10. Area of different shapes using overloaded functions

Program:

```
import java.util.Scanner;
public class AreaCalculator
{
   void calculateArea(float x)
   {
      System.out.println("Area of the square: " + x * x + " sq units");
   }
   void calculateArea(float x, float y)
   {
      System.out.println("Area of the rectangle: " + x * y + " sq units");
   }
   void calculateArea(double r)
   {
      double area = 3.14 * r * r;
      System.out.println("Area of the circle: " + area + " sq units");
   }

   public static void main(String args[])
   {
      Scanner scanner = new Scanner(System.in);
      AreaCalculator obj = new AreaCalculator();
     System.out.println("Merin Babu\n23MCA042 \n13-02-24\n");
     System.out.println("Enter the dimensions:");
      System.out.print("Enter side length of the square: ");
      float side = scanner.nextFloat();
      obj.calculateArea(side);
      System.out.print("Enter length of the rectangle: ");
      float length = scanner.nextFloat();
      System.out.print("Enter width of the rectangle: ");
      float width = scanner.nextFloat();
      obj.calculateArea(length, width);
      System.out.print("Enter radius of the circle: ");
      double radius = scanner.nextDouble();
      obj.calculateArea(radius);
      scanner.close();
   }
}
```

Output:

```
mca@Z238-UL:~/Merinjava$ javac AreaCalculator.java
mca@Z238-UL:~/Merinjava$ java AreaCalculator
Merin Babu
23MCA042
13-02-24

Enter the dimensions:
Enter side length of the square: 5
Area of the square: 25.0 sq units
Enter length of the rectangle: 6
Enter width of the rectangle: 3
Area of the rectangle: 18.0 sq units
Enter radius of the circle: 2
Area of the circle: 12.56 sq units
```

11. 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.

Program:

```
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("Merin Babu\n23MCA042 \n13-02-24\n");
            System.out.println("Enter 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("Enter Employee Name: ");
                    String Name=sc.next();
                    System.out.println("Enter Salary: ");
                    double Salary=sc.nextDouble();
                    System.out.println("Enter Address: ");
                    String Address=sc.next();
                    System.out.println("Enter department: ");
                    String dept=sc.next();
                    System.out.println("Enter 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();
    }
}
```

```
mca@Z238-UL:~/Merinjava$ javac Teacher.java
mca@Z238-UL:~/Merinjava$ java Teacher
Merin Babu
23MCA042
13-02-24

Enter the No. of Employee's
3

Enter Employee id:
101
Enter Employee Name:
Merin
Enter Salary:
5600
Enter Address:
Kanneth
Enter department:
MCA
Enter Subject:
Computer

Enter Employee id:
102
Enter Employee Name:
Lakshmi
Enter Salary:
4500
Enter Address:
Neduviliyil
Enter department:
MBA
Enter Subject:
Business Management

Enter Employee id:
103
Enter Employee Name:
Keerthana
Enter Salary:
6700
Enter Address:
Kavanakuzhiyil
```

```
Enter Employee id:
103
Enter Employee Name:
Keerthana
Enter Salary:
6700
Enter Address:
Kavanakuzhiyil
Enter department:
MSC
Enter Subject:
Electronics

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

1).
Employee id: 101
Name: Merin
Salary: 5600.0
Address: Kanneth
Department: MCA
Subject: Computer

2).
Employee id: 102
Name: Lakshmi
Salary: 4500.0
Address: Neduviliyil
Department: MBA
Subject: Business

3).
Employee id: 103
Name: Keerthana
Salary: 6700.0
Address: Kavanakuzhiyil
Department: MSC
Subject: Electronics
```

12. 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.

Program:

```
import java.util.Scanner;
class Person {
String name;
String gender;
String address;
int age;
public 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 companyName;
String qualification;
double salary;
public Employee(String name, String gender, String address, int age, int empId, String
companyName, String qualification, double salary) {
super(name, gender, address, age);
this.empId = empId;
this.companyName = companyName;
this.qualification = qualification;
this.salary = salary;
}
}

class Teacher extends Employee {

String subject;
String department;
```

```
int teacherId;
public Teacher(String name, String gender, String address, int age, int empId, String
companyName, String qualification, double salary, String subject, String department, int
teacherId) {
super(name, gender, address, age, empId, companyName, qualification, salary);
this.subject = subject;
this.department = department;
this.teacherId = teacherId;
}
public void displayDetails() {
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: " + companyName);
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);
System.out.println("----------------------------------------");
}
}
public class Inherit {
public static void main(String[] args) {
System.out.println("Merin Babu\n23MCA042 \n13-02-24\n");
System.out.println();
Scanner scanner = new Scanner(System.in);
System.out.print("Enter the number of teachers: ");
int N = scanner.nextInt(); // Number of teachers

Teacher[] teachers = new Teacher[N];
for (int i = 0; i < N; i++) {
scanner.nextLine(); // Consume the newline character
System.out.println("Enter details for Teacher " + (i + 1) + ":");
System.out.print("Name: ");
String teacherName = scanner.nextLine();
System.out.print("Gender: ");
String gender = scanner.nextLine();
System.out.print("Address: ");
String address = scanner.nextLine();
```

```
System.out.print("Age: ");
int age = scanner.nextInt();
System.out.print("Employee ID: ");
int empId = scanner.nextInt();
scanner.nextLine(); // Consume the newline character
System.out.print("Company Name: ");
String companyName = scanner.nextLine();
System.out.print("Qualification: ");
String qualification = scanner.nextLine();
System.out.print("Salary: ");
double salary = scanner.nextDouble();
scanner.nextLine(); // Consume the newline character
System.out.print("Subject: ");
String subject = scanner.nextLine();
System.out.print("Department: ");
String department = scanner.nextLine();
System.out.print("Teacher ID: ");
int teacherId = scanner.nextInt();
teachers[i] = new Teacher(teacherName, gender, address, age, empId,
companyName, qualification, salary, subject, department, teacherId);
System.out.println();
}
System.out.println("-------------------------");
System.out.println("Teacher Details:");
System.out.println("-------------------------"); for
(Teacher teacher : teachers) {
teacher.displayDetails();
}
}
}
```

Output:

```
mca@Z238-UL:~/Merinjava$ javac Inherit.java
mca@Z238-UL:~/Merinjava$ java Inherit
Merin Babu
23MCA042
13-02-24


Enter the number of teachers: 4
Enter details for Teacher 1:
Name: Merin
Gender: Female
Address: Kanneth
Age: 22
Employee ID: 101
Company Name: TCS
Qualification: MCA
Salary: 79000
Subject: Computer Application
Department: MCA
Teacher ID: 200

Enter details for Teacher 2:
Name: Lakshmi
Gender: Female
Address: Neduviliyil
Age: 21
Employee ID: 102
Company Name: Infosys
Qualification: MBA
Salary: 8900
Subject: CS
Department: CSE
Teacher ID: 201
```

```
Enter details for Teacher 3:
Name: Sandra Krishna
Gender: Female
Address: vathalloor
Age: 22
Employee ID: 103
Company Name: TCS
Qualification: MCA
Salary: 56000
Subject: EEE
Department: EEE
Teacher ID: 202

Enter details for Teacher 4:
Name: Manu
Gender: Male
Address: abcd
Age: 26
Employee ID: 103
Company Name: TCS
Qualification: MCA
Salary: 7800
Subject: ADBMS
Department: CSE
Teacher ID: 203

------------------------
Teacher Details:
------------------------
Name: Merin
Gender: Female
Address: Kanneth
Age: 22
Employee ID: 101
Company Name: TCS
Qualification: MCA
Salary: 79000.0
Subject: Computer Application
Department: MCA
Teacher ID: 200
------------------------------------
```

```
Name: Lakshmi
Gender: Female
Address: Neduviliyil
Age: 21
Employee ID: 102
Company Name: Infosys
Qualification: MBA
Salary: 8900.0
Subject: CS
Department: CSE
Teacher ID: 201
-------------------------------------
Name: Sandra Krishna
Gender: Female
Address: vathalloor
Age: 22
Employee ID: 103
Company Name: TCS
Qualification: MCA
Salary: 56000.0
Subject: EEE
Department: EEE
Teacher ID: 202
-------------------------------------
Name: Manu
Gender: Male
Address: abcd
Age: 26
Employee ID: 103
Company Name: TCS
Qualification: MCA
Salary: 7800.0
Subject: ADBMS
Department: CSE
Teacher ID: 203
-------------------------------------
```

13. 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.

Program:

```
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("Merin Babu\n23MCA042 \n06-04-24\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.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:

```
mca@Z238-UL:~/Merinjava$ javac BookDetails.java
mca@Z238-UL:~/Merinjava$ java BookDetails
Merin Babu
23MCA042
06-04-24

How many Literature books do you want to add? 1
How many Fiction books do you want to add? 1

Enter details for Literature book 1:
Enter the title of the book: RAM C/O ANADHI
Enter the author of the book: AKHIL P DHARMAJAN
Enter the publisher of the book: ABCD

Enter details for Fiction book 1:
Enter the title of the book: The Alchemist
Enter the author of the book: Paulo
Enter the publisher of the book: csf

Literature Books:
Title: RAM C/O ANADHI
Author: AKHIL P DHARMAJAN
Publisher: ABCD


Fiction Books:
Title: The Alchemist
Author: Paulo
Publisher: csf
```

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

Program:

```
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("No. of Sport items:"+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("Merin Babu\n23MCA042 \n06-04-24\n");
      Scanner sc =new Scanner(System.in);
      System.out.println("Enter the Sports Details of Student");
      System.out.println("no. of Sport items: ");
```

```
        String a =sc.next();
        System.out.println("Sport Rating  out of 10: ");
        int b =sc.nextInt();
        System.out.println("\nEnter the Sports Details of Student");
        System.out.println("Academic Grade: ");
        String c =sc.next();
        System.out.println("Overall percentage: ");
        double d =sc.nextDouble();
        sc.close();
        Result obj= new Result(a,b,c,d);
        obj.display();
    }}
```

Output:

```
mca@Z238-UL:~/Merinjava$ javac Result.java
mca@Z238-UL:~/Merinjava$ java Result
Merin Babu
23MCA042
06-04-24

Enter the Sports Details of Student
no. of Sport items:
2
Sport Rating  out of 10:
9

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

Sports Details of Student
No. of Sport items:2
Rating:9

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

15. 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.

Program:

```
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("Perimeter 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("Perimeter of a rectangle: "+(l*b));
    }
    @Override
    public void perimeter()
    {
        System.out.println("Perimeter of a rectangle: "+(2*(l+b)));
    }
}
public class shape6
{
    public static void main(String[] args)
    {

        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:

```
mca@Z238-UL:~/Merinjava$ javac Objects.java
mca@Z238-UL:~/Merinjava$ java Objects
 Merin babu
 23mca042
 8/4/2024

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
2
Area 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:
4
Enter the breadth of the rectangle:
3
Area of a rectangle: 12.0
Perimeter of a rectangle: 14.0

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

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

Program:

```
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 Order
{
   public static void main(String[] args)
   {
```

```
        System.out.println("Merin Babu\n23MCA042 \n8/4/2024");
        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:

```
mca@Z238-UL:~/Merinjava$ javac Order.java
mca@Z238-UL:~/Merinjava$ java Order
Merin Babu
23MCA042
8/4/2024
Order no. #70583
Enter the date:
08/04/24
Enter how many products are there:
2

Enter product id:
1234
Enter product name:
santhoor
Enter the Quantity:
6
Enter the unit price:
35

Enter product id:
6789
Enter product name:
bottle
Enter the Quantity:
5
Enter the unit price:
120
Date:08/04/24
Product Id      Name       Quantity        unit price    Total
-------------------------------------------------------------
1234            santhoor                6               35.0    210.0
6789            bottle          5               120.0   600.0
-------------------------------------------------------------
                      Net.Amount      810.0
```