CYCLE- 3

1. Area of different shapes using overloaded functions.

CODE:

```
import java.util.Scanner;
public class Overload {
  void calculateArea(float x) {
    System.out.println("Area of the square: "+x*x+ "sq units");
  }

  void calculateArea(float x, float y) {
    System.out.println("\nArea of rectangle: " +x*y+ "sq units");
  }

  void calculateArea(double r) {
    double area = 3.14*r*r;
    System.out.println("\nArea of the circle: " +area+ "sq units");
  }

  public static void main(String args[]) {
  System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and Name: 20MCA132, Object Oriented Programming Lab\nDate:02/06/2023\n\n");
    Overload obj = new Overload();
    System.out.println("Enter the side of the square: ");
    Scanner sc = new Scanner(System.in);
    float side = sc.nextFloat();
    obj.calculateArea(side);
```

```
    System.out.println("\nEnter sides of the rectangle: ");
    float side1 = sc.nextFloat();
    float side2 = sc.nextFloat();
    obj.calculateArea(side1, side2);


    System.out.println("\nEnter the radius of the circle: ");
    double rad = sc.nextDouble();
    obj.calculateArea(rad);
  }

}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ javac Overload.java
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java Overload

Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:02/06/2023


Enter the side of the square:
4
Area of the square: 16.0sq units

Enter sides of the rectangle:
6
7

Area of rectangle: 42.0sq units

Enter the radius of the circle:
3

Area of the circle: 28.259999999999998sq units
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$
```

2. Create a class 'Employee' with data members Empid, Name, Salary, Address and constructors to initialize the data members. Create another class 'Teacher' that inherit the properties of class employee and contain its own data members department, Subjects taught and constructors to initialize these data members and also include display function to display all the data members. Use array of objects to display details of N teachers.

CODE:

```
public class Employee{
public static void main(String[] args) {
    System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and Name: 20MCA132, Object Oriented Programming Lab\nDate:05/06/2023\n\n");
    Teacher teacObj[] = new Teacher[2];
    teacObj[0]=new Teacher("1","Denzel","Kuzhivelil house",50000,"MCA","DBMS");
    teacObj[1] = new Teacher("2","Ashin","Rose House",23000,"MCA","Computer Networks");
    teacObj[0].display();
     teacObj[1].display();
  }
}
class Employees {
  String Empid;
  String Name;
  String Address;
  int Salary;
  Employees(String id,String name,String addr,int salary){
      this.Empid = id;
      this.Name = name;
      this.Address = addr;
```

```
        this.Salary = salary;
    }
    void display(){
      System.out.println("EmpID : " + this.Empid);
      System.out.println("Name : " + this.Name);
      System.out.println("Address : " + this.Address);
      System.out.println("Salary : " + this.Salary);
    }
}
class Teacher extends Employees{
    String Department;
    String Subject;
    Teacher(String id,String name,String addr,int salary,String dept,String subj){
      super(id,name,addr,salary);
      this.Department=dept;
      this.Subject=subj;
}
void display(){
    System.out.println("********************************** ");
    super.display();
    System.out.println("Dept Name : " + this.Department);
    System.out.println("Subject Name : " + this.Subject);

}
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ javac Employee.java
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java Employee

Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:05/06/2023


**********************************
EmpID : 1
Name : Denzel
Address : Kuzhivelil house
Salary : 50000
Dept Name : MCA
Subject Name : DBMS
**********************************
EmpID : 2
Name : Ashin
Address : Rose House
Salary : 23000
Dept Name : MCA
Subject Name : Computer Networks
```

3. Create a class 'Person' with data members Name, Gender, Address, Age and a constructor to initialize the data members and another class 'Employee' that inherits the properties of class Person and also contains its own data members like Empid, Company_name, Qualification, Salary and its own constructor. Create another class 'Teacher' that inherits the properties of class Employee and contains its own data members like Subject, Department, Teacherid and also contain constructors and methods to display the data members. Use array of objects to display details of N teachers.

CODE:

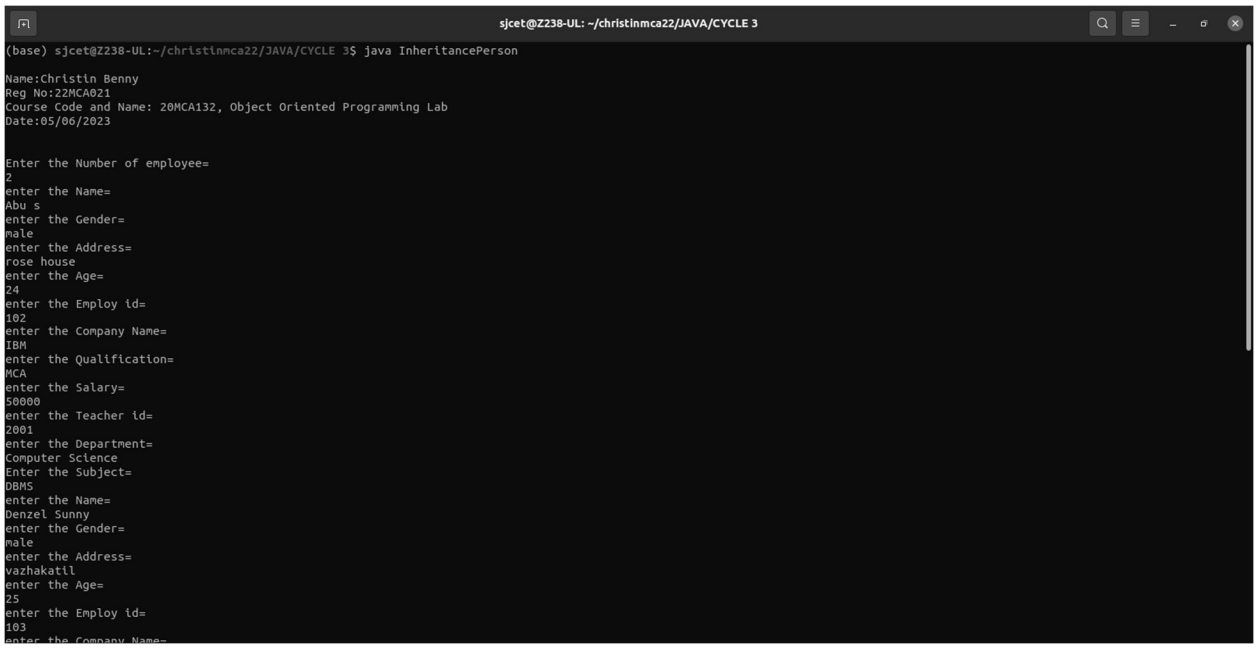
```
import java.util.*;
class Person{
  String Name;
  String Gender;
  String Address;
  String Age;
  public Person(String Name,String Gender,String Address,String Age){
    this.Name=Name;
    this.Gender=Gender;
    this.Address=Address;
    this.Age=Age;
  }
}
class Employee extends Person {
   String Empid;
   String Company_Name;
   String Qualification;
   String Salary;
   public Employee(String Name,String Gender,String Address,String Age ,String Empid,String Company_Name, String Qualification,String Salary){
```

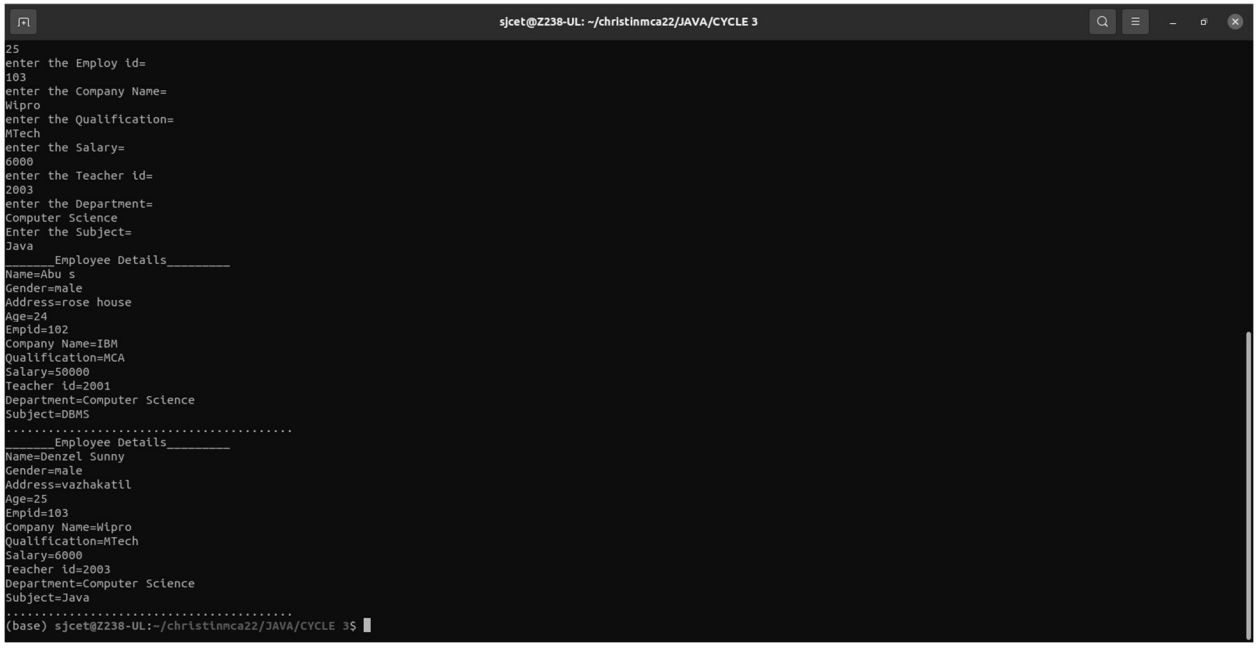
```
        super(Name,Gender,Address,Age);
        this.Empid= Empid;
        this.Company_Name=Company_Name;
        this.Qualification=Qualification;
        this.Salary=Salary;
      }
}
class Teacher extends Employee{
    String Teacherid;
    String Department;
    String Subject;
    public Teacher(String Name,String Gender,String Address,String Age,String Empid,String Company_Name,String Qualification,String Salary,String Teacherid,String Department,String Subject){
    super(Name,Gender,Address,Age,Empid,Name,Qualification, Salary);
    this.Teacherid=Teacherid;
    this.Department=Department;
    this.Subject=Subject;
    }
    public void read(){
    Scanner in =new Scanner(System.in);
    System.out.println("enter the Name=");
    Name=in.nextLine();
    System.out.println("enter the Gender=");
    Gender=in.nextLine();
    System.out.println("enter the Address=");
    Address=in.nextLine();
    System.out.println("enter the Age=");
    Age=in.nextLine();
    System.out.println("enter the Employ id=");
    Empid=in.nextLine();
```

```
    System.out.println("enter the Company Name=");
    Company_Name=in.nextLine();
    System.out.println("enter the Qualification=");
    Qualification=in.nextLine();
    System.out.println("enter the Salary=");
    Salary=in.nextLine();
    System.out.println("enter the Teacher id=");
    Teacherid=in.nextLine();
    System.out.println("enter the Department=");
    Department=in.nextLine();
    System.out.println("Enter the Subject=");
    Subject=in.nextLine();
    }
    public void display(){
    System.out.println("_______Employee Details_________");
    System.out.println("Name="+ Name);
    System.out.println("Gender=" + Gender);
    System.out.println("Address=" + Address);
    System.out.println("Age=" + Age);
    System.out.println("Empid=" + Empid);
    System.out.println("Company Name=" + Company_Name);
    System.out.println("Qualification=" + Qualification);
    System.out.println("Salary=" + Salary);
    System.out.println("Teacher id=" + Teacherid);
    System.out.println("Department=" + Department);
    System.out.println("Subject=" + Subject);
    System.out.println(".....");
    }
}
 class InheritancePerson{
   public static void main(String Args[]){
```

```
    System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and
Name: 20MCA132, Object Oriented Programming Lab\nDate:05/06/2023\n\n");
    int i,n;
    Scanner in =new Scanner(System.in);
    System.out.println("Enter the Number of employee=");
    n=in.nextInt();
    Teacher T[] = new Teacher[n];
    for(i=0;i<n;i++){
        T[i]=new

Teacher("Name","Gender","Address","Age","Empid","Name","Qualification","Salary","Te
acherid","Department","Subject");
        T[i].read();
    }
    for(i=0;i<n;i++){
       T[i].display();
    }
  }
}
```

OUTPUT:


sjcet@Z238-UL: ~/christinmca22/JAVA/CYCLE 3
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java InheritancePerson
Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:05/06/2023
Enter the Number of employee=
2
enter the Name=
Abu s
enter the Gender=
male
enter the Address=
rose house
enter the Age=
24
enter the Employ id=
102
enter the Company Name=
IBM
enter the Qualification=
MCA
enter the Salary=
50000
enter the Teacher id=
2001
enter the Department=
Computer Science
Enter the Subject=
DBMS
enter the Name=
Denzel Sunny
enter the Gender=
male
enter the Address=
vazhakatil
enter the Age=
25
enter the Employ id=
103


sjcet@Z238-UL: ~/christinmca22/JAVA/CYCLE 3
25
enter the Employ id=
103
enter the Company Name=
Wipro
enter the Qualification=
MTech
enter the Salary=
6000
enter the Teacher id=
2003
enter the Department=
Computer Science
Enter the Subject=
Java
_____Employee Details________
Name=Abu s
Gender=male
Address=rose house
Age=24
Empid=102
Company Name=IBM
Qualification=MCA
Salary=50000
Teacher id=2001
Department=Computer Science
Subject=DBMS
.....
_____Employee Details________
Name=Denzel Sunny
Gender=male
Address=vazhakatil
Age=25
Empid=103
Company Name=Wipro
Qualification=MTech
Salary=6000
Teacher id=2003
Department=Computer Science
Subject=Java
.....
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$

4. Write a program has class Publisher, Book, Literature and Fiction. Read the information and print the details of books from either the category, using inheritance.

CODE:

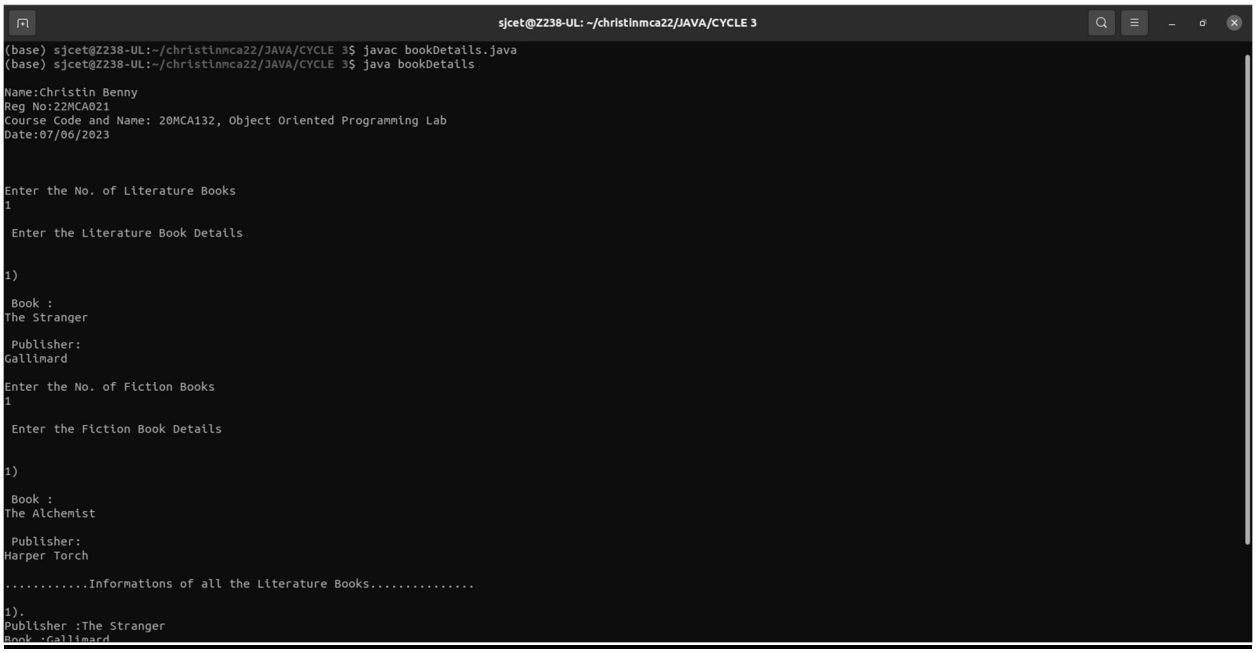
```
import java.util.Scanner;
class Publisher{
   String publisher;
   Publisher(String pub){
      this.publisher=pub;
   }
}
class Book extends Publisher{
   String book;
   Book(String pub,String boo){
      super(pub);
      book=boo;

   }
}
class Literature extends Book{
   String category;
   Literature(String pub, String boo){
      super(pub, boo);
   }
   void display(){
      System.out.println("Publisher :"+publisher);
      System.out.println("Book :"+book);
   }
}
```

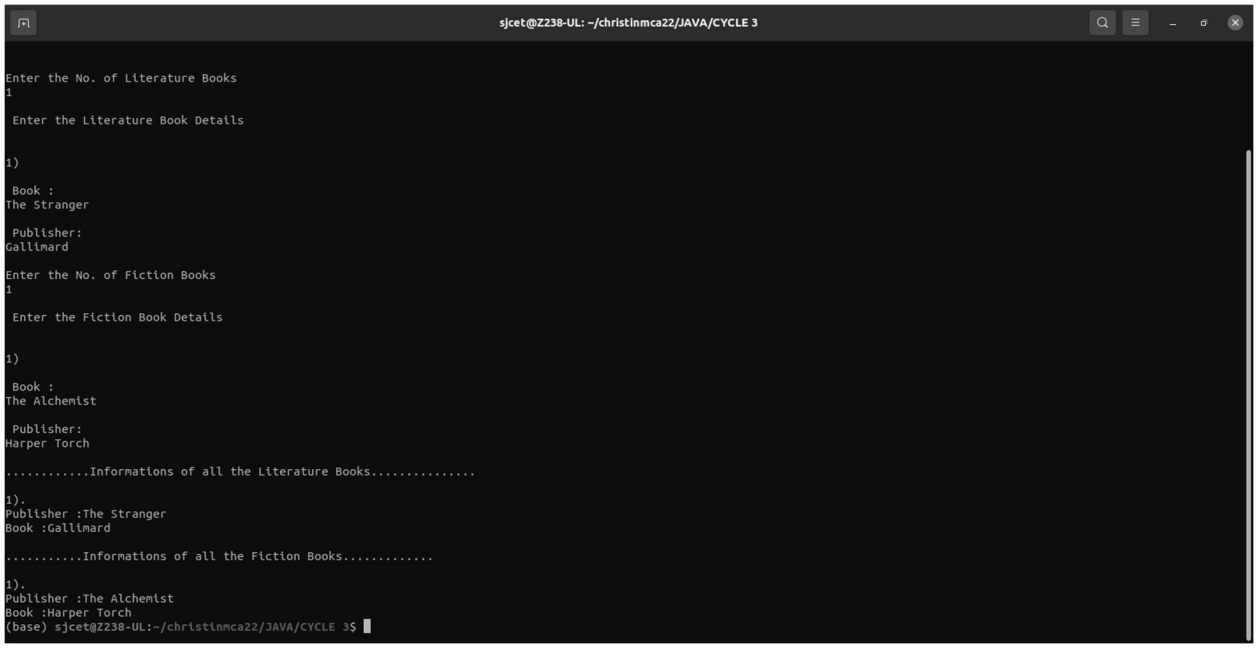
```
class Fiction extends Book{
    Fiction(String pub, String boo){
        super(pub, boo);
    }
    void display(){
        System.out.println("Publisher :"+publisher);
        System.out.println("Book :"+book);
    }
}
public class bookDetails{
    public static void main(String[] args) {
    System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and
Name: 20MCA132, Object Oriented Programming Lab\nDate:07/06/2023\n\n");
        System.out.println("\nEnter the No. of Literature Books");
        Scanner sc1 = new Scanner(System.in);
        int num = sc1.nextInt();
        Literature arr[]=new Literature[num];
        System.out.println("\n Enter the Literature Book Details\n");
        int x = 0,j=0;
        Scanner sc =new Scanner(System.in);
        for(int i =0;i<num;i++)
        {
            x = i +1;
            System.out.println("\n"+x+")");
            System.out.println("\n Book : ");
            String boo =sc.nextLine();
            System.out.println("\n Publisher: ");
            String pub =sc.nextLine();

            arr[i]=new Literature(boo,pub);
        }
```

```
System.out.println("\nEnter the No. of Fiction Books");
int num1 = sc1.nextInt();
Fiction arr1[]=new Fiction[num1];
System.out.println("\n Enter the Fiction Book Details\n");
int x1 = 0,j1=0;
for(int i =0;i<num1;i++)
{
   x1 = i +1;
   System.out.println("\n"+x1+")");
   System.out.println("\n Book : ");
   String boo =sc.nextLine();
   System.out.println("\n Publisher: ");
   String pub =sc.nextLine();

   arr1[i]=new Fiction(boo,pub);
}
sc.close();
sc1.close();

System.out.println("\n.....Informations of all the Literature Books.....");
for(int i=0;i<num;i++){
   j=i+1;
   System.out.println("\n"+j+").");
   arr[i].display();

}
System.out.println("\n.....Informations of all the Fiction Books.....");
for(int i=0;i<num1;i++){
   j1=i+1;
   System.out.println("\n"+j1+").");
   arr1[i].display();
```

```
    }
  sc1.close();
  }
 }
```

OUTPUT:




sjcet@Z238-UL: ~/christinmca22/JAVA/CYCLE 3
Enter the No. of Literature Books
1
Enter the Literature Book Details
1)
Book :
The Stranger
Publisher:
Gallimard
Enter the No. of Fiction Books
1
Enter the Fiction Book Details
1)
Book :
The Alchemist
Publisher:
Harper Torch
.....Informations of all the Literature Books.....
1).
Publisher :The Stranger
Book :Gallimard
.....Informations of all the Fiction Books.....
1).
Publisher :The Alchemist
Book :Harper Torch
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$

5. Create classes Student and Sports. Create another class Result inherited from Student and Sports. Display the academic and sports score of a student.

CODE:

```
import java.util.Scanner;
class sports{
    String sport;
    int Rating;
    sports(String spo, int ra){
        sport = spo;
        Rating = ra;
    }

}
class student extends sports{
    String Grade;
    double Overall_per;
    student(String spo, int ra,String gd, double per ){
        super(spo, ra);
        Grade = gd;
        Overall_per = per;
    }
}
public class result extends student {
    result(String spo, int ra,String gd, double per ){
        super(spo, ra, gd, per);
    }
    void display(){
        System.out.println("\nSports Details of Student");
        System.out.println("Sport :"+sport);
```

```
        System.out.println("Rating :"+Rating);
        System.out.println("\nAcademic Details of Student");
        System.out.println("Academic Grade :"+Grade);
        System.out.println("Overall percentage :"+Overall_per);
    }

    public static void main(String[] args) {
      System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and
Name: 20MCA132, Object Oriented Programming Lab\nDate:07/06/2023\n\n");
        Scanner sc =new Scanner(System.in);
        System.out.println("\nEnter the Sports Details of Student");
        System.out.println("\n Sport: ");
        String a =sc.next();
        System.out.println("\n Sport Rating  out of 10: ");
        int b =sc.nextInt();
        System.out.println("\nEnter the Sports Details of Student");
        System.out.println("\n Academic Grade: ");
        String c =sc.next();
        System.out.println("\n Overall percentage: ");
        double d =sc.nextDouble();
        sc.close();
        result obj= new result(a,b,c,d);
        obj.display();
    }
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ javac result.java
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java result

Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:07/06/2023



Enter the Sports Details of Student

 Sport:
Football

 Sport Rating  out of 10:
8

Enter the Sports Details of Student

 Academic Grade:
A

 Overall percentage:
89

Sports Details of Student
Sport :Football
Rating :8

Academic Details of Student
Academic Grade :A
Overall percentage :89.0
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$
```

6. Create an interface having prototypes of functions area() and perimeter(). Create two classes Circle and Rectangle which implements the above interface. Create a menu driven program to find area and perimeter of objects.

CODE:

```
import java.util.Scanner;

interface prop
{
   void getdata();
   void area();
   void perimeter();
}

class Circle implements prop
{
   double pi = 3.14;
   double r;
   Scanner sc = new Scanner(System.in);
   @Override
   public void getdata()
   {
      System.out.println("Enter the radius of the circle:");
      r = sc.nextDouble();
   }
   @Override
   public void perimeter()
   {
      System.out.println("Perimeter of the circle: "+(2*pi*r));
   }
```

```
    @Override
    public void area()
    {
        System.out.println("Area of the circle: "+(pi*r*r));
    }
}

class Rectangle implements prop
{
    double l,b;
    Scanner sc = new Scanner(System.in);
    @Override
    public void getdata()
    {
        System.out.println("Enter the length of the rectangle:");
        l = sc.nextDouble();
        System.out.println("Enter the breadth of the rectangle:");
        b = sc.nextDouble();
    }
    @Override
    public void area()
    {
        System.out.println("Area of a rectangle: "+(l*b));
    }
    @Override
    public void perimeter()
    {
        System.out.println("Perimeter of a rectangle: "+(2*(l+b)));
    }
}
```

```
public class Menudriven
{
   public static void main(String[] args)
   {
       System.out.println("\nName:Christin Benny\nReg No:22MCA021\nCourse Code and Name: 20MCA132, Object Oriented Programming Lab\nDate:07/06/2023\n\n");
      int ch;
      Scanner sc = new Scanner(System.in);
      Circle ob = new Circle();
      Rectangle obj = new Rectangle();
      do
      {
         System.out.println("\n1.Circle\n2.Rectangle\n3.exit");
         System.out.println("Enter your choice:");
         ch = sc.nextInt();
         switch(ch)
         {
            case 1 :ob.getdata();
                    ob.area();
                    ob.perimeter();
                    break;
            case 2 :obj.getdata();
                    obj.area();
                    obj.perimeter();
                    break;
            case 3 :System.out.println("Exited...");
                    System.exit(0);
         }
      }while(true);
   }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ javac Menudriven.java
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java Menudriven

Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:07/06/2023



1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
6
Area of the circle: 113.03999999999999
Perimeter of the circle: 37.68

1.Circle
2.Rectangle
3.exit
Enter your choice:
2
Enter the length of the rectangle:
5
Enter the breadth of the rectangle:
6
Area of a rectangle: 30.0
Perimeter of a rectangle: 22.0

1.Circle
2.Rectangle
3.exit
Enter your choice:
3
Exited...
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$
```

7. Prepare bill with the given format using calculate method from interface.

Order No.

Date :

Product Id	Name	Quantity	unit price	Total
101	A	2	25	50
102	B	1	100	100
			Net. Amount	150

CODE:

```
import java.util.Scanner;

interface calc
{
   void calculate();
}

class bill implements calc
{
   String date,name,p_id;
   int quantity;
   double unit_price,total,namount=0;
   Scanner sc = new Scanner(System.in);
   public void getdata()
   {
      System.out.println("\nEnter product id:");
      p_id = sc.nextLine();
      System.out.println("Enter product name:");
      name = sc.nextLine();
      System.out.println("Enter the Quantity:");
```

```
        quantity = sc.nextInt();
        System.out.println("Enter the unit price:");
        unit_price = sc.nextDouble();
    }

    @Override
    public void calculate()
    {
        total = quantity * unit_price;
    }
    public void display()
    {
        System.out.println(p_id+"\t\t"+name+"\t\t"+quantity+"\t\t"+unit_price+"\t"+total);
    }
}
public class Ebill
{
    public static void main(String[] args)
    {
          System.out.println("\nName:Christin  Benny\nReg  No:22MCA021\nCourse  Code
and Name: 20MCA132, Object Oriented Programming Lab\nDate:07/06/2023\n\n");
        int n,i;
        double namount=0,t;
        int ran;
        String date;
        t = Math.random() *1000000;
        ran = (int) t;
        Scanner sc = new Scanner(System.in);
        System.out.println("Order no. #"+ran);
        System.out.println("Enter the date:");
        date = sc.nextLine();
```

```
        System.out.println("Enter how many products are there:");
        n = sc.nextInt();
        bill ob[] = new bill[n];
        for(i=0;i<n;i++)
            ob[i] = new bill();
        for(i=0;i<n;i++){
            ob[i].getdata();
            ob[i].calculate();
        }
        System.out.println("Date:"+date);
        System.out.println("Product Id \tName\t   Quantity\t   unit price\t Total ");
        System.out.println("-----------------------------------------------------------");
        for(i=0;i<n;i++){
            ob[i].display();
            namount += ob[i].total;
        }
        System.out.println("-----------------------------------------------------------");
        System.out.println("\t\t\tNet.Amount\t"+ namount);

    }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ javac Ebill.java
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$ java Ebill

Name:Christin Benny
Reg No:22MCA021
Course Code and Name: 20MCA132, Object Oriented Programming Lab
Date:07/06/2023


Order no. #252084
Enter the date:
05/06/2023
Enter how many products are there:
2

Enter product id:
101
Enter product name:
A
Enter the Quantity:
2
Enter the unit price:
25

Enter product id:
102
Enter product name:
B
Enter the Quantity:
1
Enter the unit price:
100
Date:05/06/2023
Product Id      Name       Quantity        unit price    Total
---------------------------------------------------------------
101             A               2               25.0    50.0
102             B               1               100.0   100.0
---------------------------------------------------------------
                      Net.Amount      150.0
(base) sjcet@Z238-UL:~/christinmca22/JAVA/CYCLE 3$
```