LAB CYCLE - 3

1. Area of different shapes using overloaded functions

CODE

```
class Area{
        int shape(int l,int b){
                return l*b;
        }
        double shape(double l,double b){
                return(0.5*l*b);
        }
        double shape(double l){
                return(3.14*l*l);
        }
}

public class MainArea{
        public static void main(String args[]){
                System.out.println("Anjala Michael\n22mca007\nOOPS
LAB\n20MCA132\nDate:08-06-2023");
                Area A=new Area();
                System.out.println("Area of Rectangle = "+A.shape(4,5));
                System.out.println("Area of Triangle = "+A.shape(6,5));
                System.out.println("Area of Circle = "+A.shape(5));
        }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac MainArea.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java MainArea
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:08-06-2023
Area of Rectangle = 20
Area of Triangle = 30
Area of Circle = 78.5
```

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

CODE

```
public class Employee{
        public static void main(String[] args){
                System.out.println("Anjala Michael\n22mca007\nOOPS
LAB\n20MCA132\nDate:14-06-2023");
                System.out.println(" .......................................");
                Teacher teacObj[] = new Teacher[2];
                teacObj[0]=new
Teacher("1","Rosmin","Machiyaniyil",65000,"Physics","Thermodynamics");
                teacObj[1] = new Teacher("2","Sheenu","Kadaplackal",45000,"Computer
Science","Java Programming");
                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(){
                super.display();
                System.out.println("Dept Name : " + this.Department);
                System.out.println("Subject Name : " + this.Subject);
                System.out.println(" .......................................");
        }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac Employee.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java Employee
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:14-06-2023
 .......................................
EmpID : 1
Name : Rosmin
Address : Machiyaniyil
Salary : 65000
Dept Name : Physics
Subject Name : Thermodynamics
 .......................................
EmpID : 2
Name : Sheenu
Address : Kadaplackal
Salary : 45000
Dept Name : Computer Science
Subject Name : Java Programming
 .......................................
```

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, Teacher_id and also contains constructors and methods to display the data members. Use an array of objects to display details of N teachers.

CODE

```java
import java.util.Scanner;
class person {
        String Name;
    String Gender;
    String Address;
    int Age;
    person(String name,String gender,String address, int age){
            this.Name = name;
        this.Gender = gender;
        this.Address = address;
        this.Age = age;
    }
}

class Employee extends person{
        int Empid;
        String Company_name;
        String Qualification;
        long Salary;
        Employee(String name,String gender,String address, int age,int empid, String
company_name, String qualification,long salary){
                super(name,gender,address,age);
            this.Empid= empid;
            this.Company_name=company_name;
            this.Qualification=qualification;
            this.Salary=salary;
        }
}

public class Teacher extends Employee{
    String Subject;
```

```java
    String Department;
    String Teacherid;
    Teacher(String name,String gender,String address, int age,int empid, String company_name,
String qualification,long salary, String subject, String department, String teacherid){
        super(name,gender,address,age,empid,company_name,qualification,salary);
        this.Subject=subject;
        this.Department=department;
        this.Teacherid=teacherid;
            }

    void display(){
        System.out.println("Name: "+Name);
        System.out.println("Gender: "+Gender);
        System.out.println("Address: "+Address);
        System.out.println("Age: "+Age);
        System.out.println("Employee id: "+Empid);
        System.out.println("Company Name: "+Company_name);
        System.out.println("Qualification: "+Qualification);
        System.out.println("Salary: "+Salary);
        System.out.println("Subject: "+Subject);
        System.out.println("Department: "+Department);
        System.out.println("Teacher id: "+Teacherid);

    }
    public static void main(String[] args) {
        System.out.println("Anjala Michael\n22mca007\nOOPS LAB\n20MCA132\nDate:14-06-
2023");
        System.out.println("\nEnter the No. of Teacher's");
        Scanner sc1 = new Scanner(System.in);
        int num = sc1.nextInt();
        Teacher arr[]=new Teacher[num];
        System.out.println("\n Enter the Teacher Details");
        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("Name: ");
            String a =sc.next();
```

```java
        System.out.println("Gender: ");
        String b =sc.next();
        System.out.println("Address: ");
        String c =sc.next();
        System.out.println("Age: ");
        int d =sc.nextInt();
        System.out.println("Employee id: ");
        int e =sc.nextInt();
        System.out.println("Company name: ");
        String f =sc.next();
        System.out.println("Qualification: ");
        String g =sc.next();
        System.out.println("Salary: ");
        long h =sc.nextLong();
        System.out.println("Subject: ");
        String k =sc.next();
        System.out.println("Department: ");
        String l =sc.next();
        System.out.println("Teacher Id: ");
        String n =sc.next();
        arr[i]=new Teacher(a,b,c,d,e,f,g,h,k,l,n);
      }
    sc.close();
    System.out.println("\n***Informations of all the Teacher's***");
    for(int i=0;i<num;i++){
        j=i+1;
        System.out.println("\n"+j+")");
        arr[i].display();

  }
  sc1.close();
  }

}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac Teacher.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java Teacher
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:14-06-2023

Enter the No. of Teacher's
1

 Enter the Teacher Details

1)
Name:
Sheenu
Gender:
Female
Address:
Pathiyil,Elanji
Age:
35
Employee id:
111
Company name:
sgc
Qualification:
MTech
Salary:
45000
Subject:
CFDP
Department:
Computer applications
Teacher Id:

***Informations of all the Teacher's***

1)
Name: Sheenu
Gender: Female
Address: Pathiyil,Elanji
Age: 35
Employee id: 111
Company Name: sgc
Qualification: MTech
Salary: 45000
Subject: CFDP
Department: Computer
Teacher id: applications
```

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

```java
import java.util.Scanner;
class Publisher{
        int publisher_id;
        String publisher_name;
        Publisher(int publisher_id, String publisher_name){
                this.publisher_id= publisher_id;
                this.publisher_name= publisher_name;
        }
}

class Book extends Publisher{
        int book_id;
        String book_name;
        Book(int publisher_id, String publisher_name, int book_id, String book_name){
                super(publisher_id, publisher_name);
                this.book_id= book_id;
                this.book_name= book_name;
        }
}

class Literature extends Book{
        int literature_id;
        String literature_theme;
        Literature(int publisher_id, String publisher_name, int book_id, String
book_name, int literature_id, String literature_theme){
                super(publisher_id, publisher_name, book_id, book_name);
                this.literature_id= literature_id;
                this.literature_theme= literature_theme;
        }
        void displayDetails(){
                System.out.println("The publisher ID of the book is: " + this.publisher_id);
                System.out.println("The publisher name of the book is: " +
this.publisher_name);
                System.out.println("The Book ID of the book is: " + this.book_id);
                System.out.println("The Book name of the book is: " + this.book_name);
```

```java
                System.out.println("The Literature ID of the book is: " +
this.literature_id);
                System.out.println("The Literature theme of the book is: " +
this.literature_theme);
        }
}

class Fiction extends Book{
        int fiction_id;
        String fiction_theme;
        Fiction(int publisher_id, String publisher_name, int book_id, String book_name,
int fiction_id, String fiction_theme){
                super(publisher_id, publisher_name, book_id, book_name);
                this.fiction_id= fiction_id;
                this.fiction_theme= fiction_theme;
        }
        void displayDetails(){
                System.out.println("The publisher ID of the book is: " + this.publisher_id);
                System.out.println("The publisher name of the book is: " +
this.publisher_name);
                System.out.println("The Book ID of the book is: " + this.book_id);
                System.out.println("The Book name of the book is: " + this.book_name);
                System.out.println("The Fiction ID of the book is: " + this.fiction_id);
                System.out.println("The Fiction theme of the book is: " +
this.fiction_theme);
        }
}
public class BookShelf {
        public static void main(String[] args) {
                System.out.println("Anjala Michael\n22mca007\nOOPS
LAB\n20MCA132\nDate:08-06-2023");
                Literature literature= new Literature(10,"Robert Kiyozaki",200,"Rich Dad
Poor Dad",2001,"Drama");
                Fiction fiction= new Fiction(101, "F. Scott Fitzgerald", 301, "The Great
Gatsby",301, "Fantasy-Fiction");
                literature.displayDetails();
                System.out.println("\n");
                fiction.displayDetails();
        }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac BookShelf.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java BookShelf
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:08-06-2023
The publisher ID of the book is: 10
The publisher name of the book is: Robert Kiyozaki
The Book ID of the book is: 200
The Book name of the book is: Rich Dad Poor Dad
The Literature ID of the book is: 2001
The Literature theme of the book is: Drama


The publisher ID of the book is: 101
The publisher name of the book is: F. Scott Fitzgerald
The Book ID of the book is: 301
The Book name of the book is: The Great Gatsby
The Fiction ID of the book is: 301
The Fiction theme of the book is: Fantasy-Fiction
```

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

```java
import java.util.Scanner;
class student{
        int roll;
        String name;
        int phy,eng,maths;
        student(){
                Scanner sc1= new Scanner(System.in);
                System.out.println("Enter the roll number:");
                roll =sc1.nextInt();
                System.out.println("Enter name:");
                name=sc1.next();
                System.out.println("Enter physics mark:");
                phy =sc1.nextInt();
                System.out.println("Enter english mark:");
                eng =sc1.nextInt();
                System.out.println("Enter maths mark:");
                maths =sc1.nextInt();
        }
}
class sports extends student{
        int fscore,cscore;
        sports(){
                Scanner sc2= new Scanner(System.in);
                System.out.println("Enter football score:");
                fscore=sc2.nextInt();
                System.out.println("Enter Cricket score:");
                cscore=sc2.nextInt();
        }
}
class Result extends sports{
        void display(){
                System.out.println("Academic Details"+"\n"+" ");
                System.out.println("Name : " + name);
                System.out.println("Roll No : " + roll);
                System.out.println("");
                System.out.println("MARKS" +"\n" + " ");
```

```java
                System.out.println("Physics :" + phy);
                System.out.println("English :" + eng);
                System.out.println("Maths :" + maths);
                System.out.println("Total subject mark:"+(phy+eng+maths));
                System.out.println("");
                System.out.println("SPORTS SCORE" +"\n"+" ");
                System.out.println("Football : " + fscore);
                System.out.println("Cricket : " + cscore);
                System.out.println("Total Sports mark:"+(fscore+cscore));
        }
}
public class FResult{
        public static void main(String[] args){
                System.out.println("Anjala Michael\n22mca007\nOOPS
LAB\n20MCA132\nDate:15-06-2023");
                Result rs =new Result();
                rs.display();
        }
}
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac FResult.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java FResult
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:15-06-2023
Enter the roll number:
10
Enter name:
antony
Enter physics mark:
55
Enter english mark:
67
Enter maths mark:
40
Enter football score:
75
Enter Cricket score:
69
Academic Details

Name : antony
Roll No : 10

MARKS

Physics :55
English :67
Maths :40
Total subject mark:162

SPORTS SCORE

Football : 75
Cricket : 69
Total Sports mark:144
```

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

CODE

```java
import java.util.*;
import java.lang.*;
interface Shape {
        float pi = 3.14F;
        float area();
        float perimeter();
}
class Circle implements Shape{
        Scanner sc = new Scanner(System.in);
        int r;
        public float area(){
                System.out.print("Enter the radius : ");
                r = Integer.parseInt(sc.nextLine());
                return (pi * r * r);
        }
        public float perimeter() {
                System.out.print("Enter the radius : ");
                r = Integer.parseInt(sc.nextLine());
                return (2 * pi * r);
        }
}
class Rectangle implements Shape{
        Scanner sc = new Scanner(System.in);
        int l, b;
        public float area(){
                System.out.print("Enter the Length : ");
                l = Integer.parseInt(sc.nextLine());
                System.out.print("Enter the breadth : ");
                b = Integer.parseInt(sc.nextLine());
                return (l * b);
        }
        public float perimeter(){
                System.out.print("Enter the Length : ");
                l = Integer.parseInt(sc.nextLine());
                System.out.print("Enter the breadth : ");
                b = Integer.parseInt(sc.nextLine());
```

```java
                    return (2 * (l + b));
            }
    }
    class ShapeInterface{
            public static void main(String args[]) {
                    System.out.println("Anjala Michael\n22mca007\nOOPS
    LAB\n20MCA132\nDate:16-06-2023");
                    Scanner sc = new Scanner(System.in);
                    Circle c = new Circle();
                    Rectangle r = new Rectangle();
                    int ch;
                    while (true) {
                            System.out.println("1:Area of Circle");
                            System.out.println("2:Perimeter of Circle");
                            System.out.println("3:Area of Rectangle");
                            System.out.println("4:Perimter of Rectangle");
                            System.out.println("5:EXIT");
                            System.out.print("Enter choice : ");
                            ch = Integer.parseInt(sc.nextLine());
                            switch (ch) {
                                    case 1:
                                            float ar = c.area();
                                            System.out.println("Area :" + ar);
                                            System.out.println("**-----------**--------- **");
                                            break;
                                    case 2:
                                            float pr = c.perimeter();
                                            System.out.println("Perimeter of Circle = "+pr);
                                            System.out.println("**-----------**--------- **");
                                            break;
                                    case 3:
                                            float a = r.area();
                                            System.out.println("Area :" + a);
                                            System.out.println("**-----------**--------- **");
                                            break;
                                    case 4:
                                            float pr1 = r.perimeter();
                                    System.out.println("Perimeter of Rectangle = "+pr1);
                                            System.out.println("**-----------**--------- **");
                                            break;
```

```
                                    case 5:
                                            System.out.println("Exiting the Program!!!!!");
                                            System.exit(0);
                                    default:
                                            System.out.println("invalid!");
                            }
                    }
                    }
            }
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac ShapeInterface.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java ShapeInterface
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:16-06-2023
1:Area of Circle
2:Perimeter of Circle
3:Area of Rectangle
4:Perimter of Rectangle
5:EXIT
Enter choice : 1
Enter the radius : 5
Area :78.5
**..........**.......... **
1:Area of Circle
2:Perimeter of Circle
3:Area of Rectangle
4:Perimter of Rectangle
5:EXIT
Enter choice : 2
Enter the radius : 5
Perimeter of Circle = 31.400002
**..........**.......... **
1:Area of Circle
2:Perimeter of Circle
3:Area of Rectangle
4:Perimter of Rectangle
5:EXIT
Enter choice : 3
Enter the Length : 4
Enter the breadth : 5
Area :20.0
**..........**.......... **
1:Area of Circle
2:Perimeter of Circle
3:Area of Rectangle
4:Perimter of Rectangle
5:EXIT
Enter choice : 4
Enter the Length : 4
Enter the breadth : 5
Perimeter of Rectangle = 18.0
**..........**.......... **
1:Area of Circle
2:Perimeter of Circle
3:Area of Rectangle
4:Perimter of Rectangle
5:EXIT
Enter choice : 5
Exiting the Program!!!!!
```

7. Prepare a bill with the given format using the calculate method from the 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.text.SimpleDateFormat;
import java.util.Date;
interface bill{
        void cal();
}
class details1 implements bill{
        int pid=101,q=2,uprice=25,t1;
        String name1="A";
        public void cal(){
                t1=q*uprice;
        }
}
class details2 extends details1 {
        int pid2=102,q2=1,uprice2=100,t2;
        String name2="B";
        SimpleDateFormat f=new SimpleDateFormat("dd/MM/yy");
        Date d= new Date();
        public void cal(){
                super.cal();
                t2=q2*uprice2;
```

```
                }
        public void display(){
                System.out.println("Order No.384\n");
                System.out.println("Date: "+f.format(d));
                System.out.println("\nProduct Id\tName\t\tQuantity\tunit price\tTotal");
                System.out.println(" ");
                System.out.println(pid+"\t\t"+name1+"\t\t"+q+"\t\t"+uprice+"\t\t"+t1);
                System.out.println(pid2+"\t\t"+name2+"\t\t"+q2+"\t\t"+uprice2+"\t\t"+t2);
                System.out.println(" ");
                System.out.println("\t\t\t\tNet.Amount"+"\t\t"+(t1+t2));
        }
    }
    public class Electricitybill{
        public static void main(String[] args){
                System.out.println("Anjala Michael\n22mca007\nOOPS
        LAB\n20MCA132\nDate:16-06-2023");
                details2 obj2=new details2();
                obj2.cal();
                obj2.display();
        }
    }
```

OUTPUT

```
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ javac Electricitybill.java
(base) sjcet@Z238-UL:~/anjala007/sem 2/java/cycle 3$ java Electricitybill
Anjala Michael
22mca007
OOPS LAB
20MCA132
Date:16-06-2023
Order No.384

Date: 16/06/23

Product Id        Name                  Quantity        unit price        Total

101               A                     2               25                50
102               B                     1               100               100

                                        Net.Amount        _               150
```