CYCLE 3

1. Area of different shapes using overloaded functions

CODE:-

```
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("course_name:OOP LAB");
System.out.println("Course_code:20MCA132");
System.out.println("  Name     : Aparna Jayakumar");
System.out.println("Register_no: SJC22MCA-2012");
System.out.println("Date       :06/06/2023");
 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();
bj1.area(r);
obj1.area(l,b);
obj1.area(l,b,h);
}
}
```

OUTPUT:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Shapes.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Shapes
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :06/06/2023

Enter the Length
2
Enter the Breath
4
Enter the Height
3
Enter the Radius
2

Area of Circle is Radius 2 = 12.56

Area of Rectangle is with dimensions 2 X 4 = 8

Area of Cuboid is with dimensions 2 X 4 X 3 = 24
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$
```

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 contain 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:-

```
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) {
        System.out.println("course_name:OOP LAB");
        System.out.println("Course_code:20MCA132");
        System.out.println("  Name     : Aparna Jayakumar");
        System.out.println("Register_no: SJC22MCA-2012");
        System.out.println("Date       :05/06/2023");
    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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Teacher.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Teacher
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :05/06/2023

Enter the No. of Employee's
1

Enter Employee id:
1001

Enter Employee Name:
Aparna

Enter Salary:
12500

Enter Address:
abcd(h)

Enter department:
MCA

Enter Subject:
Java

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

1).
Employee id: 1001
Name: Aparna
Salary: 12500.0
Address: abcd(h)
Department: MCA
Subject: Java
```

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:-

```
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 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("course_name:OOP LAB");
       System.out.println("Course_code:20MCA132");
       System.out.println("  Name     : Aparna Jayakumar");
       System.out.println("Register_no: SJC22MCA-2012");
```

```
System.out.println("Date       :06/06/2023");
System.out.println("\nEnter the No. of Teacher's");
Scanner sc1 = new Scanner(System.in);
int num = sc1.nextInt();
Teacher2 arr[]=new Teacher2[num];
System.out.println("\n Enter the Teacher 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 Name: ");
   String a =sc.next();
   System.out.println("\n Gender: ");
   String b =sc.next();
   System.out.println("\n Address: ");
   String c =sc.next();
   System.out.println("\n Age: ");
   int d =sc.nextInt();
   System.out.println("\n Employee id: ");
   int e =sc.nextInt();
   System.out.println("\n Company name: ");
   String f =sc.next();
   System.out.println("\n Qualification: ");
   String g =sc.next();
   System.out.println("\n Salary: ");
   long h =sc.nextLong();
   System.out.println("\n Subject: ");
   String k =sc.next();
   System.out.println("\n Department: ");
   String l =sc.next();
   System.out.println("\n 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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Teacher2.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Teacher2
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :06/06/2023

Enter the No. of Teacher's
1

 Enter the Teacher Details

1).
 Name: Ammu
Gender: female
 Address: abcd(h)
 Age: 34
Employee id: 1245
Company name: SJCETPALAI
Qualification: MCA
Salary: 12590
 Subject: Java
Department: AI
 Teacher Id: 1235

********Informations of all the Teacher's************
1).
Name: Ammu
Gender: female
Address: abcd(h)
Age: 34
Employee id: 1245
Company Name: SJCETPALAI
Qualification: MCA
Salary: 12590
Subject: Java
Department: AI
Teacher id: 1235
```

4. Writing 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("course_name:OOP LAB");
System.out.println("Course_code:20MCA132");
System.out.println("  Name     : Aparna Jayakumar");
System.out.println("Register_no: SJC22MCA-2012");
 System.out.println("Date       :06/06/2023");
 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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac bookDetails.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java bookDetails
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :06/06/2023

Enter the No. of Literature Books
1

 Enter the Literature Book Details

1). Book : ActsOfLoveAndWar
Publisher: maggiebookes
Enter the No. of Fiction Books1
 Enter the Fiction Book Details
1). Book :
cog
Publisher:
harperKids

********Informations of all the Literature Books************
1).
Publisher :ActsOfLoveAndWar
Book :maggiebookes

********Informations of all the Fiction Books************
1).
Publisher :cog
Book :harperKids
```

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("course_name:OOP LAB");
        System.out.println("Course_code:20MCA132");
        System.out.println("  Name     : Aparna Jayakumar");
        System.out.println("Register_no: SJC22MCA-2012");
        System.out.println("Date       :07/06/2023");
        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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Result.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Result
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :07/06/2023

 Enter the Sports Details of Student...........
Sport: tennies
Sport Rating  out of 10: 8

Enter the Sports Details of Student
Academic Grade: A
Overall percentage: 89

 Sports Details of Student
Sport :tennies
Rating :8

 Academic Details of Student
Academic Grade :A
Overall percentage :89.0
```

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:-

```
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);
     public void getdata()
   {
      System.out.println("Enter the radius of the circle:");
      r = sc.nextDouble();
   }
   public void perimeter()
   {
      System.out.println("Perimeter of the circle: "+(2*pi*r));
   }
   public void area()
   {
      System.out.println("Perimeter of the circle: "+(pi*r*r));
   }
}
class Rectangle implements prop
{
   double l,b;
   Scanner sc = new Scanner(System.in);
   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();
    }
    public void area()
    {
        System.out.println("Perimeter of a rectangle: "+(l*b));
    }
    public void perimeter()
    {
        System.out.println("Perimeter of a rectangle: "+(2*(l+b)));
    }
}
public class Function
{
    public static void main(String[] args)
    {
        System.out.println("course_name:OOP LAB");
        System.out.println("Course_code:20MCA132");
        System.out.println("  Name     : Aparna Jayakumar");
        System.out.println("Register_no: SJC22MCA-2012");
        System.out.println("Date       :07/06/2023");
        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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Function.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Function
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
Date       :07/06/2023

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
2
Perimeter of the circle: 12.56
Perimeter of the circle: 12.56

1.Circle
2.Rectangle
3.exit
Enter your choice:
2
Enter the length of the rectangle:
2
Enter the breadth of the rectangle:
3
Perimeter of a rectangle: 6.0
Perimeter of a rectangle: 10.0

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

7. Prepare bill with the given format using the 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();
   }
```

```
    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 Amount
{
    public static void main(String[] args)
    {
        System.out.println("course_name:OOP LAB");
        System.out.println("Course_code:20MCA132");
        System.out.println("  Name     : Aparna Jayakumar");
        System.out.println("Register_no: SJC22MCA-2012");
        System.out.println("Date       :07/06/2023");
        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("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:-

```
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ javac Amount.java
sjcet@Z238-UL:~/APARNA JAYAKUMAR/JAVA/cycle3$ java Amount
course_name:OOP LAB
Course_code:20MCA132
  Name     : Aparna Jayakumar
Register_no: SJC22MCA-2012
  Date     :07/06/2023
Order no. #20915
Enter the date:
13
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:13
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
```