

## Lab Cycle 3

### 1. Area of different shapes using overloaded functions

```
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 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 with dimensions "+a1+" X "+b1+" X "+c1+" = "+Area_val);
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
        System.out.println("\nEnter the Length:");
        int l = sc.nextInt();
        System.out.println("Enter the Breadth:");
        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);
    }
}
```

```
sjcet@Z238-UL:~/Athul/Java/C3$ javac Shapes.java  
sjcet@Z238-UL:~/Athul/Java/C3$ java Shapes
```

Name: Athul Ajay

Reg No: SJC22MCA-017

Date: 14/06/2023

Course code: 20MCA132

Enter the Length:

5

Enter the Breadth:

4

Enter the Height:

3

Enter the Radius:

2

Area of Circle is Radius 2 = 12.56

Area of Rectangle with dimensions 5 X 4 = 20

Area of Cuboid with dimensions 5 X 4 X 3 = 60

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.

```
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("\nEnter the No. of Employees:");
        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 employees*****");
    for(int i=0;i<num;i++){
        int j=i+1;
        System.out.println("\n"+j+").");
        arr[i].display();
        System.out.println();
        System.out.println();
        System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");

    }
    sc1.close();
}

}

```

```
sjcet@Z238-UL:~/Athul/Java/C3$ javac Teacher.java
sjcet@Z238-UL:~/Athul/Java/C3$ java Teacher

Enter the No. of Employees:
1

Enter Employee id:
001

Enter Employee Name:
Ashish

Enter Salary:
40000

Enter Address:
aabb

Enter department:
IT

Enter Subject:
Java

*****Informations of all the employees*****

1).
Employee id: 1
Name: Ashish
Salary: 40000.0
Address: aabb
Department: IT
Subject: Java

Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132
```

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.

```
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();
    System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
    System.out.println("\nEnter the No. of Teachers:");
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("\nName: ");
        String a =sc.next();

```

```

        System.out.println("\nGender: ");
        String b =sc.next();
        System.out.println("\nAddress: ");
        String c =sc.next();
        System.out.println("\nAge: ");          int
        d =sc.nextInt();
        System.out.println("\nEmployee id: ");
        int e =sc.nextInt();
        System.out.println("\nCompany name: ");
        String f =sc.next();
        System.out.println("\nQualification: ");
        String g =sc.next();
        System.out.println("\nSalary: ");
        long h =sc.nextLong();
        System.out.println("\nSubject: ");
        String k =sc.next();
        System.out.println("\nDepartment: ");
        String l =sc.next();
        System.out.println("\nTeacher 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("\nInformations of all the Teachers");
    for(int i=0;i<num;i++){
        j=i+1;
        System.out.println("\n"+j+".");
        arr[i].display();

    }
    sc1.close();
}
}

```



```
sjcet@Z238-UL:~/Athul/Java/C3$ javac Teacher2.java
sjcet@Z238-UL:~/Athul/Java/C3$ java Teacher2
```

```
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132
```

```
Enter the No. of Teachers:
1
```

```
Enter the Teacher Details:
```

```
1).
```

```
Name:
Aswathy
```

```
Gender:
F
```

```
Address:
aabb
```

```
Age:
21
```

```
Employee id:
23
```

```
Company name:
TCS
```

Qualification:

MCA

Salary:

23900

Subject:

Python

Department:

IT

Teacher Id:

54

Informations of all the Teachers

1).

Name: Aswathy

Gender: F

Address: aabb

Age: 21

Employee id: 23

Company Name: TCS

Qualification: MCA

Salary: 23900

Subject: Python

Department: IT

Teacher id: 54

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.

```
import java.util.ArrayList; import
java.util.List;
import java.util.Scanner;

class Publisher {
    private String name;

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

    public String getName() {
        return name;
    }
}

class Book {
    private String title;
    private int year;
    private Publisher publisher;

    public Book(String title, int year, Publisher publisher) {
this.title = title;      this.year = year;
        this.publisher = publisher;
    }

    public String getTitle() {
        return title;
    }

    public int getYear() {
        return year;
    }

    public Publisher getPublisher() {
        return publisher;
    }
}
```

```

class Literature extends Book {
    public Literature(String title, int year, Publisher publisher) {
        super(title, year, publisher);
    }
}

class Fiction extends Book {
    public Fiction(String title, int year, Publisher publisher) {
        super(title, year, publisher);
    }
}

public class BookManager {
    public static void main(String[] args) {
        List<Book> books = new ArrayList<>();

        Publisher publisher1 = new Publisher("Publisher A");
        Publisher publisher2 = new Publisher("Publisher B");

        Scanner scanner = new Scanner(System.in);

        for (int i = 1; i <= 2; i++) {
            System.out.println("Enter details for Book " + i);
            System.out.print("Title: ");
            String title = scanner.nextLine();
            System.out.print("Year: ");           int
            year = scanner.nextInt();
            scanner.nextLine(); // Consume the remaining newline character

            System.out.print("Publisher: ");
            String publisherName = scanner.nextLine();
            Publisher publisher = new Publisher(publisherName);

            System.out.print("Category (Literature/Fiction): ");
            String category = scanner.nextLine();

            if (category.equalsIgnoreCase("Literature")) {
                Book book = new Literature(title, year, publisher);
                books.add(book);
            } else if (category.equalsIgnoreCase("Fiction")) {
                Book book = new Fiction(title, year, publisher);
                books.add(book);
            } else {

```

```
        System.out.println("Invalid category. Skipping Book " + i);
    continue;
    }
}

    System.out.println("Books in the Literature category:");
    printBooksByCategory(books, "Literature");

    System.out.println("Books in the Fiction category:");
    printBooksByCategory(books, "Fiction");
}

private static void printBooksByCategory(List<Book> books, String category) {
for (Book book : books) {
    if (book.getClass().getSimpleName().equals(category)) {
        System.out.println();
        System.out.println();
        System.out.println("Title: " + book.getTitle());
        System.out.println("Year: " + book.getYear());
        System.out.println("Publisher: " + book.getPublisher().getName());
        System.out.println();
        System.out.println();
        System.out.println();
        System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");

    }
}
}
}
```

```
sjcet@Z238-UL:~/Athul/Java/C3$ javac BookManager.java
sjcet@Z238-UL:~/Athul/Java/C3$ java BookManager
Enter details for Book 1
Title: To Kill a Mockingbird
Year: 1960
Publisher: Grand Central Publishing
Category (Literature/Fiction): Literature
Enter details for Book 2
Title: The Great Gatsby
Year: 1925
Publisher: Charles Scribner's Sons
Category (Literature/Fiction): Fiction
Books in the Literature category:
```

```
Title: To Kill a Mockingbird
Year: 1960
Publisher: Grand Central Publishing
```

```
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132
Books in the Fiction category:
```

```
Title: The Great Gatsby
Year: 1925
Publisher: Charles Scribner's Sons
```

```
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132
```

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

```
import java.util.Scanner;

// Create classes Student and Sports. Create another class Result inherited from
// Student and
// Sports. Display the academic and sports score of a student
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) {
        Scanner sc =new Scanner(System.in);
        System.out.println();
        System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");
    }
}
```

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



```
sjcet@Z238-UL:~/Athul/Java/C3$ javac result.java
sjcet@Z238-UL:~/Athul/Java/C3$ java result
```

```
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132
```

```
Enter the Sports Details of Student
```

```
Sport:
Football
```

```
Sport Rating out of 10:
8
```

```
Enter the Sports Details of Student
```

```
Academic Grade:
A
```

```
Overall percentage:
92
```

```
Sports Details of Student
Sport :Football
Rating :8
```

```
Academic Details of Student
Academic Grade :A
Overall percentage :92.0
```

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.

```
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
{
    double l, b;
    Scanner sc = new Scanner(System.in);
    @Override
    public void getdata()
    {
        System.out.println("Enter the length and breadth of the rectangle:");
        l = sc.nextDouble();
        b = sc.nextDouble();
    }
    @Override
    public void area()
    {
        System.out.println("Area of the rectangle: " + (l * b));
    }
    @Override
    public void perimeter()
    {
        System.out.println("Perimeter of the rectangle: " + (2 * (l + b)));
    }
}
```

```

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

public class Objects
{
    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("Name: Athul Ajay");
            System.out.println("Reg No: SJC22MCA-017");
            System.out.println("Date: 15/06/2023");
            System.out.println("Course code: 20MCA132");
            System.out.println();
            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);
}
}
```

```
sjcet@Z238-UL:~/Athul/Java/C3$ javac Objects.java
sjcet@Z238-UL:~/Athul/Java/C3$ java Objects
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 15/06/2023
Course code: 20MCA132

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
4
Area of the circle: 50.24
Perimeter of the circle: 25.12
```

7. Prepare bill with the given format using calculate method from interface. Order No.

Date :

ProductId	Name	Quantity	unit price	Total
101	A	2	25	50
102	B	1	100	100
Net. Amount				150

```
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 Bills
{
    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("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
        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);

    }
}

```

```
sjcet@Z238-UL:~/Athul/Java/C3$ javac Bills.java
sjcet@Z238-UL:~/Athul/Java/C3$ java Bills
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 14/06/2023
Course code: 20MCA132

Order no. #944745
Enter the date:
17/08/25
Enter how many products are there:
1

Enter product id:
0098
Enter product name:
Soap
Enter the Quantity:
43
Enter the unit price:
2500
Date:17/08/25
Product Id      Name      Quantity      unit price      Total
-----
0098            Soap            43            2500.0    107500.0
-----
                        Net.Amount      107500.0
```