Java Lab Assignment-5

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Part 1:

Circle.java

```
package Assn_5;

public class Circle implements Shape {
    float radius;
    double area;
    double perimeter;

    Circle(int radius) {
        this.radius = radius;
    }

    public void calculateArea() {
        this.area = Math.PI * Math.pow(radius, 2);
    }

    public void calculatePerimeter() {
        this.perimeter = 2 * Math.PI * this.radius;
    }

    public String toString() {
        return "Area: " + this.area + " Perimeter: " +
this.perimeter;
    }
}
```

Square.java

```
package Assn_5;

public class Square {
    float side;
    double area;
    double perimeter;
```

```
    Square(float side) {
        this.side = side;
    }

    public void calculateArea() {
        this.area = Math.pow(this.side, 2);
    }

    public void calculatePerimeter() {
        this.perimeter = this.side * 4;
    }

    public String toString() {
        return "Area: " + this.area + " Perimeter: " +
this.perimeter;
    }
}
```

Triangle.java

```
package Assn_5;

public class Triangle {
    double firstSide;
    double secondSide;
    double thirdSide;
    double perimeter;
    double area;

    Triangle(double firstSide, double secondSide, double
thirdSide) {
        this.firstSide = firstSide;
        this.secondSide = secondSide;
        this.thirdSide = thirdSide;
    }

    public void calculateArea() {
```

```
        double semi = (this.firstSide + this.secondSide +
this.thirdSide) / 2;
        this.area = Math.pow(
            semi * (semi - this.firstSide) * (semi -
this.secondSide) * (semi - this.thirdSide),
            0.5
        );
    }

    public void calculatePerimeter() {
        this.perimeter = this.firstSide + this.secondSide +
this.thirdSide;
    }

    public String toString() {
        return "Area: " + this.area + " Perimeter: " +
this.perimeter;
    }
}
```

Shape.java

```
package Assn_5;

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

ShapeTestDrive.java

```
package Assn_5;

public class ShapeTestDrive {
    public static void main(String[] args) {
        System.out.println("Circle: ");
        Circle c = new Circle(10);
        c.calculateArea();
        c.calculatePerimeter();
        System.out.println(c);
```

```
        System.out.println("Square: ");
        Square s = new Square(10);
        s.calculateArea();
        s.calculatePerimeter();
        System.out.println(s);
        System.out.println("Triangle: ");
        Triangle t = new Triangle(10, 20, 30);
        t.calculateArea();
        t.calculatePerimeter();
        System.out.println(t);
    }
}
```

Part 2

EmployeeBase.java

```
package Assn_5;

/*
This is the abstract class which represents all the
properties of the employee. It acts as the parent
class to NormalEmployee and BonusEmployee.
*/

public abstract class EmployeeBase {
    public String name;
    public int EID;
    public String designation;
    public String department;
    public String DOJ;
    public double grossWage;
    public int TWD = 30;
    public int LOP = 1;
    public int leavesTaken;

    public EmployeeBase(
        String name,
        int EID,
        String designation,
```

```
        String department,
        String DOJ,
        double grossWage,
        int leavesTaken
    ) {
        this.name = name;
        this.EID = EID;
        this.designation = designation;
        this.department = department;
        this.DOJ = DOJ;
        this.grossWage = grossWage;
        this.leavesTaken = leavesTaken;
    }

    public abstract double basicWage();

    public abstract double EPF();

    public abstract double HRA();

    public abstract double ESI();

    public abstract double coveyanceAllowance();

    public abstract double medicalAllowance();

    public abstract double otherAllowance();

    public abstract double totalEarnings();

    public abstract double totalDeductions();

    public double professionalTax() {
        return 0.0;
    }

    public double loanRecovery() {
        return 0.0;
```

```
    }

    public double bonus() {
        return 0;
    }

}
```

NormalEmployee.java

```
package Assn_5;

/*
This is the normal employee class which implements all
abstract methods from the EmployeeBase.
It acts as parent to BonusEmployee.
*/

public class NormalEmployee extends EmployeeBase{
    public NormalEmployee(
        String name,
        int EID,
        String designation,
        String department,
        String DOJ,
        double grossWage,
        int leavesTaken
    ) {
        super(
                name,
                EID,
                designation,
                department,
                DOJ,
                grossWage,
                leavesTaken);
    }

    public double basicWage() {
```

```
        return (this.grossWage / this.TWD) * (this.TWD -
this.LOP) * 0.45;
    }

    public double HRA() {
        return this.basicWage() * 0.4;
    }

    public double coveyanceAllowance() {
        return (1600 / this.TWD) * (this.TWD - this.LOP);
    }

    public double medicalAllowance() {
        return (1250 / this.TWD) * (this.TWD - this.LOP);
    }

    public double otherAllowance() {
        return ((this.grossWage / this.TWD) * (this.TWD -
this.LOP)) - (this.basicWage() + this.HRA()
                + this.coveyanceAllowance() +
this.medicalAllowance());
    }

    public double EPF() {
        if (this.basicWage() > 15000) {
            return 15000 * 0.12;
        } else {
            return this.basicWage() * 0.15;
        }
    }

    public double totalEarnings() {
        return this.basicWage() + this.HRA() +
this.coveyanceAllowance() + this.medicalAllowance()
                + this.otherAllowance();
    }

    public double ESI() {
```

```
        if (this.basicWage() < 21000) {
            return this.totalEarnings() * 0.0075;
        } else {
            return 0.0;
        }
    }

    public double totalDeductions() {
        return this.EPF() + this.ESI() +
this.professionalTax() + this.loanRecovery();
    }

    public double netSalary() {
        return this.totalEarnings() - this.totalDeductions()
+ this.bonus();
    }

    public String salaryReport() {
        return (
            "\t\tSIT, Pune\n" +
            "\t\tLavale\n" +
            "\t\tPay Slip for April, 2023\n" +
            "Name:                \t" + this.name + "\n" +
            "Employee ID:         \t" + this.EID + "\n" +
            "Designation:         \t" + this.designation +
"\n" +
            "Department:          \t" + this.department +
"\n" +
            "DOJ:                 \t" + this.DOJ + "\n" +
            "Gross Wage:          \t" + this.grossWage +
"\n" +
            "Total Working Days:  \t" + this.TWD + "\n" +
            "LOP Days:            \t" + this.LOP + "\n" +
            "Paid Days:           \t" + (this.TWD -
this.LOP) + "\n" +
            "\tEarnings\t\t\tDeductions\n" +
            "Basic Wage:          \t" + this.basicWage() +
"\t" + "EPF:             \t" + this.EPF() + "\n" +
```

```
            "HRA:                   \t" + this.HRA() + "\t" +
"ESI:               \t" + this.ESI() + "\n" +
            "Conveyance Allowance:\t" +
this.coveyanceAllowance() + "\t" + "Professional Tax:\t" +
this.professionalTax() + "\n" +
            "Medical Allowance:    \t" +
this.medicalAllowance() + "\t" + "Loan Recovery:    \t" +
this.loanRecovery() + "\n" +
            "Other Allowances:     \t" +
this.otherAllowance() + "\t" +
            "Total Earnings:       \t" + this.totalEarnings()
+ "\t" + "Total Deductions:\t" + this.totalDeductions() +
"\n" +
            "Net Salary:           \t" + this.netSalary() +
"\n"
        );
    }
}
```

BonusEmployee.java

```
package Assn_5;

/*
This is the bonus employee who gets a 69% bonus on the basic
Wage.
*/

public class BonusEmployee extends NormalEmployee {
    public BonusEmployee(
        String name,
        int EID,
        String designation,
        String department,
        String DOJ,
        double grossWage,
        int leavesTaken
    ) {
        super(
```

```
                name,
                EID,
                designation,
                department,
                DOJ,
                grossWage,
                leavesTaken);
    }

    public double bonus() {
        return this.basicWage() * 0.69;
    }
}
```

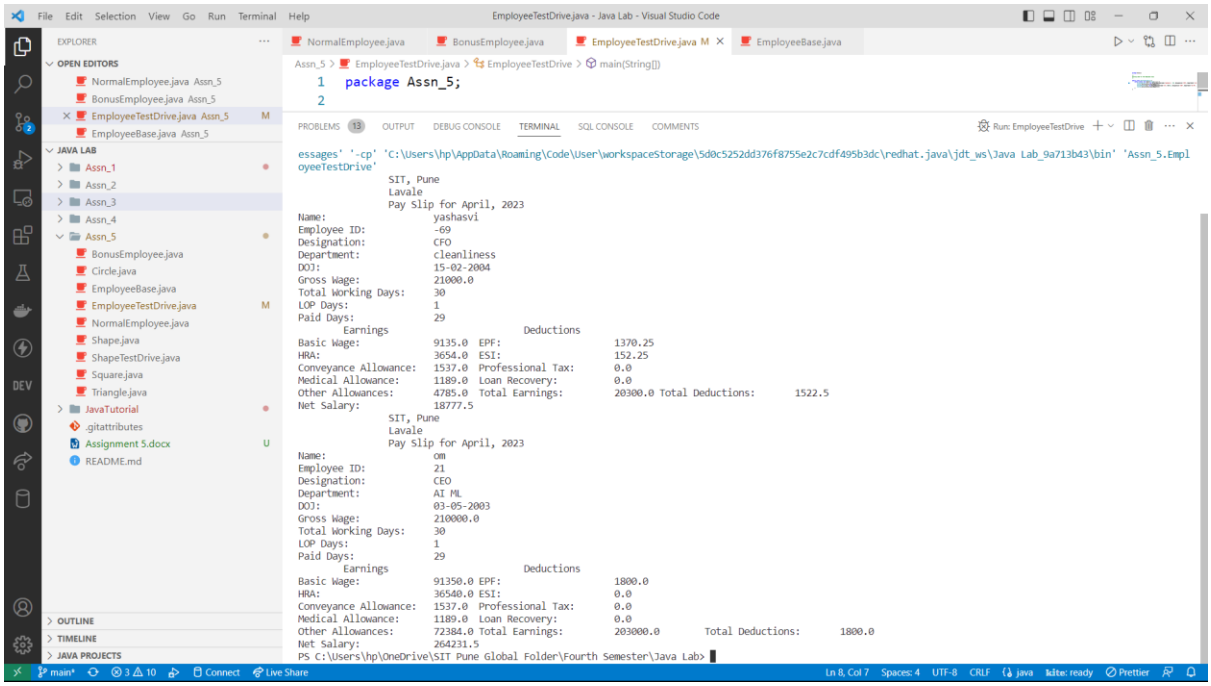
EmployeeTestDrive.java

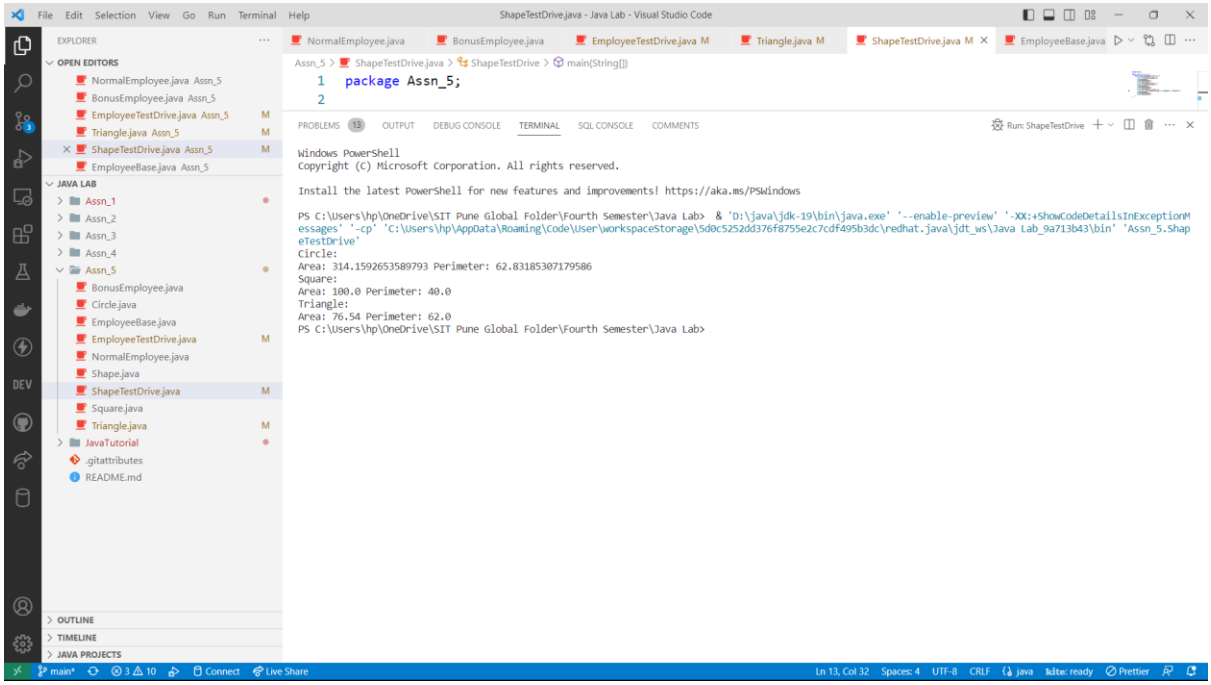
```
package Assn_5;

/*
Testing code for the Employee Class
*/

public class EmployeeTestDrive {
    public static void main(String[] args) {
        NormalEmployee ne = new NormalEmployee("yashasvi", -
69, "janitor", "cleanliness", "15-02-2004", 21000, 0);
        System.out.print(ne.salaryReport());
        BonusEmployee be = new BonusEmployee("om", 21,
"CEO", "AI ML", "03-05-2003", 210000, 20);
        System.out.print(be.salaryReport());
    }
}
```

Outputs


EmployeeTestDrive.java - Java Lab - Visual Studio Code
package Assn_5;
ess' '-cp' 'C:\Users\hp\AppData\Roaming\Code\User\workspaceStorage\5d0c5252dd376f8755e2c7cdf495b3dc\redhat.java\jdt_ws\Java Lab_9a713b43\bin' 'Assn_5.EmployeeTestDrive'
SIT, Pune
Lavale
Pay Slip for April, 2023
Name: yashasvi
Employee ID: -69
Designation: CFO
Department: cleanliness
DOJ: 15-02-2004
Gross Wage: 21000.0
Total Working Days: 30
LOP Days: 1
Paid Days: 29
Earnings Deductions
Basic Wage: 9135.0 EPF: 1370.25
HRA: 3654.0 ESI: 152.25
Conveyance Allowance: 1537.0 Professional Tax: 0.0
Medical Allowance: 1189.0 Loan Recovery: 0.0
Other Allowances: 4785.0 Total Earnings: 20300.0 Total Deductions: 1522.5
Net Salary: 18777.5
SIT, Pune
Lavale
Pay Slip for April, 2023
Name: om
Employee ID: 21
Designation: CEO
Department: AI ML
DOJ: 03-05-2003
Gross Wage: 210000.0
Total Working Days: 30
LOP Days: 1
Paid Days: 29
Earnings Deductions
Basic Wage: 91350.0 EPF: 1800.0
HRA: 36540.0 ESI: 0.0
Conveyance Allowance: 1537.0 Professional Tax: 0.0
Medical Allowance: 1189.0 Loan Recovery: 0.0
Other Allowances: 72384.0 Total Earnings: 203000.0 Total Deductions: 1800.0
Net Salary: 264231.5
PS C:\Users\hp\OneDrive\SIT Pune Global Folder\Fourth Semester\Java Lab>


ShapeTestDrive.java - Java Lab - Visual Studio Code
package Assn_5;
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\Users\hp\OneDrive\SIT Pune Global Folder\Fourth Semester\Java Lab> & 'D:\java\jdk-19\bin\java.exe' '--enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\hp\AppData\Roaming\Code\User\workspaceStorage\5d0c5252dd376f8755e2c7cdf495b3dc\redhat.java\jdt_ws\Java Lab_9a713b43\bin' 'Assn_5.ShapeTestDrive'
Circle:
Area: 314.1592653589793 Perimeter: 62.83185307179586
Square:
Area: 100.0 Perimeter: 40.0
Triangle:
Area: 76.54 Perimeter: 62.0
PS C:\Users\hp\OneDrive\SIT Pune Global Folder\Fourth Semester\Java Lab>