.out.println("Motorcycle engine is starting with a kick...");
@Override
public void stopEngine() {
  System.out.println("Motorcycle engine is stopping...");
  public class Programm {
  public static void main(String[] args) {
       Vehicle myCar = new Car();
  myCar.startEngine();
   myCar.stopEngine();
  System.out.println();
   Vehicle myMotorcycle = new Motorcycle();
   myMotorcycle.startEngine();
  myMotorcycle.stopEngine();
```

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