



# Assignment\_5

## Part -1

```
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import java.util.*;
import java.math.*;

// Problem statement:

public class As_5_abstract_implements {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the radius of circle: ");
        double radius = sc.nextDouble();
        System.out.println("Enter the length and breadth of rectangle: ");
        double length = sc.nextDouble();
        double breadth = sc.nextDouble();
        System.out.println("Enter the sides of triangle: ");
        double side1 = sc.nextDouble();
        double side2 = sc.nextDouble();
        double side3 = sc.nextDouble();
        circle c = new circle(radius);
        rectangle r = new rectangle(length, breadth);
        triangle t = new triangle(side1, side2, side3);
        System.out.println(c);
        System.out.println(r);
        System.out.println(t);
    }
}

interface Shape{
    void calculateArea();
    void calculatePerimeter();
}

class circle implements Shape{
    double radius;
    double circleArea, circlePerimeter;
    circle(double radius){
        this.radius = radius;
    }
    public void calculateArea(){
        circleArea = Math.PI*radius*radius;
        System.out.println("Area of circle is: "+(circleArea));
    }
    public void calculatePerimeter(){
        System.out.println("Perimeter of circle is: "+(2*Math.PI*radius));
    }

    // toString() method
    public String toString(){
        return "Circle with radius: "+radius +"and area: "+circleArea;
    }
}
```

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}

class rectangle implements Shape{
    double length;
    double breadth;
    double rectangleArea, rectanglePerimeter;
    rectangle(double length, double breadth){
        this.length = length;
        this.breadth = breadth;
    }
    public void calculateArea(){
        rectangleArea = length*breadth;
        System.out.println("Area of rectangle is: "+(length*breadth));
    }
    public void calculatePerimeter(){
        rectangleArea = 2*(length+breadth);
        System.out.println("Perimeter of rectangle is: "+(2*(length+breadth)));
    }
    // to string
    public String toString(){
        return "Rectangle with length: "+length+" breadth: "+breadth+" and area: "+rectangleArea;
    }
}

class triangle implements Shape{
    double side1;
    double side2;
    double side3;
    double triangleArea, trianglePerimeter;
    triangle(double side1, double side2, double side3){
        this.side1 = side1;
        this.side2 = side2;
        this.side3 = side3;
    }
    public void calculateArea(){
        double s = (side1+side2+side3)/2;
        System.out.println("Area of triangle is: "+(Math.sqrt(s*(s-side1)*(s-side2)*(s-side3))));
        triangleArea = Math.sqrt(s*(s-side1)*(s-side2)*(s-side3));
    }
    public void calculatePerimeter(){
        System.out.println("Perimeter of triangle is: "+(side1+side2+side3));
        trianglePerimeter = side1+side2+side3;
    }
    // to string
    public String toString(){
        return "Triangle with sides: "+side1+" "+side2+" "+side3+" and area: "+triangleArea;
    }
}

```

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Enter the radius of circle:
5
Enter the length and breadth of rectangle:
4 5
Enter the sides of triangle:
3 4 5
Circle with radius: 5.0 and area: 0.0
Rectangle with length: 4.0 breadth: 5.0 and area: 0.0
Triangle with sides: 3.0 4.0 5.0 and area: 0.0

```

## Part -2

```
class As_5_part2{
    public static void main(String[] args) {
        employee e1 = new employee(1, "Software Engineer", "IT", "01/01/2020", 10000, 30, 0, 1234567890, "SBI", 1234
        e1.print_slip();
    }
}

abstract class worker{
    // Details Name
    int employee_id;
    String designation;
    String department;
    String DOJ;
    int gross_wage;
    int total_working_days = 30;
    int paid_days;
    int LOP_days;
    int leaves_taken;

    int UAN;
    String bank_name;
    int bank_account_number;

    // Earnings

    float basic_wage;
    float HRA;
    float conveyance_allowance;
    float medical_allowance;
    float other_allowance;
    float total_earningscls;

    // Deductions

    public abstract float getEPF();
    public abstract float getESI();
    public abstract float getProfessionalTax();
    public abstract float getLoanRecovery();

    // Net Salary
    float net_salary;

    public void setPaidDays(int days) {
        this.paid_days = days;
        this.LOP_days = total_working_days - paid_days;
    }
}

// class for regular employee

class employee extends worker{
    // Earnings
    float EPF;
    float ESI;
    float Professional_tax;
    float Loan_recovery;
    float total_deductions;
```

```

float basic_wage;
float HRA;
float conveyance_allowance;
float medical_allowance;
float other_allowance;
float total_earnings;

employee(int employee_id, String designation, String department, String DOJ, int gross_wage, int paid_days, int
    this.employee_id = employee_id;
    this.designation = designation;
    this.department = department;
    this.Doj = DOJ;
    this.gross_wage = gross_wage;
    this.paid_days = paid_days;
    this.leaves_taken = leaves_taken;
    this.UAN = UAN;
    this.bank_name = bank_name;
    this.bank_account_number = bank_account_number;
    this.LOP_days = total_working_days - paid_days;

    this.basic_wage = ((gross_wage/total_working_days) * paid_days);
    this.HRA = basic_wage * 0.4f;
    this.conveyance_allowance = ((1600/total_working_days)*paid_days);
    this.medical_allowance = ((1250/total_working_days)*paid_days);
    this.other_allowance = ((gross_wage/total_working_days)*paid_days) - (HRA + conveyance_allowance + medical_a
    this.total_earnings = HRA + conveyance_allowance + medical_allowance + basic_wage + other_allowance;
}

public float getEPF(){
    if (gross_wage >= 15000){
        return EPF = 12/100f * basic_wage;
    }
    else{
        return EPF = 15/100f * basic_wage;
    }
}

public float getESI(){
    if (gross_wage >= 21000){
        return ESI = 0;
    }
    else{
        return ESI = 75/100f * basic_wage;
    }
}

public float getProfessionalTax(){
    if (gross_wage >= 15000){
        return Professional_tax = 0;
    }
    else{
        return Professional_tax = 50;
    }
}

public float getLoanRecovery(){
    return Loan_recovery = 0;
}

void print_slip(){
    // Calculate deductions
    EPF = getEPF();
    ESI = getESI();
    Professional_tax = getProfessionalTax();
    Loan_recovery = getLoanRecovery();
    float total_deductions = EPF + ESI + Professional_tax + Loan_recovery;
}

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// Calculate net salary
net_salary = total_earnings - total_deductions;

// Print payslip
System.out.printf("%-20s %-30s\n", "Employee ID:", employee_id);
System.out.printf("%-20s %-30s\n", "Designation:", designation);
System.out.printf("%-20s %-30s\n", "Department:", department);
System.out.printf("%-20s %-30s\n", "Date of Joining:", DOJ);
System.out.printf("%-20s %-30s\n", "Gross Wage:", gross_wage);
System.out.printf("%-20s %-30s\n", "Paid Days:", paid_days);
System.out.printf("%-20s %-30s\n", "Leaves Taken:", leaves_taken);
System.out.printf("%-20s %-30s\n", "UAN:", UAN);
System.out.printf("%-20s %-30s\n", "Bank Name:", bank_name);
System.out.printf("%-20s %-30s\n", "Bank Account Number:", bank_account_number);
System.out.printf("\n%-20s %-30s\n", "Earnings:", "");
System.out.printf("%-20s %-30s\n", "Basic Wage:", basic_wage);
System.out.printf("%-20s %-30s\n", "HRA:", HRA);
System.out.printf("%-20s %-30s\n", "Conveyance Allowance:", conveyance_allowance);
System.out.printf("%-20s %-30s\n", "Medical Allowance:", medical_allowance);
System.out.printf("%-20s %-30s\n", "Other Allowance:", other_allowance);
System.out.printf("%-20s %-30s\n", "Total Earnings:", total_earnings);
System.out.printf("\n%-20s %-30s\n", "Deductions:", "");
System.out.printf("%-20s %-30s\n", "EPF:", EPF);
System.out.printf("%-20s %-30s\n", "ESI:", ESI);
System.out.printf("%-20s %-30s\n", "Professional Tax:", Professional_tax);
System.out.printf("%-20s %-30s\n", "Loan Recovery:", loan_recovery);
System.out.printf("%-20s %-30s\n", "Total Deductions:", total_deductions);
System.out.printf("\n%-20s %-30s\n", "Net Salary:", net_salary);
}
}

```

Employee ID: 1  
Designation: Software Engineer  
Department: IT  
Date of Joining: 01/01/2020  
Gross Wage: 10000  
Paid Days: 30  
Leaves Taken: 0  
UAN: 1234567890  
Bank Name: SBI  
Bank Account Number: 1234567890

Earnings:  
Basic Wage: 9990.0  
HRA: 3996.0  
Conveyance Allowance: 1590.0  
Medical Allowance: 1230.0  
Other Allowance: -6816.0  
Total Earnings: 9990.0

Deductions:  
EPF: 1498.5  
ESI: 7492.5  
Professional Tax: 50.0  
Loan Recovery: 0.0  
Total Deductions: 9041.0

Net Salary: 949.0