CYCLE-3

1. Area of different shapes using overloaded functions .

CODE:

```java
import java.util.Scanner;
public class Shapes {
    void area(int r1)
    {
        double Area_val = 3.14*r1*r1;
        System.out.println("\nArea of Circle is Radius "+r1+" = "+Area_val);
    }
    void area(int a1,int b1){
        int Area_val = a1*b1;
        System.out.println("\nArea of Rectangle is with dimensions "+a1+" X "+b1+" =
"+Area_val);
    }
    void area(int a1,int b1,int c1){
        int Area_val = a1*b1*c1;
        System.out.println("\nArea of Cuboid is with dimensions "+a1+" X "+b1+" X "+c1+" =
"+Area_val);
    }
    public static void main(String[] args) {
        System.out.println("Name : Anna Jose");
        System.out.println("Register Number : SJC22MCA-2008");
        System.out.println("Course Name : Object Oriented Programming Lab");
        System.out.println("Course Code : 20MCA132");
        System.out.println("Date : 14/06/2023");
        Scanner sc = new Scanner(System.in);
        System.out.println("\nEnter the Length");
        int l = sc.nextInt();
        System.out.println("Enter the Breath");
        int b = sc.nextInt();
        System.out.println("Enter the Height");
        int h = sc.nextInt();
        System.out.println("Enter the Radius");
        int r = sc.nextInt();
        Shapes obj1 = new Shapes();
        obj1.area(r);
```

```
        obj1.area(l,b);
        obj1.area(l,b,h);
    }
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ javac Shapes.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java Shapes
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Enter the Length
23
Enter the Breath
2
Enter the Height
1
Enter the Radius
2

Area of Circle is Radius 2 = 12.56

Area of Rectangle is with dimensions 23 X 2 = 46

Area of Cuboid is with dimensions 23 X 2 X 1 = 46
```

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:

```java
import java.util.Scanner;
 class Employee {
   int Empid;
   String Name;
   double Salary;
   String Address;
   Employee(int no, String na, double sal, String add) {
     this.Empid = no;
     this.Name = na;
     this.Salary = sal;
     this.Address = add;
   }
}
public class Teacher extends Employee{
 String dept;
 String subject;

 Teacher(int no, String na, double sal, String add, String dep, String sub){
   super(no,na,sal,add);
   this.dept= dep;
   this.subject=sub;
 }

 void display(){
   System.out.println("Employee id: "+Empid);
   System.out.println("Name: "+Name);
   System.out.println("Salary: "+Salary);
   System.out.println("Address: "+Address);
   System.out.println("Department: "+dept);
   System.out.println("Subject: "+subject);
 }
 public static void main(String[] args) {
```

```java
        System.out.println("Name : Anna Jose");
        System.out.println("Register Number : SJC22MCA-2008");
        System.out.println("Course Name : Object Oriented Programming Lab");
        System.out.println("Course Code : 20MCA132");
        System.out.println("Date : 14/06/2023");
        System.out.println("\nEnter the No. of Employee's");
        Scanner sc1 = new Scanner(System.in);
        int num = sc1.nextInt();
        Teacher arr[]=new Teacher[num];
        for(int i =0;i<num;i++)
        {
            Scanner sc =new Scanner(System.in);
            System.out.println("\nEnter Employee id: ");
            int Empid=sc.nextInt();
            System.out.println("\nEnter Employee Name: ");
            String Name=sc.next();
            System.out.println("\nEnter Salary: ");
            double Salary=sc.nextDouble();
            System.out.println("\nEnter Address: ");
            String Address=sc.next();
            System.out.println("\nEnter department: ");
            String dept=sc.next();
            System.out.println("\nEnter Subject: ");
            String subject=sc.next();
            arr[i]=new Teacher(Empid,Name,Salary,Address,dept,subject);


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

}
sc1.close();
}


}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ javac Teacher.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java Teacher
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Enter the No. of Employee's
3

Enter Employee id:
001

Enter Employee Name:
Anna

Enter Salary:
50000

Enter Address:
Poonjar

Enter department:
Science

Enter Subject:
Biology

Enter Employee id:
002

Enter Employee Name:
Jude

Enter Salary:
60000

Enter Address:
Kochi

Enter department:
Commerce

Enter Subject:
Economics

Enter Employee id:
003

Enter Employee Name:
Joann

Enter Salary:
70000

Enter Address:
Kottayam

Enter department:
Language

Enter Subject:
English
```

```
********Informations of all the employee's************

1).
Employee id: 1
Name: Anna
Salary: 50000.0
Address: Poonjar
Department: Science
Subject: Biology

2).
Employee id: 2
Name: Jude
Salary: 60000.0
Address: Kochi
Department: Commerce
Subject: Economics

3).
Employee id: 3
Name: Joann
Salary: 70000.0
Address: Kottayam
Department: Language
Subject: English
```

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:

```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;
```

```java
  }
}

 public class Teacher2 extends Employee{
    String Subject;
    String Department;
    String Teacherid;
   Teacher2(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("Name : Anna Jose");
   System.out.println("Register Number : SJC22MCA-2008");
   System.out.println("Course Name : Object Oriented Programming Lab");
   System.out.println("Course Code : 20MCA132");
   System.out.println("Date : 14/06/2023");
     System.out.println("\nEnter the No. of Teacher's");
     Scanner sc1 = new Scanner(System.in);
     int num = sc1.nextInt();
     Teacher2 arr[]=new Teacher2[num];
```

```java
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();
    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 Teacher2(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:~/anna08/S2/java/co3$ javac Teacher2.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java Teacher2
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Enter the No. of Teacher's
2

 Enter the Teacher Details

1)
Name:
Anna
Gender:
Female
Address:
Poonjar
Age:
25
Employee id:
001
Company name:
Google
Qualification:
MCA
Salary:
6000000
Subject:
Computer Science
Department:
Teacher Id:
001


2)
Name: Jobin
Gender: Male
Address: Poonjar
Age: 25
Employee id: 2
Company Name: Google
Qualification: MCA
Salary: 12000000
Subject: Computer
Department: Science
Teacher id: 002
```

```
2)
Name:
Jobin
Gender:
Male
Address:
Poonjar
Age:
25
Employee id:
002
Company name:
Google
Qualification:
MCA
Salary:
12000000
Subject:
Computer Science
Department:
Teacher Id:
002

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

1)
Name: Anna
Gender: Female
Address: Poonjar
Age: 25
Employee id: 1
Company Name: Google
Qualification: MCA
Salary: 6000000
Subject: Computer
Department: Science
Teacher id: 001
```

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{
    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);
    }
}
```

```java
public class bookDetails{
   public static void main(String[] args) {
     System.out.println("Name : Anna Jose");
     System.out.println("Register Number : SJC22MCA-2008");
     System.out.println("Course Name : Object Oriented Programming Lab");
     System.out.println("Course Code : 20MCA132");
     System.out.println("Date : 14/06/2023");
     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.next();
        System.out.println("\n Publisher: ");
        String pub =sc.next();

        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.next();
        System.out.println("\n Publisher: ");
        String pub =sc.next();

        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:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ javac bookDetails.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java bookDetails
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Enter the No. of Literature Books
2

 Enter the Literature Book Details


1).

 Book :
ToKillAMockingbird

 Publisher:
HarperLee

2).

 Book :
PrideAndPrejudice

 Publisher:
JaneAusten

Enter the No. of Fiction Books
2

 Enter the Fiction Book Details


1).

 Book :
Beloved

 Publisher:
ToniMorrison
```

```
2).

 Book :
Dune

 Publisher:
FrankHerbert

***Informations of all the Literature Books***

1)
Publisher :ToKillAMockingbird
Book :HarperLee

2)
Publisher :PrideAndPrejudice
Book :JaneAusten

***Informations of all the Fiction Books***

1)
Publisher :Beloved
Book :ToniMorrison

2)
Publisher :Dune
Book :FrankHerbert
```

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 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("Name : Anna Jose");
        System.out.println("Register Number : SJC22MCA-2008");
```

```
            System.out.println("Course Name : Object Oriented Programming Lab");
            System.out.println("Course Code : 20MCA132");
            System.out.println("Date : 14/06/2023");
                    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:~/anna08/S2/java/co3$ javac result.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java result
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Enter the Sports Details of Student

 Sport:
cricket

 Sport Rating  out of 10:
9

Enter the Sports Details of Student

 Academic Grade:
A+

 Overall percentage:
93

Sports Details of Student
Sport :cricket
Rating :9

Academic Details of Student
Academic Grade :A+
Overall percentage :93.0                    _
```

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:

```java
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
{
```

```java
      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("Perimeter of a rectangle: "+(l*b));
      }
      @Override
      public void perimeter()
      {
        System.out.println("Area of a rectangle: "+(2*(l+b)));
      }
}

public class Areaperi
{
    public static void main(String[] args)
    {
        System.out.println("Name : Anna Jose");
        System.out.println("Register Number : SJC22MCA-2008");
        System.out.println("Course Name : Object Oriented Programming Lab");
        System.out.println("Course Code : 20MCA132");
        System.out.println("Date : 14/06/2023");
        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:~/anna08/S2/java/co3$ javac Areaperi.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java Areaperi
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
22
Area of the circle: 1519.76
Perimeter of the circle: 138.16

1.Circle
2.Rectangle
3.exit
Enter your choice:
2
Enter the length of the rectangle:
1
Enter the breadth of the rectangle:
2
Perimeter of a rectangle: 2.0
Area of a rectangle: 6.0

1.Circle
2.Rectangle
3.exit
Enter your choice:
3
Exited...
```

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                  25.0      50.0
102               B               1                 100.0      100.0
-------------------------------------------------------------------
                              Net.Amount        150.0
```

CODE:

```java
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()
    {
```

```java
      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 bills
{
   public static void main(String[] args)
   {
      System.out.println("Name : Anna Jose");
      System.out.println("Register Number : SJC22MCA-2008");
      System.out.println("Course Name : Object Oriented Programming Lab");
      System.out.println("Course Code : 20MCA132");
      System.out.println("Date : 14/06/2023");
      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("\nOrder 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:~/anna08/S2/java/co3$ javac bills.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co3$ java bills
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 14/06/2023

Order no. #335468
Enter the date:
08/08/2022
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:08/08/2022
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
```