10) Area of different shapes using overloaded functions.

Source code:

```
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[]) {
        System.out.println("Name : Shijo jose\nRoll.no : 51\nTitle : Area Calculator\n");
        Scanner scanner = new Scanner(System.in);
AreaCalculatorobj = new AreaCalculator();

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();
```
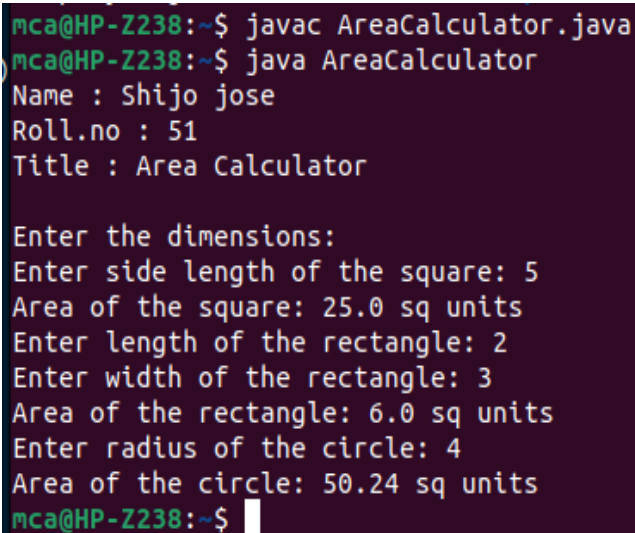
obj.calculateArea(length, width);

System.out.print("Enter radius of the circle: ");

    double radius = scanner.nextDouble();

obj.calculateArea(radius);

scanner.close();

    }

}

Output:

```
mca@HP-Z238:~$ javac AreaCalculator.java
mca@HP-Z238:~$ java AreaCalculator
Name : Shijo jose
Roll.no : 51
Title : Area Calculator

Enter the dimensions:
Enter side length of the square: 5
Area of the square: 25.0 sq units
Enter length of the rectangle: 2
Enter width of the rectangle: 3
Area of the rectangle: 6.0 sq units
Enter radius of the circle: 4
Area of the circle: 50.24 sq units
mca@HP-Z238:~$
```

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

Source 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);
```

```java
            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("Name : Shijo jose\nRoll.no : 51\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("Enter 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();
```

```java
            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("********Informations of all the
    employee's************");

            for(int i=0;i<num;i++)

            {

            int j=i+1;

            System.out.println(+j+").");

            arr[i].display();

            }

            sc1.close();

        }

}
```

Output:

```
mca@HP-Z238:~$ javac Teacher.java
mca@HP-Z238:~$ java Teacher
Name : Shijo jose
Roll.no : 51

Enter the No. of Employee's
2
Enter Employee id:
123
Enter Employee Name:
shijo
Enter Salary:
4000
Enter Address:
s villa m noor
Enter department:
Enter Subject:
Enter Employee id:
124
Enter Employee Name:
shaibin
Enter Salary:
4000
Enter Address:
doot b nuytr
Enter department:
Enter Subject:
********Informations of all the employee's***********
1).
Employee id: 123
Name: shijo
Salary: 4000.0
Address: s
Department: villa
Subject: m
2).
Employee id: 124
Name: shaibin
Salary: 4000.0
Address: doot
Department: b
Subject: nuytr
```

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

Source code:

```java
import java.util.Scanner;
 class person
 {
    String Name;
    String Gender;
    String Address;
    int Age;
person(String name,Stringgender,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;
```

```java
long Salary;


Employee(String name,Stringgender,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,Stringgender,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);
```

```java
        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 : Shijo jose\nRoll.no : 51\n");

        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:

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

1).
Name: shijo
Gender: male
Address: angadickal
Age: 23
Employee id: 101
Company Name: neon
Qualification: mca
Salary: 3000
Subject: maths
Department: computer
Teacher id: science
```

13) Write a program has class Publisher, Book, Literature and Fiction. Read the information and print the details of books from either the category, usinginheritance.

Source code:

```java
import java.util.Scanner;
class Publisher {
    String name;


Publisher(String name) {
        this.name = name;

    }
}
class Book extends Publisher {
    String title;
    String author;


Book(String title, String author, String publisher) {
        super(publisher);
this.title = title;
this.author = author;
    }
    void display() {
System.out.println("Title: " + title);
System.out.println("Author: " + author);
System.out.println("Publisher: " + name);
    }
}
class Literature extends Book {
```

```java
Literature(String title, String author, String publisher) {

super(title, author, publisher);

    }

}

class Fiction extends Book {

Fiction(String title, String author, String publisher) {

super(title, author, publisher);

    }

}

public class BookDetails {

    public static void main(String[] args) {

        System.out.println("Name : Shijo jose\nRoll.no : 51\n");

        Scanner scanner = new Scanner(System.in);


System.out.print("How many Literature books do you want to add? ");

        int numLiteratureBooks = scanner.nextInt();

scanner.nextLine();

System.out.print("How many Fiction books do you want to add? ");

        int numFictionBooks = scanner.nextInt();

scanner.nextLine();


Book[] literatureBooks = new Book[numLiteratureBooks];

Book[] fictionBooks = new Book[numFictionBooks];


        for (int i = 0; i<numLiteratureBooks; i++) {

System.out.println("\nEnter details for Literature book " + (i + 1) + ":");

literatureBooks[i] = createBook(scanner, "Literature");

        }

        for (int i = 0; i<numFictionBooks; i++) {

System.out.println("\nEnter details for Fiction book " + (i + 1) + ":");
```

```java
            fictionBooks[i] = createBook(scanner, "Fiction");
        }
    System.out.println("\nLiterature Books:");

    displayBooks(literatureBooks);

    System.out.println("\nFiction Books:");

    displayBooks(fictionBooks);

    scanner.close();

        }

        private static Book createBook(Scanner scanner, String type) {

    System.out.print("Enter the title of the book: ");

            String title = scanner.nextLine();

    System.out.print("Enter the author of the book: ");

            String author = scanner.nextLine();

    System.out.print("Enter the publisher of the book: ");

            String publisher = scanner.nextLine();

            if (type.equals("Literature")) {

                return new Literature(title, author, publisher);

            } else if (type.equals("Fiction")) {

                return new Fiction(title, author, publisher);

            } else {

                return null;

            }

        }

        private static void displayBooks(Book[] books) {

            for (Book book : books) {

    book.display();

    System.out.println();

            }

        }

    }
```

Output:

```
mca@HP-Z238:~$ javac BookDetails.java
mca@HP-Z238:~$ java BookDetails
Name : Shijo jose
Roll.no : 51

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: harry
Enter the author of the book: shijo
Enter the publisher of the book: vb books

Enter details for Fiction book 1:
Enter the title of the book: soper
Enter the author of the book: shaibin
Enter the publisher of the book: bnm books

Literature Books:
Title: harry
Author: shijo
Publisher: vb books


Fiction Books:
Title: soper
Author: shaibin
Publisher: bnm books
```

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

Source 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,Stringgd, double per ){
super(spo, ra);
    Grade = gd;
Overall_per = per;
    }
}
public class Result extends student {
Result(String spo, int ra,Stringgd, double per ){
super(spo, ra, gd, per);
    }
    void display(){
System.out.println("\nSports Details of Student");
```

```java
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) {

        Scanner sc =new Scanner(System.in);

System.out.println("Name : Shijo jose\nRoll.no : 51\n");

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@HP-Z238:~$ javac Result.java
mca@HP-Z238:~$ java Result
Name : Shijo jose
Roll.no : 51

Enter the Sports Details of Student
no. of Sport items:
1
Sport Rating  out of 10:
6

Enter the Sports Details of Student
Academic Grade:
a
Overall percentage:
79

Sports Details of Student
No. of Sport items:1
Rating:6

Academic Details of Student
Academic Grade :a
Overall percentage :79.0%
```

15)Create an interface having prototypes of functions area() and perimeter(). Create twoclasses Circle and Rectangle which implements the above interface. Create a menu drivenprogram to find area and perimeter of objects.

Source 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
```

```java
    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("Perimeter of a rectangle: "+(2*(l+b)));

    }

    @Override

    public void perimeter()

    {

        System.out.println("Area of a rectangle: "+(l*b));

    }

}

public class Objects

{
```

```java
    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@HP-Z238:~$ javac Objects.java
mca@HP-Z238:~$ java Objects

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
3
Area of the circle: 28.26
Perimeter of the circle: 18.84

1.Circle
2.Rectangle
3.exit
Enter your choice:
2
Enter the length of the rectangle:
5
Enter the breadth of the rectangle:
5
Perimeter of a rectangle: 20.0
Area of a rectangle: 25.0

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

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

Order No.

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

Date:

Source 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:");
```

```java
      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 Bill
  {
      public static void main(String[] args)
      {
         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:

```
^Cmca@HP-Z238:~$ java Bill
Order no. #770321
Enter the date:
23-08-2025
Enter how many products are there:
2

Enter product id:
101
Enter product name:
choco
Enter the Quantity:
2
Enter the unit price:
10

Enter product id:
102
Enter product name:
lays
Enter the Quantity:
2
Enter the unit price:
20
Date:23-08-2025
Product Id        Name         Quantity        unit price      T
--------------------------------------------------------------
101               choco            2               10.0      20
102               lays             2               20.0      40
--------------------------------------------------------------
                               Net.Amount      60.0
```