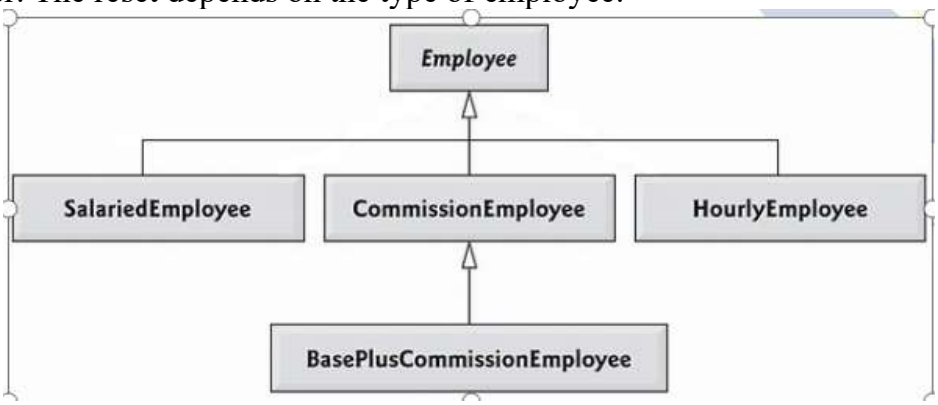
LAB # 08

Task No 01: Create a payroll system using classes, inheritance, and polymorphism. Four types of employees are paid weekly.

a) **Salaried employees:** Fixed salary irrespective of hours.
b) **Hourly employees:** 40 hours salary and overtime (> 40 hours).
c) **Commission employees:** Paid by a percentage of sales.
d) **Base-plus-commission employees:** Base salary and a percentage of sales.

The information about each employee is his/her first name, last name, and national identity card number. The reset depends on the type of employee.



Code:

Main:

```
package lab08task01;

public class Lab08task01 {

    public static void main(String[] args) {

        Employee e1 = new SalariedEmployee("Abdullah", "Sadiq", "42401-0000000-0",
20000);
        Employee e2 = new CommissionEmployee("Abdul", "Wahab", "4200-0000000-0",
20000, 2.58);
        Employee e3 = new BasePlusCommissionEmployee("Ali", "Nasir", "42030-0000000-
0", 15000, 2.3, 80000);
        Employee e4 = new HourlyEmployee("Fahad", "Mustafa", "321-23-2985", 3000,
30);
        System.out.println("First Employee:");
        System.out.println(e1.tostring());
        System.out.println("Salary: " + e1.earnings());
        System.out.println("\nSecond Employee:");
        System.out.println(e2.tostring());
        System.out.println("Salary: " + e2.earnings());
        System.out.println("\nThird Employee:");
        System.out.println(e3.tostring());
        BasePlusCommissionEmployee currentEmployee = (BasePlusCommissionEmployee) e3;
        double oldbasesalary = currentEmployee.getBaseSalary();
        System.out.println("Old Base Salary: " + oldbasesalary);
        currentEmployee.setBaseSalary(1.10 * oldbasesalary);
```

```
        System.out.println("New salary with 10% increase is: " +
currentEmployee.getBaseSalary());
        System.out.println("\nFourth Employee: ");
        System.out.println(e4.tostring());
        System.out.println("Salary: " + e4.earnings());
    }
}
```

Employee (Parent):

```
package lab08task01;

public class Employee {

    private String fName;
    private String lName;
    private String CNIC;

    public Employee() {
        fName = "Not Available";
        lName = "Not Available";
        CNIC = "0";
    }
    public Employee(String fName, String lName, String CNIC) {
        this.fName = fName;
        this.lName = lName;
        this.CNIC = CNIC;
    }
    public String getfName() {
        return fName;
    }
    public void setfName(String fName) {
        this.fName = fName;
    }
    public String getlName() {
        return lName;
    }
    public void setlName(String lName) {
        this.lName = lName;
    }
    public String getCNIC() {
        return CNIC;
    }
    public void setCNIC(String CNIC) {
        this.CNIC = CNIC;
    }
    public String tostring() {
        return fName + " " + lName + " CNIC# " + CNIC;
    }
    public double earnings() {
        return 0.00;
    }
}
```

SalariedEmployee (Child):

```
package lab08task01;

public class SalariedEmployee extends Employee {
```

```
    private double weeklysalary;

    public SalariedEmployee() {
        super();
        this.weeklysalary = 0;
    }
    public SalariedEmployee(String fName, String lName, String CNIC, double
weeklysalary) {
        super(fName, lName, CNIC);
        this.weeklysalary = weeklysalary;
    }
    public double getWeeklysalary() {
        return weeklysalary;
    }
    public void setWeeklysalary(double weeklysalary) {
        if (weeklysalary < 0) {
            System.out.println("Weekly Salary cannot be negative");
        } else {
            this.weeklysalary = weeklysalary;
        }
    }
    @Override
    public String tostring() {
        return "Salaried Employee: " + super.tostring();
    }
    @Override
    public double earnings() {
        return weeklysalary;
    }
}
```

CommissionEmployee (Child):

```
package lab08task01;

public class CommissionEmployee extends Employee {

    private double grossSales;
    private double commissionRate;

    public CommissionEmployee() {
        super();
        this.commissionRate = 0;
        this.grossSales = 0;
    }
    public CommissionEmployee(String fName, String lName, String CNIC, double
grossSales,
            double commissionRate) {
        super(fName, lName, CNIC);
        this.commissionRate = commissionRate;
        this.grossSales = grossSales;
    }
    public double getGrossSales() {
        return grossSales;
    }
    public void setGrossSales(double grossSales) {
```

```
        if (grossSales < 0) {
            System.out.println("Gross Sales cannot be negative");
        } else {
            this.grossSales = grossSales;
        }
    }
    public double getCommissionRate() {
        return commissionRate;
    }
    public void setCommissionRate(double commissionRate) {
        if (commissionRate < 0) {
            System.out.println("Commision Rate cannot be negative");
        } else {
            this.commissionRate = commissionRate;
        }
    }
    @Override
    public String tostring() {
        return "Commission Employee: " + super.tostring();
    }
    @Override
    public double earnings() {
        return grossSales * commissionRate;
    }
}
```

BasePlusCommissionEmployee (Child):

```
package lab08task01;

public class BasePlusCommissionEmployee extends CommissionEmployee {

    private double baseSalary;

    public BasePlusCommissionEmployee() {
        super();
        this.baseSalary = 0;
    }
    public BasePlusCommissionEmployee(String fName, String lName, String CNIC, double
grossSales, double commissionRate, double baseSalary) {
        super(fName, lName, CNIC, grossSales, commissionRate);
        this.baseSalary = baseSalary;
    }
    public double getBaseSalary() {
        return baseSalary;
    }
    public void setBaseSalary(double baseSalary) {
        if (baseSalary < 0) {
            System.out.println("Base Salary cannot be negative");
        } else {
            this.baseSalary = baseSalary;
        }
    }
    @Override
    public String tostring() {
        return "Base plus " + super.tostring();
    }
```

```
    @Override
    public double earnings() {
        return baseSalary * super.earnings();
    }
}
```

Output:

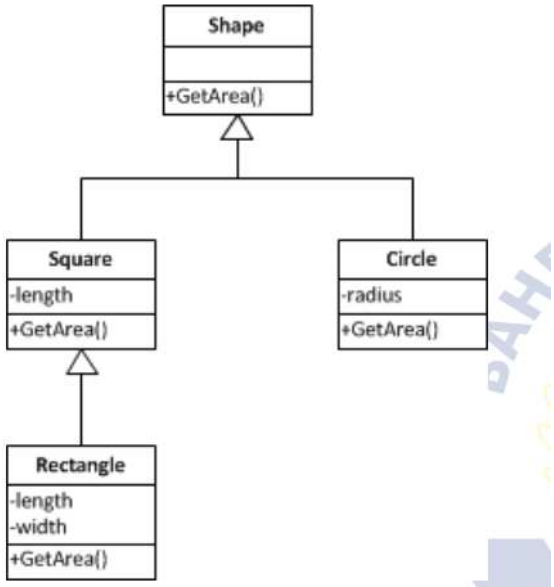
```
--- exec-maven-plugin:3.1.0:exec (default-cli) @ Lab08task01 ---
First Employee:
Salaried Employee: Abdullah Sadiq CNIC# 42401-0000000-0
Salary: 20000.0

Second Employee:
Commission Employee: Abdul Wahab CNIC# 4200-0000000-0
Salary: 51600.0

Third Employee:
Base plus Commission Employee: Ali Nasir CNIC# 42030-0000000-0
Old Base Salary: 80000.0
New salary with 10% increase is: 88000.0

Fourth Employee:
Hourly Employee: Fahad Mustafa CNIC# 321-23-2985
Salary: 90000.0
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
```

Task No 02: You must implement the following diagram including some attributes and other functions:



Code:

Main:

```
package lab08task02;

public class Lab08task02 {

    public static void main(String[] args) {

        Shape s1 = new Square(15);
        s1.getArea();
        Shape s2 = new Rectangle(35, 15);
        s2.getArea();
        Shape s3 = new Circle(23.5);
        s3.getArea();
    }
}
```

Shape (Parent):

```
package lab08task02;

public class Shape {

    public void getArea() {
        System.out.println("Hello Shape!");
    }
}
```

Circle (Child):

```
package lab08task02;

public class Circle extends Shape {

    private double radius, pi = 3.142;

    Circle() {
        radius = 0;
    }
    Circle(double radius) {
        this.radius = radius;
    }
    public void getArea() {
        System.out.println("\nArea of the circle is:" + pi * radius * radius + "
meters square");
    }
}
```

Square (Child):

```
package lab08task02;

public class Square extends Shape {

    private double length;

    public Square() {
        length = 0;
    }
    public Square(double length) {
```

```
        this.length = length;
    }
    public double getLength() {
        return length;
    }
    public void setLength(double length) {
        this.length = length;
    }
    public void getArea() {
        System.out.println("Area of Square is:" + length * length + " meter square");
    }
}
```

Rectangle (Child):

```
package lab08task02;

public class Rectangle extends Square{

    private double width;

    Rectangle() {
        super();
        width = 0;
    }
    Rectangle(double length, double width) {
        super(length);
        this.width = width;
    }
    public double getWidth() {
        return width;
    }
    public void setWidth(double width) {
        this.width = width;
    }
    public void getArea() {
        System.out.println("\nArea of Rectangle is:" + getLength() * getWidth() + "
meters square");
    }
}
```

Output:

```
--- exec-maven-plugin:3.1.0:exec (default-cli) @ Lab08task02 ---
Area of Square is:225.0 meter square

Area of Rectangle is:525.0 meters square

Area of the circle is:1735.1695 meters square
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
```