

LAB CYCLE - 3

1. Area of different shapes using overloaded functions

CODE:

```
import java.util.Scanner;

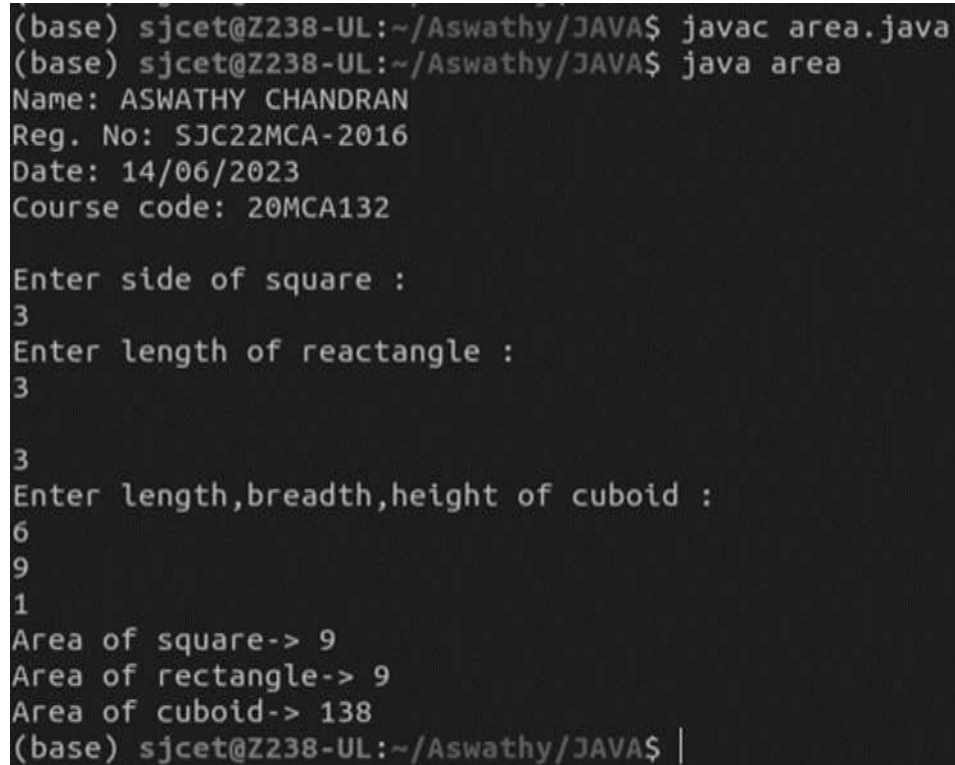
public class area{

    public static void main(String[] args){

        System.out.println("Name: ASWATHY CHANDRAN ");
        System.out.println("Reg. No: SJC22MCA-2016");
        System.out.println("Date: 14/06/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
        int s,sa,l,b,ra;
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter side of square : ");
        s=sc.nextInt();
        sa=Square(s);
        System.out.println("Enter length of reactangle : ");
        l=sc.nextInt();
        b=sc.nextInt();
        ra=Square(l,b);
        System.out.println("Enter length,breadth,height of cuboid : ");
        int cl,cb,ch,ca;
        cl=sc.nextInt();
        cb=sc.nextInt();
        ch=sc.nextInt();
        ca=Square(cl,cb,ch);
        System.out.println("Area of square-> "+sa);
        System.out.println("Area of rectangle-> "+ra);
        System.out.println("Area of cuboid-> "+ca);
    }

    public static int Square(int x){
        int a;
```

```
        a=x*x;
        return a;
    }
    public static int Square(int x, int y)
    {
        int a;
        a=x*y;
        return a;
    }
    public static int Square(int x,int y,int z)
    {
        int a;
        a=2*(x*y)+2*(x*z)+2*(y*z);
        return a;
    }
}
```

Output:

```
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ javac area.java
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java area
Name: ASWATHY CHANDRAN
Reg. No: SJC22MCA-2016
Date: 14/06/2023
Course code: 20MCA132

Enter side of square :
3
Enter length of reactangle :
3
3
Enter length,breadth,height of cuboid :
6
9
1
Area of square-> 9
Area of rectangle-> 9
Area of cuboid-> 138
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ |
```

- 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:

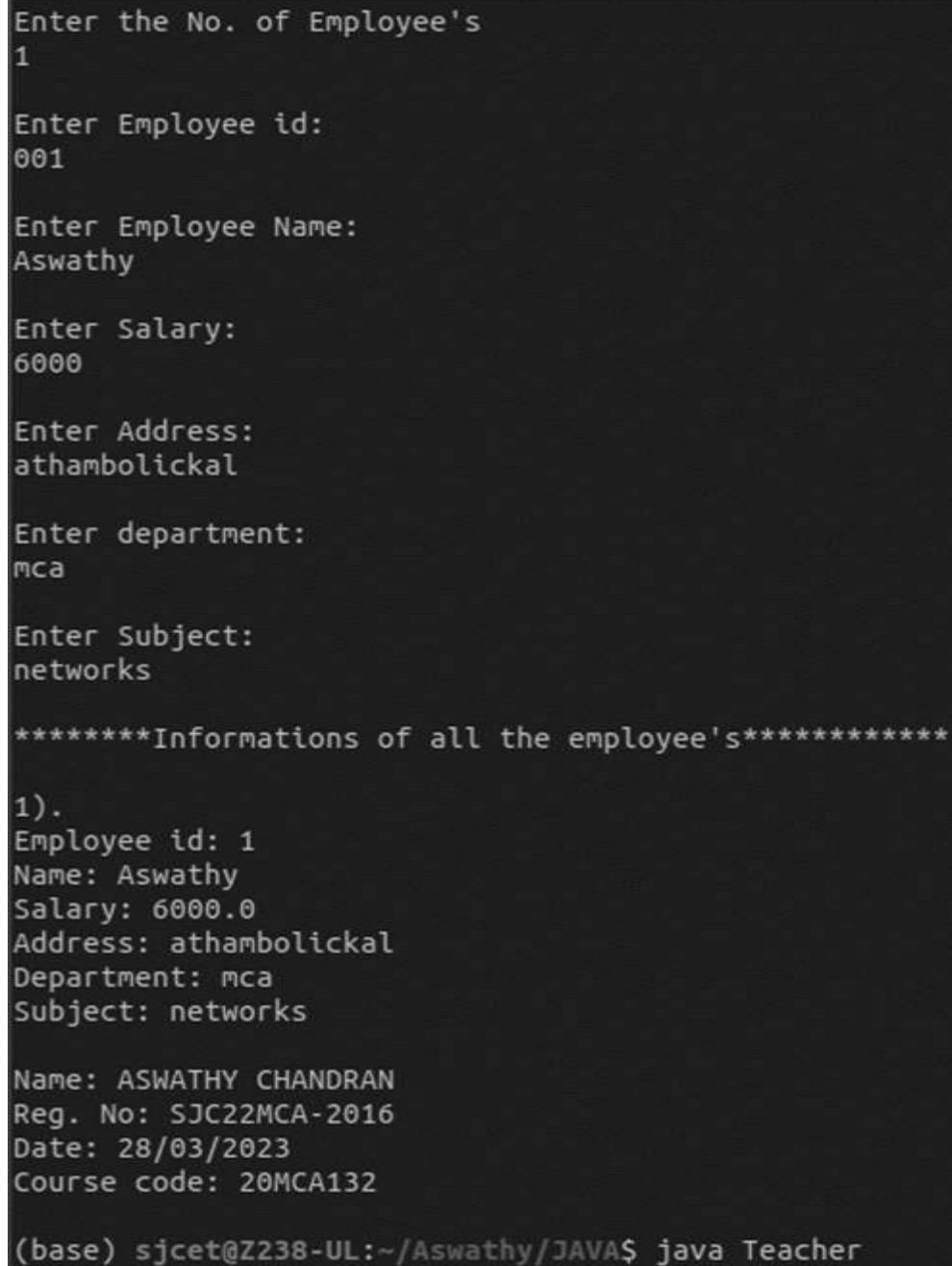
```
import java.util.Scanner;

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 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();
System.out.println();
System.out.println("Name: ASWATHY CHANDRAN");
System.out.println("Reg. No: SJC22MCA-2016");
System.out.println("Date: 28/03/2023");
```

```
        System.out.println("Course code: 20MCA132");
        System.out.println();
    }
    sc1.close();
}
```

Output:

```
Enter the No. of Employee's
1

Enter Employee id:
001

Enter Employee Name:
Aswathy

Enter Salary:
6000

Enter Address:
athambolickal

Enter department:
mca

Enter Subject:
networks

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

1).
Employee id: 1
Name: Aswathy
Salary: 6000.0
Address: athambolickal
Department: mca
Subject: networks

Name: ASWATHY CHANDRAN
Reg. No: SJC22MCA-2016
Date: 28/03/2023
Course code: 20MCA132

(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java Teacher
```

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:

```
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;
```

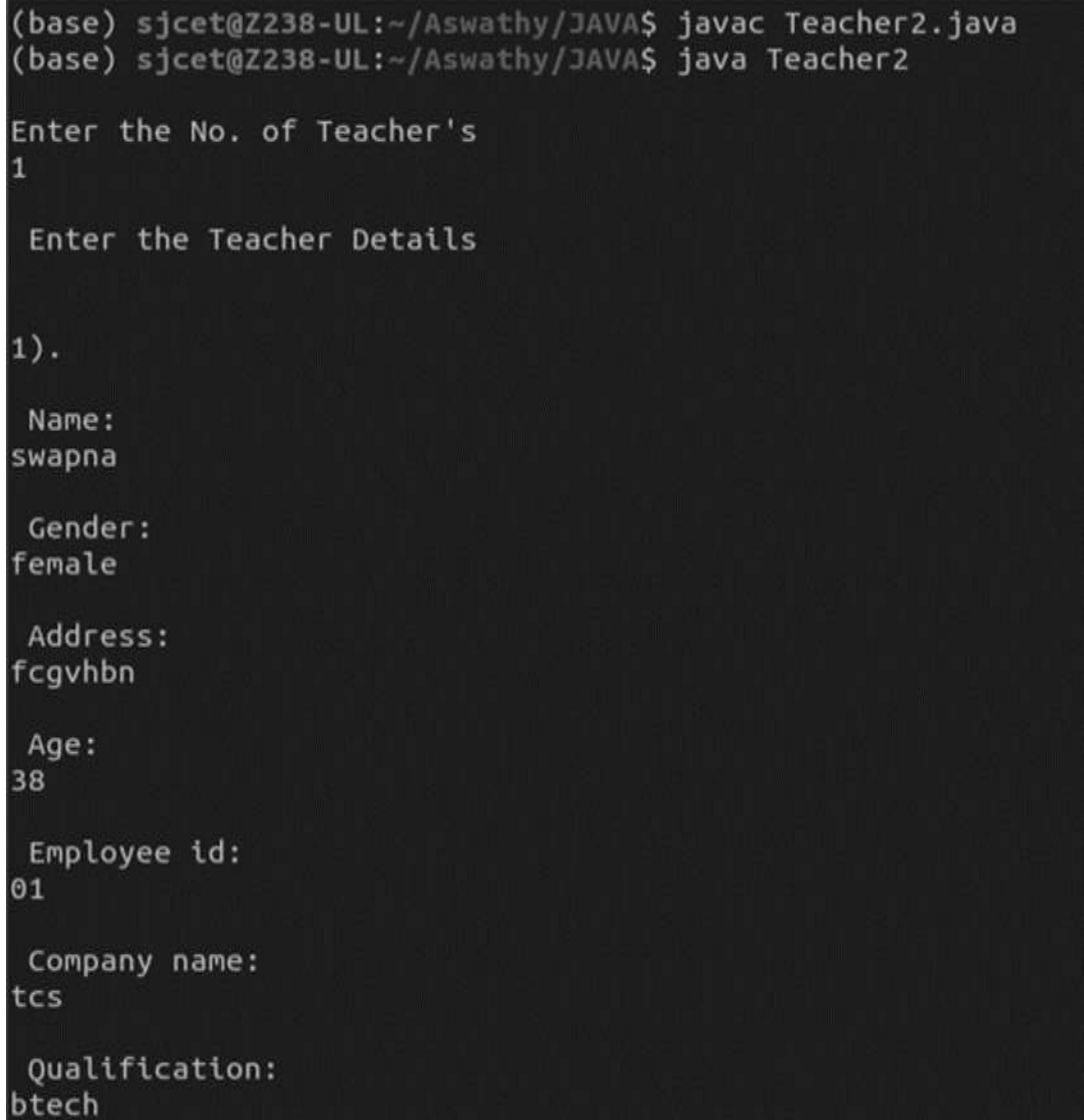
```
this.Qualification=qualification;
this.Salary=salary;
}
}

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("\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.print("\n"+x+").");
System.out.print("\n Name: ");
String a =sc.next();
System.out.print("\n Gender: ");
String b =sc.next();
System.out.print("\n Address: ");
String c =sc.next();
System.out.print("\n Age: ");
int d =sc.nextInt();
System.out.print("\n Employee id: ");
int e =sc.nextInt();
System.out.print("\n Company name: ");
String f =sc.next();
System.out.print In("\n Qualification: ");
String g =sc.next();
System.out.print("\n Salary: ");
long h =sc.nextLong();
System.out.print("\n Subject: ");
String k =sc.next();
System.out.print("\n Department: ");
String l =sc.next();
System.out.print("\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*****");
System.out.println();
```



```
System.out.println("Name: ASWATHY CHANDRAN");
System.out.println("Reg. No: SJC22MCA-2016");
System.out.println("Date: 28/03/2023");
System.out.println("Course code: 20MCA132");
System.out.println();
for(int i=0;i<num;i++){
    j=i+1;
}
sc1.close();
}
}
```

Output:

```
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ javac Teacher2.java
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java Teacher2

Enter the No. of Teacher's
1

Enter the Teacher Details

1).

Name:
swapna

Gender:
female

Address:
fcgvhbn

Age:
38

Employee id:
01

Company name:
tcs

Qualification:
btech
```

```
Company name:
tcs

Qualification:
btech

Salary:
70000

Subject:
networks

Department:
mca

Teacher Id:
1

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

Name: ASWATHY CHANDRAN
Reg. No: SJC22MCA-2016
Date: 28/03/2023
Course code: 20MCA132

(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java Teacher2
```

- 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:

```
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();
System.out.println("Name: ASWATHY CHANDRAN");
System.out.println("Reg No: SJC22MCA-016");
System.out.println("Date: 14/06/2023");
System.out.println("Course code: 20MCA132");
System.out.println();
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());
}
}
}
}
```

Output:

```
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ javac BookManager.java
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java BookManager
Enter details for Book 1
Title: Wings of Fire
Year: 2012
Publisher: APJ Abdul Kalam
Category (Literature/Fiction): Literature
Enter details for Book 2
Title: The Alchemist
Year: 1995
Publisher: Paulo Coelho
Category (Literature/Fiction): Fiction

Name: ASWATHY CHANDRAN
Reg No: SJC22MCA-016
Date: 14/06/2023
Course code: 20MCA132

Books in the Literature category:

Title: Wings of Fire
Year: 2012
Publisher: APJ Abdul Kalam
Books in the Fiction category:

Title: The Alchemist
Year: 1995
Publisher: Paulo Coelho
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ |
```

- 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) {
```

```
Scanner sc =new Scanner(System.in);
System.out.println("ASWATHY CHANDRAN\n22mca016\nOOPS
LAB\n20MCA132\nDate:15-06-2023");
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:~/Aswathy/JAVA$ java result
ASWATHY CHANDRAN
22mca016
OOPS LAB
20MCA132
Date:15-06-2023

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:
90

Sports Details of Student
Sport :CRICKET
Rating :9

Academic Details of Student
Academic Grade :A
Overall percentage :90.0
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ |
```

- 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:

```
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("Area 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("Area of a rectangle: "+(l*b));
}
public void perimeter(){
    System.out.println("Perimeter of a rectangle: "+(2*(l+b)));
}
}
public class C3_Q6{
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("ASWATHY CHANDRAN\n22MCA016\nOOPS
LAB\n20MCA132\nDate:15-06-2023");
        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:

```
ASWATHY CHANDRAN
22MCA016
OOPS LAB
20MCA132
Date:15-06-2023

1.Circle
2.Rectangle
3.exit
Enter your choice:
1
Enter the radius of the circle:
6
Area of the circle: 113.03999999999999
Perimeter of the circle: 37.68
ASWATHY CHANDRAN
22MCA016
OOPS LAB
20MCA132
Date:15-06-2023

1.Circle
2.Rectangle
3.exit
Enter your choice:
2
Enter the length of the rectangle:
3
Enter the breadth of the rectangle:
3
Area of a rectangle: 9.0
Perimeter of a rectangle: 12.0
ASWATHY CHANDRAN
22MCA016
OOPS LAB
20MCA132
Date:15-06-2023

1.Circle
2.Rectangle
3.exit
Enter your choice:
3
Exited...
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ |
```

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	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\t"+total);
    }
}

```

```
}  
public class C3_Q7  
{  
    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("ASWATHY CHANDRAN\n22MCA016\nOOPS  
LAB\n20MCA132\nDate:15-06-2023");  
        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:

```

(base) sjcet@Z238-UL:~/Aswathy/JAVA$ javac C3_Q7.java
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ java C3_Q7
ASWATHY CHANDRAN
22MCA016
OOPS LAB
20MCA132
Date:15-06-2023
Order no. #176282
Enter the date:
15/06/2023
Enter how many products are there:
2

Enter product id:
01
Enter product name:
PEN
Enter the Quantity:
2
Enter the unit price:
5

Enter product id:
001
Enter product name:
PENCIL
Enter the Quantity:
3
Enter the unit price:
10
Date:15/06/2023

```

Product Id	Name	Quantity	unit price	Total
01	PEN	2	5.0	10.0
001	PENCIL	3	10.0	30.0

```

-----
Net.Amount      40.0
(base) sjcet@Z238-UL:~/Aswathy/JAVA$ |

```