Q1.

Code:

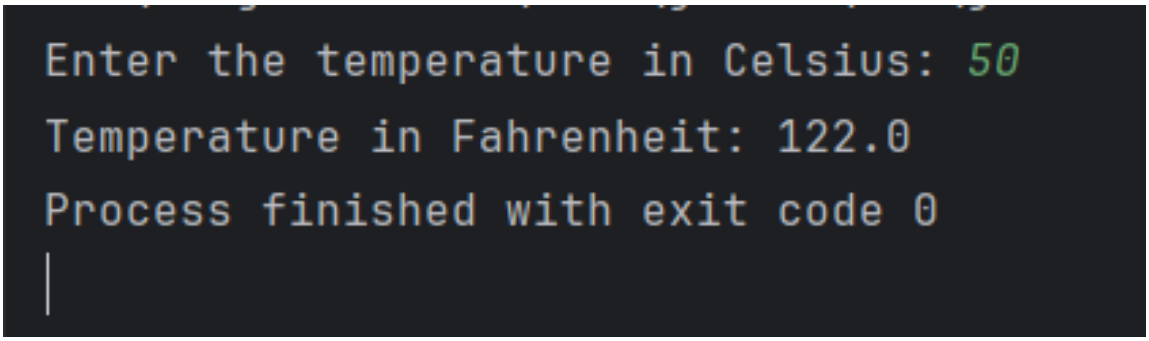
Main.java

```
package Q_01;

import java.util.Scanner;

public class Main {
    public static void main(String[] args) {

        //scanner class object to get the input from the user
        Scanner scanner = new Scanner(System.in);
        //creating object of Temperature class
        Temperature temperature = new Temperature();

        //taking input from the user
        System.out.print("Enter the temperature in Celsius: ");
        double celsius = scanner.nextDouble();

        //setting the value of celsius
        temperature.setCelsius(celsius);
        //displaying the temperature in Fahrenheit
        System.out.print("Temperature in Fahrenheit: " +
temperature.toFahrenheit());

    }
}
```

Temperature.java

```
package Q_01;

public class Temperature {
    private double celsius;

    //no argument constructor
    public Temperature() {
        this.celsius = 0;
    }

    //parameterized constructor
    public Temperature(double celsius) {
        this.celsius = celsius;
    }

    //getter method to get the value of celsius
    public double toCelsius() {
        return celsius;
    }

    //getter method to get the value of fahrenheit
    public double toFahrenheit() {
        return (celsius * 9 / 5 + 32);
    }

    //setter method to set the value of celsius
    public void setCelsius(double celsius) {
        this.celsius = celsius;
    }

    //setter method to set the value of fahrenheit
    public void setFahrenheit(double fahrenheit) {
        this.celsius = (fahrenheit - 32) * 5 / 9;
    }
}
```

Output:



Q2.

Code:

Main.java

```
package Q_02;

import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        //scanner class object to get the input from the user
        Scanner scanner = new Scanner(System.in);
        //creating object of Temperature class
        Temperature temperature = new Temperature();

        //taking input from the user
        System.out.print("Enter the temperature in Fahrenheit: ");
        double fahrenheit = scanner.nextDouble();

        //setting the value of fahrenheit
        temperature.setFahrenheit(fahrenheit);
        //displaying the temperature in Celsius
        System.out.print("Temperature in Celsius: " +
temperature.toCelsius());
    }
}
```

Temperature.java

```
package Q_02;

public class Temperature {
    private double celsius;

    //no argument constructor
    public Temperature() {
        this.celsius = 0;
    }

    //parameterized constructor
    public Temperature(double celsius) {
        this.celsius = celsius;
    }

    //getter method to get the value of celsius
    public double toCelsius() {
        return celsius;
    }

    //getter method to get the value of fahrenheit
    public double toFahrenheit() {
        return (celsius * 9 / 5 + 32);
    }

    //setter method to set the value of celsius
    public void setCelsius(double celsius) {
        this.celsius = celsius;
    }

    //setter method to set the value of fahrenheit
    public void setFahrenheit(double fahrenheit) {
        this.celsius = (fahrenheit - 32) * 5 / 9;
    }
}
```

Output:

```
Enter the temperature in Fahrenheit: 100
Temperature in Celsius: 37.77777777777778
Process finished with exit code 0
```

Q3.

Code:

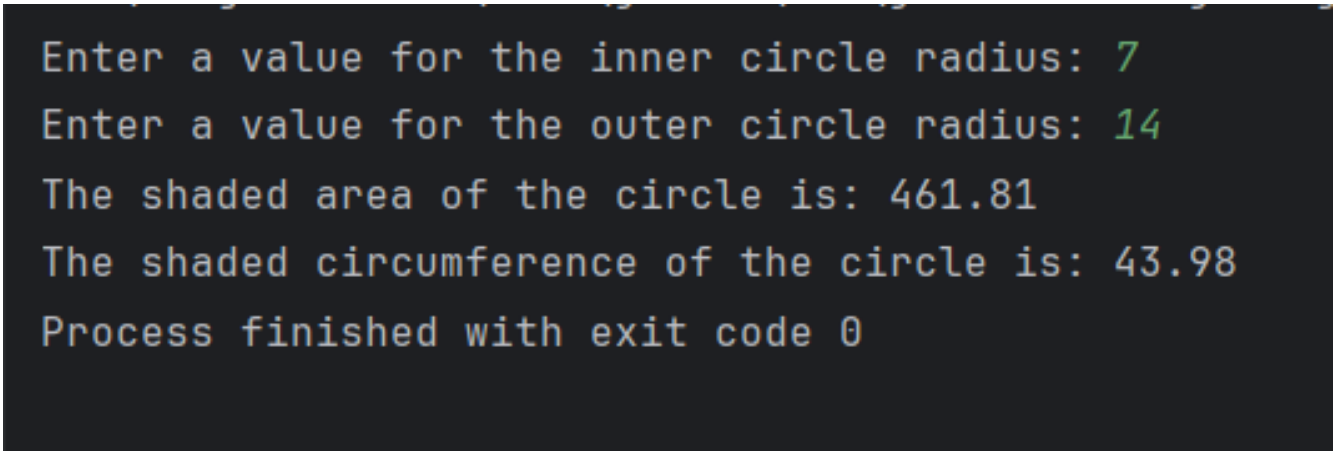
Main.java

```
package Q_03;

import java.text.DecimalFormat;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        double innerRadius;
        double outerRadius;

        //scanner object to take input from the user
        Scanner scanner = new Scanner(System.in);
        //DecimalFormat object to format the output
        DecimalFormat df = new DecimalFormat("#.##");

        //taking inner radius value from the user
        System.out.print("Enter a value for the inner circle radius: ");
        innerRadius = scanner.nextDouble();

        //taking uter radius value from the user
        System.out.print("Enter a value for the outer circle radius: ");
        outerRadius = scanner.nextDouble();

        //creating objects of Circle class
        Circle innerCircle = new Circle(innerRadius);
        Circle outerCircle = new Circle(outerRadius);

        //calculating the shaded area and circumference
        double area = outerCircle.computeArea()-
innerCircle.computeArea();
        double circumference = outerCircle.computeCircumference()-
innerCircle.computeCircumference();

        //printing the shaded area and circumference
        System.out.print("The shaded area of the circle is: "+
df.format(area)+"\nThe shaded circumference of the circle is:
"+df.format(circumference));
    }
}
```

Circle.java

```
package Q_03;

public class Circle {
    private double radius;

    //constructor to initialize the radius
    public Circle(double radius) {
        this.radius = radius;
    }

    //getter method to get the radius
    public void setRadius(double radius) {
        this.radius = radius;
    }

    //method to compute the area of the circle
    public double computeArea(){
        return (Math.PI * radius * radius);
    }

    //method to compute the circumference of the circle
    public double computeCircumference(){
        return (2 * Math.PI * radius);
    }
}
```

Output:



Q4.

Code:

Main.java

```
package Q_04;

public class Main {
    public static void main(String[] args) {
        // Create an owner object
        Owner owner = new Owner("Isala", "0712345678");
        // Create a bicycle object
        Bicycle tomahawk = new Bicycle(owner);

        // Print the owner name of the bicycle
        System.out.println(tomahawk.getBicycleOwner().getOwnerName());
    }
}
```

Bicycle.java

```
package Q_04;

public class Bicycle {
    Owner bicycleOwner;

    // Constructor for the bicycle class
    public Bicycle(Owner bicycleOwner) {
        this.bicycleOwner = bicycleOwner;
    }

    // Getter and setter for the bicycle owner
    public Owner getBicycleOwner() {
        return bicycleOwner;
    }

    public void setBicycleOwner(Owner bicycleOwner) {
        this.bicycleOwner = bicycleOwner;
    }
}
```

Owner.java

```
package Q_04;

public class Owner {
    private String ownerName;
    private String phoneNo;

    // Constructor for the owner class
    public Owner(String ownerName, String phoneNo) {
        this.ownerName = ownerName;
        this.phoneNo = phoneNo;
    }

    // Getter and setter for the owner name
    public String getOwnerName() {
        return ownerName;
    }

    public void setOwnerName(String ownerName) {
        this.ownerName = ownerName;
    }

    // Getter and setter for the phone number
    public String getPhoneNo() {
        return phoneNo;
    }

    public void setPhoneNo(String phoneNo) {
        this.phoneNo = phoneNo;
    }
}
```

Output:

```
Isala


Process finished with exit code 0
```

Q5.

Code:

Main.java

```
package Q_05;

public class Main {
    public static void main(String[] args) {
        //crating an object of Course class
        Course oop = new Course();
        //setting values to the object
        oop.setCourseName("Object Oriented Programming");
        oop.setCourseCode("CTEC22043");

        //creating an object of Lecturer class
        Lecturer kumar = new Lecturer();
        //setting values to the object
        kumar.setLecturerName("Kumar");
        kumar.setCourseTeaching("Object Oriented Programming");

        //creating an object of Student class
        Student sanga = new Student();
        //setting values to the object
        sanga.setStudentName("Sanga");
        sanga.setDegreeName("Information and Communication Technology");
        sanga.setCourseFollowing("Object Oriented Programming");

        //setting lecturerInCharge to the course
        oop.setLecturerInCharge(kumar);

        //displaying the student details
        System.out.println("Student Details: ");
        System.out.println("Name: "+sanga.getStudentName());
        System.out.println("Course Following:
"+sanga.getCourseFollowing());
        System.out.println("Degree Name: "+sanga.getDegreeName()+"\n");

        //displaying the course details
        System.out.println("Course Details: ");
        System.out.println("Course Name: "+oop.getCourseName());
        System.out.println("Course Code: "+oop.getCourseCode());
        System.out.println("Lecturer In Charge:
"+oop.getLecturerInCharge().getLecturerName()+"\n");
```

```
        //displaying the lecturer details
        System.out.println("Lecturer Details: ");
        System.out.println("Lecturer Name: "+kumar.getLecturerName());
        System.out.println("Courses Teaching:
"+kumar.getCourseTeaching()+"\n");
    }
}
```

Course.java

```
package Q_05;

public class Course {

    private String courseName;
    private String courseCode;
    private Lecturer lecturerInCharge;

    //getter method for courseName
    public String getCourseName() {
        return courseName;
    }

    //setter method for courseName
    public void setCourseName(String courseName) {
        this.courseName = courseName;
    }

    //getter method for courseCode
    public String getCourseCode() {
        return courseCode;
    }

    //setter method for courseCode
    public void setCourseCode(String courseCode) {
        this.courseCode = courseCode;
    }

    //getter method for lecturerInCharge
    public Lecturer getLecturerInCharge() {
        return lecturerInCharge;
    }

    //setter method for lecturerInCharge
    public void setLecturerInCharge(Lecturer lecturerInCharge) {
        this.lecturerInCharge = lecturerInCharge;
    }
}
```

Lecturer.java

```
package Q_05;

public class Lecturer {

    private String lecturerName;
    private String courseTeaching;

    //getter method for lecturerName
    public String getLecturerName() {
        return lecturerName;
    }

    //setter method for lecturerName
    public void setLecturerName(String lecturerName) {
        this.lecturerName = lecturerName;
    }

    //getter method for courseTeaching
    public String getCourseTeaching() {
        return courseTeaching;
    }

    //setter method for courseTeaching
    public void setCourseTeaching(String courseTeaching) {
        this.courseTeaching = courseTeaching;
    }
}
```

Student.java

```
package Q_05;

public class Student {
    private String studentName;
    private String degreeName;
    private String courseFollowing;

    //getter method for studentName
    public String getStudentName() {
        return studentName;
    }

    //setter method for studentName
    public void setStudentName(String studentName) {
        this.studentName = studentName;
    }

    //getter method for degreeName
    public String getDegreeName() {
        return degreeName;
    }

    //setter method for degreeName
    public void setDegreeName(String degreeName) {
        this.degreeName = degreeName;
    }

    //getter method for courseFollowing
    public String getCourseFollowing() {
        return courseFollowing;
    }

    //setter method for courseFollowing
    public void setCourseFollowing(String courseFollowing) {
        this.courseFollowing = courseFollowing;
    }
}
```

Output:

```
Student Details:
Name: Sanga
Course Following: Object Oriented Programming
Degree Name: Information and Communication Technology

Course Details:
Course Name: Object Oriented Programming
Course Code: CTEC22043
Lecturer In Charge: Kumar

Lecturer Details:
Lecturer Name: Kumar
Courses Teaching: Object Oriented Programming


Process finished with exit code 0
```