1.Write a Java program that demonstrates method overriding by creating a superclass called Animal and two subclasses called Dog and Cat. ● The Animal class should have a method called makeSound(), which simply prints "The animal makes a sound." ● The Dog and Cat classes should override this method to print "TheCat/The dog meows/barks" respectively. ● The program should allow the user to create and display objects of each class.

Solution:

class Animal {

public void makeSound() {

System.out.println("The animal makes a sound.");

}

}

class Dog extends Animal {

@Override

public void makeSound() {

System.out.println("The dog barks.");

}

}

class Cat extends Animal

@Override

public void makeSound() {

System.out.println("The cat meows.");

}

}

public class Main {

public static void main(String[] args) {

Animal animal = new Animal();

Dog dog = new Dog();

Cat cat = new Cat();

System.out.println("Sound of the animal:");

animal.makeSound();

System.out.println("\nSound of the dog:");

dog.makeSound();

System.out.println("\nSound of the cat:");

cat.makeSound();

}

}

Output:

Sound of the animal:

The animal makes a sound.

Sound of the dog:

The dog barks.

Sound of the cat:

The cat meows.

2.Create one superclass HillStations and three subclasses Manali, Mussoorie, Gulmarg. Subclasses extend the superclass and override its location() and famousFor() method. i.call the location() and famousFor() method by the Parent class’, i.e. Hillstations class. As it refers to the base class object and the base class method overrides the superclass method; the base class method is invoked at runtime. ii.call the location() and famousFor() method by the all subclass’,and print accordingly

Solution:

class HillStations {

void location() {

System.out.println("Location: Varies depending on the hill station");

}

void famousFor() {

System.out.println("Famous for: Varies depending on the hill station");

}

}

class Manali extends HillStations {

void location() {

System.out.println("Location: Manali is located in Himachal Pradesh, India");

}

void famousFor() {

System.out.println("Famous for: Adventure sports and scenic beauty");

}

}

class Mussoorie extends HillStations {

void location() {

System.out.println("Location: Mussoorie is located in Uttarakhand, India");

}

void famousFor() {

System.out.println("Famous for: Lush green hills and colonial architecture");

}

}

class Gulmarg extends HillStations {

void location() {

System.out.println("Location: Gulmarg is located in Jammu and Kashmir, India");

}

void famousFor() {

System.out.println("Famous for: Skiing and snow-capped mountains");

}

}

public class Main {

public static void main(String[] args) {

HillStations manali = new Manali();

HillStations mussoorie = new Mussoorie();

HillStations gulmarg = new Gulmarg();

System.out.println("Calling location and famousFor using superclass reference:");

manali.location();

manali.famousFor();

mussoorie.location();

mussoorie.famousFor();

gulmarg.location();

gulmarg.famousFor();

System.out.println("\nCalling location and famousFor using subclass reference:");

((Manali) manali).location();

((Manali) manali).famousFor();

((Mussoorie) mussoorie).location();

((Mussoorie) mussoorie).famousFor();

((Gulmarg) gulmarg).location();

((Gulmarg) gulmarg).famousFor();

}

## }

Output:

Calling location and famousFor using superclass reference:

Location: Varies depending on the hill station

Famous for: Varies depending on the hill station

Location: Varies depending on the hill station

Famous for: Varies depending on the hill station

Location: Varies depending on the hill station

Famous for: Varies depending on the hill station

Calling location and famousFor using subclass reference:

Location: Manali is located in Himachal Pradesh, India

Famous for: Adventure sports and scenic beauty

Location: Mussoorie is located in Uttarakhand, India

Famous for: Lush green hills and colonial architecture

Location: Gulmarg is located in Jammu and Kashmir, India

Famous for: Skiing and snow-capped mountains