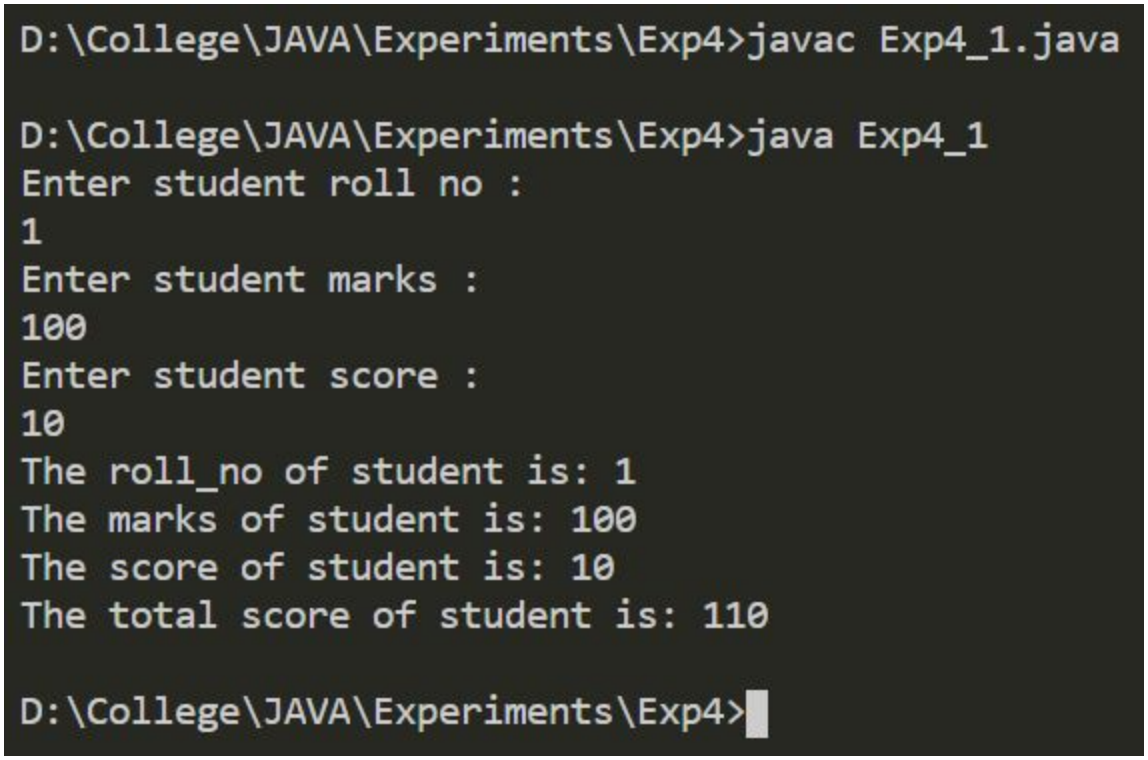
Program 1:

```java
import java.util.Scanner;

//defining interface student
interface Student{
    void getRoll_no();
    void setRoll_no();
}
//Interface test inherits interface student
interface Test extends Student{
    void getMarks();
    void setMarks();
}
//interface sports inherits interface Student
interface Sports extends Student{
    void getScore();
    void setScore();
}

//class result inherits interfaces test and sports
class Result implements Test, Sports{

    private int roll_no, marks, score;

    Scanner scanner = new Scanner(System.in);

    //Implementing inherited abstract methods
    public void getRoll_no() {
        System.out.println("The roll_no of student is: " + roll_no);
    }

    public void setRoll_no() {
        System.out.println("Enter student roll no : ");
        roll_no = scanner.nextInt();
    }

    public void getMarks() {
        System.out.println("The marks of student is: " + marks);
    }
```

```java
    public void setMarks() {
        System.out.println("Enter student marks : ");
        marks = scanner.nextInt();
    }

    public void getScore() {
        System.out.println("The score of student is: " + score);
    }

    public void setScore() {
        System.out.println("Enter student score : ");
        score = scanner.nextInt();
    }
    //Method to display total
    public void getTotal() {
        System.out.println("The total score of student is: " + (marks+score));
    }
}

//Driver class
public class Exp4_1{
    public static void main(String[] args) {

        //Object of class result
        Result res = new Result();
        res.setRoll_no();
        res.setMarks();
        res.setScore();

        //Displaying result
        res.getRoll_no();
        res.getMarks();
        res.getScore();
        res.getTotal();
    }
}
```

Output:


D:\College\JAVA\Experiments\Exp4>javac Exp4_1.java
D:\College\JAVA\Experiments\Exp4>java Exp4_1
Enter student roll no :
1
Enter student marks :
100
Enter student score :
10
The roll_no of student is: 1
The marks of student is: 100
The score of student is: 10
The total score of student is: 110
D:\College\JAVA\Experiments\Exp4>

Program 2:

```
/**
 * Create an interface vehicle and classes like bicycle, car, bike etc, having
 *common functionalities and put all the common functionalities in the
 *interface. Classes like Bicycle, Bike, car etc implement all these
 *functionalities in their own class in their own way.
 */
import java.util.Scanner;
//Defining interface Vehicle
interface Vehicle{
    void wheelsCount();
    void bodyColor();
    void seats();
    void setData();
}
//Class bicycle inherits interface vehicle
class Bicycle implements Vehicle{
    private String color;
    private int seats,count;
    //Implementing inherited abstract methods
    Scanner scanner = new Scanner(System.in);
    public void wheelsCount(){
        System.out.println("Bicycle has " + count + " wheels.");
    }
    public void bodyColor(){
        System.out.println("Bicycle is " + color + " in color.");
    }
    public void  seats(){
        System.out.println("Bicycle has " + seats +" seat.");
    }
    public void setData(){
        System.out.println("Enter number of wheels, body colour and number of
seats:");
        count=scanner.nextInt();
        color = scanner.next();
        seats = scanner.nextInt();
    }
}
class Bike implements Vehicle{
```

```
    private String color;
    private int seats,count;
    //Implementing inherited abstract methods
    Scanner scanner = new Scanner(System.in);
    public void wheelsCount(){
        System.out.println("Bike has " + count + " wheels.");
    }
    public void bodyColor(){
        System.out.println("Bike is " + color + " in color.");
    }
    public void  seats(){
        System.out.println("Bike has " + seats +" seat.");
    }
    public void setData(){
        System.out.println("Enter number of wheels, body colour and number of
seats:");
        count=scanner.nextInt();
        color = scanner.next();
        seats = scanner.nextInt();
    }
}
class Car implements Vehicle{
    private String color;
    private int seats,count;
    Scanner scanner = new Scanner(System.in);
    //Implementing inherited abstract methods
    public void wheelsCount(){
        System.out.println("Car has " + count + " wheels.");
    }
    public void bodyColor(){
        System.out.println("Car is " + color + " in color.");
    }
    public void  seats(){
        System.out.println("Car has " + seats +" seat.");
    }
    public void setData(){
        System.out.println("Enter number of wheels, body colour and number of
seats:");
        count=scanner.nextInt();
```

```
        color = scanner.next();
        seats = scanner.nextInt();
    }
}
//Driver class
public class Exp4_2 {
    public static void main(String[] args) {
        //Object of class bike
        Bike bike = new Bike();
        System.out.println("Enter bike details");
        bike.setData();
        bike.wheelsCount();
        bike.seats();
        bike.bodyColor();
        //object of class bicycle
        Bicycle bicycle = new Bicycle();
        System.out.println("Enter bicycle details");
        bicycle.setData();
        bicycle.wheelsCount();
        bicycle.seats();
        bicycle.bodyColor();
        //object of class car
        Car car = new Car();
        System.out.println("Enter car details");
        car.setData();
        car.wheelsCount();
        car.seats();
        car.bodyColor();
    }
}
```

Output:

```
D:\College\JAVA\Experiments\Exp4>javac Exp4_2.java

D:\College\JAVA\Experiments\Exp4>java Exp4_2
Enter bike details
Enter number of wheels, body colour and number of seats:
2 red 2
Bike has 2 wheels.
Bike has 2 seat.
Bike is red in color.
Enter bicycle details
Enter number of wheels, body colour and number of seats:
2 blue 1
Bicycle has 2 wheels.
Bicycle has 1 seat.
Bicycle is blue in color.
Enter car details
Enter number of wheels, body colour and number of seats:
4 white 4
Car has 4 wheels.
Car has 4 seat.
Car is white in color.

D:\College\JAVA\Experiments\Exp4>
```

Questions:

Question 1:

```java
/**
 * Write a class PoliceCar that implements the IsEmergency and IsLandVehicle
interfaces. In addition to the methods you have written for the PoliceCar class,
think of a new method or property that police cars have and add it to the class.
 */

 //defining Interface isEmergency
interface IsEmergency{
    void Emergency();
}
//defining Interface isLandVehicle
interface IsLandVehicle{
    void LandVehicle();
}

//class policeCar inherits interfaces isEmergency and isLandVehicle
class PoliceCar implements IsEmergency, IsLandVehicle{

    private int no_seates;
    private String type;

    public int getNo_seates() {
        return no_seates;
    }

    public void setNo_seates(int no_seates) {
        this.no_seates = no_seates;
    }

    public String getType() {
        return type;
    }

    public void setType(String type) {
        this.type = type;
    }
```

```
    //implementing inherited abstract methods
    public void Emergency(){
        System.out.println("Emergency");
    }
    public void LandVehicle(){
        System.out.println("Car is a land vehicle");
    }

}

//Driver class
public class Question {
    public static void main(String[] args) {

        //Object of class PoliceCar
        PoliceCar pCar = new PoliceCar();
        pCar.setNo_seates(6);
        pCar.setType("SUV");
        System.out.println("The Police car has " + pCar.getNo_seates() + "
seates.");
        System.out.println("The Police car is a " + pCar.getType());
        pCar.LandVehicle();
        pCar.Emergency();
    }
}
```

Output:

```
D:\College\JAVA\Experiments\Exp4>javac Question.java

D:\College\JAVA\Experiments\Exp4>java Question
The Police car has 6 seates.
The Police car is a SUV
Car is a land vehicle
Emergency

D:\College\JAVA\Experiments\Exp4>
```