**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** ass5Lab1.example;

**import** java.util.Scanner;

**class** BankAccount {

**private** String accountNumber;

**private** **double** balance;

**public** BankAccount(String accountNumber, **double** initialBalance) {

**this**.accountNumber = accountNumber;

**this**.balance = initialBalance;

}

**public** **void** deposit(**double** amount) {

**if** (amount > 0) {

balance += amount;

System.***out***.println("Deposited: " + amount);

} **else** {

System.***out***.println("Invalid deposit amount");

}

}

**public** **boolean** withdraw(**double** amount) {

**if** (amount > 0 && amount <= balance) {

balance -= amount;

System.***out***.println("Withdrew: " + amount);

**return** **true**;

} **else** {

System.***out***.println("Invalid withdraw amount or insufficient balance");

**return** **false**;

}

}

**public** String getAccountNumber() {

**return** accountNumber;

}

**public** **double** getBalance() {

**return** balance;

}

@Override

**public** String toString() {

**return** "Account Number: " + accountNumber + ", Balance: " + balance;

}

}

**class** SavingsAccount **extends** BankAccount {

**private** **static** **final** **double** ***WITHDRAWAL\_LIMIT*** = 1000.0;

**public** SavingsAccount(String accountNumber, **double** initialBalance) {

**super**(accountNumber, initialBalance);

}

@Override

**public** **boolean** withdraw(**double** amount) {

**if** (amount > ***WITHDRAWAL\_LIMIT***) {

System.***out***.println("Withdrawal amount exceeds the limit of " + ***WITHDRAWAL\_LIMIT***);

**return** **false**;

} **else** {

**return** **super**.withdraw(amount);

}

}

}

**public** **class** Program1 {

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

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

System.***out***.print("Enter Savings Account Number: ");

String accountNumber = sc.nextLine();

System.***out***.print("Enter Initial Balance: ");

**double** initialBalance = sc.nextDouble();

SavingsAccount savingsAccount = **new** SavingsAccount(accountNumber, initialBalance);

System.***out***.print("Enter amount to deposit: ");

**double** depositAmount = sc.nextDouble();

savingsAccount.deposit(depositAmount);

System.***out***.print("Enter amount to withdraw: ");

**double** withdrawAmount = sc.nextDouble();

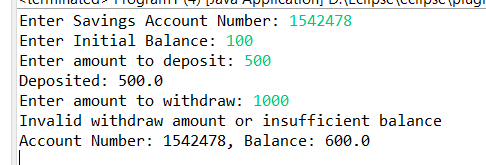
savingsAccount.withdraw(withdrawAmount);

System.***out***.println(savingsAccount);

sc.close();

}

}



1. 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** ass5Lab1.example;

**class** Vehicle{

**private** String make;

**private** **int** year;

**public** Vehicle(String make,**int** year) {

**this**.make=make;

**this**.year=year;

}

**public** String getMake() {

**return** make;

}

**public** **int** getYear() {

**return** year;

}

}

**class** Car **extends** Vehicle{

String model;

**public** Car(String make,**int** year,String model) {

**super**(make, year);

**this**.model=model;

}

**public** String getModel() {

**return** model;

}

**public** **void** display()

{

System.***out***.println("Make:"+getMake());

System.***out***.println("Make:"+getYear());

System.***out***.println("Make:"+getModel());

}

}

**public** **class** Program2 {

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

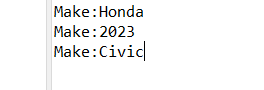
// **TODO** Auto-generated method stub

Car c=**new** Car("Honda",2023,"Civic");

c.display();

}

}



1. 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** ass5Lab1.example;

**class** Animal{

**private** String name;

**public** Animal(String name){

**this**.name=name;

}

**public** **void** eat() {

System.***out***.println(name+" can eat");

}

**public** **void** sleep() {

System.***out***.println(name+" can sleep");

}

**public** String getName() {

**return** name;

}

}

**class** Dog **extends** Animal{

**public** Dog(String name) {

**super**(name);

}

**public** **void** bark() {

System.***out***.println(getName()+" can bark");

}

}

**public** **class** Program3 {

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

// **TODO** Auto-generated method stub

Animal a=**new** Animal("Tiger");

a.eat();

a.sleep();

Dog d=**new** Dog("Lion");

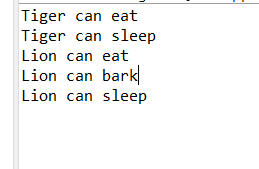
d.eat();

d.bark();

d.sleep();

}

}



1. Build a class Student which contains details about the Student and compile and run its

instance.

**package** ass5Lab1.example;

**class** Student{

**private** String name;

**private** **int** rollNo;

**public** Student(String name,**int** rollNo) {

**this**.name=name;

**this**.rollNo=rollNo;

}

**public** String toString() {

**return** "Name:"+name+" "+"Roll no:"+rollNo;

}

}

**public** **class** Program4 {

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

// **TODO** Auto-generated method stub

Student s1=**new** Student("Ram",21);

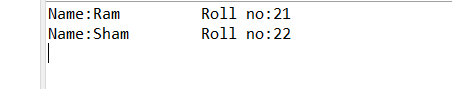
Student s2=**new** Student("Sham",22);

System.***out***.println(s1.toString());

System.***out***.println(s2.toString());

}

}



1. 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** ass5Lab1\_1.example;

**class** Vehicle{

**public** **void** startEngine() {

System.***out***.println("Vehicle Engine Started");

}

**public** **void** stopEngine() {

System.***out***.println("Vehicle Engine Stopped");

}

}

**class** Car **extends** Vehicle{

**public** **void** startEngine() {

System.***out***.println("Car Engine Started");

}

**public** **void** stopEngine() {

System.***out***.println("Car Engine Stopped");

}

}

**class** Motorcycle **extends** Vehicle{

**public** **void** startEngine() {

System.***out***.println("Motorcycle Engine Started");

}

**public** **void** stopEngine() {

System.***out***.println("Motorcycle Car Engine Stopped");

}

}

**public** **class** Program5 {

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

// **TODO** Auto-generated method stub

Vehicle v=**new** Vehicle();

v.startEngine();

v.stopEngine();

Car c=**new** Car();

c.startEngine();

c.stopEngine();

Motorcycle m=**new** Motorcycle();

m.startEngine();

m.stopEngine();

}

}

