Exercise 3

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Aim:

The aim of this Java application is to create an employee management system for an academic institution. It models employee details and salary calculations, including various allowances and deductions, and generates pay slips for different types of employees like Programmers, Assistant Professors, Associate Professors, and Professors.

Algorithm:

1. Employee.java

    a. Define Employee Class:

        i. Declare EmployeeName, EmployeeID, EmployeeAddress, EmployeeMailId, and EmployeeMobileNo as member variables.

    b. Constructor Initialization:

        i. Create a constructor that takes EmployeeID, EmployeeName, EmployeeAddress, EmployeeMailId, and EmployeeMobileNo as parameters.

        ii. Initialize the member variables with the constructor parameters.

2. Emp_children.java

    a. Define Inherited Classes:

        i. Create Programmer, Assistant_Professor, Associate_Professor, and Professor classes extending Employee.

    b. Declare Salary Components:

        i. Declare basicPay, DA, HRA, PF, staffClubFund, grossSalary, and netSalary as member variables in each class.

    c. Constructor Initialization:

     i. Create a constructor for each class that takes employee details and basicPay as parameters.

     ii. Use super to call the Employee constructor.

     iii. Initialize basicPay and calculate:

         1. DA as 97% of basicPay.

         2. HRA as 10% of basicPay.

         3. PF as 12% of basicPay.

         4. staffClubFund as 0.1% of basicPay.

         5. grossSalary as the sum of basicPay, DA, and HRA.

         6. netSalary as basicPay minus PF and staffClubFund.

d. Generate Pay Slip:

     i. Define generatePaySlip method to print employee details and salary components.

e. Repeat for Each Class:

     i. Repeat steps 1-4 for Programmer, Assistant_Professor, Associate_Professor, and Professor classes.

3. Main_program.java

     i. Initialize Scanner:

         1. Create a Scanner object to read input.

     ii. Prompt User for Employee Details:

         1. Read and store EmployeeName, EmployeeID, EmployeeAddress, EmployeeMailId, EmployeeMobileNo, and basicPay from user input.

     iii. Select Employee Type:

         1. Display options for employee types: Programmer, Assistant Professor, Associate Professor, Professor.

         2. Read the selected employee type from user input.

     iv. Create and Generate Pay Slip:

         1. Use a switch statement to create an object of the selected employee type.

         2. Call generatePaySlip method for the created object to print the pay slip.

v. Close Scanner:

      1. Close the Scanner object.

Code:

1. Employee.java

```java
package Exercise3;

public class Employee {

    String EmployeeName;
    int EmployeeID;
    String EmployeeAddress;
    String EmployeeMailId;
    long EmployeeMobileNo;

    public Employee(int EmployeeID, String EmployeeName, String EmployeeAddress,
String EmployeeMailId, long EmployeeMobileNo) {
        this.EmployeeID = EmployeeID;
        this.EmployeeName = EmployeeName;
        this.EmployeeAddress = EmployeeAddress;
        this.EmployeeMailId = EmployeeMailId;
        this.EmployeeMobileNo = EmployeeMobileNo;
    }
}
```

2. Emp_children.java

```java
package Exercise3;

class Programmer extends Employee{
```

```java
        double basicPay, DA, HRA, PF, staffClubFund, grossSalary, netSalary;

    Programmer(int EmployeeID, String EmployeeName, String EmployeeAddress,
String EmployeeMailId, long EmployeeMobileNo, double basicPay) {
        super(EmployeeID, EmployeeName, EmployeeAddress, EmployeeMailId,
EmployeeMobileNo);
        this.basicPay = basicPay;

        this.DA = 0.97 * basicPay;
        this.HRA = 0.10 * basicPay;
        this.PF = 0.12 * basicPay;
        this.staffClubFund = 0.01 * basicPay;
        this.grossSalary = basicPay + this.DA + this.HRA;
        this.netSalary = basicPay - this.PF - this.staffClubFund;
    }

    public void generatePaySlip(){

        System.out.println("Pay Slip for: " + EmployeeName);
        System.out.println("Employee ID: " + EmployeeID);
        System.out.println("Address: " + EmployeeAddress);
        System.out.println("Email: " + EmployeeMailId);
        System.out.println("Mobile No: " + EmployeeMobileNo);
        System.out.println("Basic Pay: $" + basicPay);
        System.out.println("DA (97% of BP): $" + DA);
        System.out.println("HRA (10% of BP): $" + HRA);
        System.out.println("PF (12% of BP): $" + PF);
        System.out.println("Staff Club Fund (1% of BP): $" + staffClubFund);
        System.out.println("Gross Salary: $" + grossSalary);
        System.out.println("Net Salary: $" + netSalary);
        System.out.println("--------------------------");
    }
}

class Assistant_Professor extends Employee{

    double basicPay, DA, HRA, PF, staffClubFund, grossSalary, netSalary;

    Assistant_Professor(int EmployeeID, String EmployeeName, String
EmployeeAddress, String EmployeeMailId, long EmployeeMobileNo, double
basicPay) {
        super(EmployeeID, EmployeeName, EmployeeAddress, EmployeeMailId,
EmployeeMobileNo);
        this.basicPay = basicPay;
```

```java
        this.DA = 0.97 * basicPay;
        this.HRA = 0.10 * basicPay;
        this.PF = 0.12 * basicPay;
        this.staffClubFund = 0.01 * basicPay;
        this.grossSalary = basicPay + this.DA + this.HRA;
        this.netSalary = basicPay - this.PF - this.staffClubFund;
    }

    public void generatePaySlip(){

        System.out.println("Pay Slip for: " + EmployeeName);
        System.out.println("Employee ID: " + EmployeeID);
        System.out.println("Address: " + EmployeeAddress);
        System.out.println("Email: " + EmployeeMailId);
        System.out.println("Mobile No: " + EmployeeMobileNo);
        System.out.println("Basic Pay: $" + basicPay);
        System.out.println("DA (97% of BP): $" + DA);
        System.out.println("HRA (10% of BP): $" + HRA);
        System.out.println("PF (12% of BP): $" + PF);
        System.out.println("Staff Club Fund (1% of BP): $" + staffClubFund);
        System.out.println("Gross Salary: $" + grossSalary);
        System.out.println("Net Salary: $" + netSalary);
        System.out.println("---------------------------");
    }
}

class Associate_Professor extends Employee{

    double basicPay, DA, HRA, PF, staffClubFund, grossSalary, netSalary;

    Associate_Professor(int EmployeeID, String EmployeeName, String
EmployeeAddress, String EmployeeMailId, long EmployeeMobileNo, double
basicPay) {
        super(EmployeeID, EmployeeName, EmployeeAddress, EmployeeMailId,
EmployeeMobileNo);
        this.basicPay = basicPay;

        this.DA = 0.97 * basicPay;
        this.HRA = 0.10 * basicPay;
        this.PF = 0.12 * basicPay;
        this.staffClubFund = 0.01 * basicPay;
        this.grossSalary = basicPay + this.DA + this.HRA;
        this.netSalary = basicPay - this.PF - this.staffClubFund;
    }

    public void generatePaySlip(){
```

```java
            System.out.println("Pay Slip for: " + EmployeeName);
            System.out.println("Employee ID: " + EmployeeID);
            System.out.println("Address: " + EmployeeAddress);
            System.out.println("Email: " + EmployeeMailId);
            System.out.println("Mobile No: " + EmployeeMobileNo);
            System.out.println("Basic Pay: $" + basicPay);
            System.out.println("DA (97% of BP): $" + DA);
            System.out.println("HRA (10% of BP): $" + HRA);
            System.out.println("PF (12% of BP): $" + PF);
            System.out.println("Staff Club Fund (1% of BP): $" + staffClubFund);
            System.out.println("Gross Salary: $" + grossSalary);
            System.out.println("Net Salary: $" + netSalary);
            System.out.println("---------------------------");
    }
}

class Professor extends Employee{

    double basicPay, DA, HRA, PF, staffClubFund, grossSalary, netSalary;

    Professor(int EmployeeID, String EmployeeName, String EmployeeAddress,
String EmployeeMailId, long EmployeeMobileNo, double basicPay) {
        super(EmployeeID, EmployeeName, EmployeeAddress, EmployeeMailId,
EmployeeMobileNo);
        this.basicPay = basicPay;

        this.DA = 0.97 * basicPay;
        this.HRA = 0.10 * basicPay;
        this.PF = 0.12 * basicPay;
        this.staffClubFund = 0.01 * basicPay;
        this.grossSalary = basicPay + this.DA + this.HRA;
        this.netSalary = basicPay - this.PF - this.staffClubFund;
    }

    public void generatePaySlip(){

        System.out.println("Pay Slip for: " + EmployeeName);
        System.out.println("Employee ID: " + EmployeeID);
        System.out.println("Address: " + EmployeeAddress);
        System.out.println("Email: " + EmployeeMailId);
        System.out.println("Mobile No: " + EmployeeMobileNo);
        System.out.println("Basic Pay: $" + basicPay);
        System.out.println("DA (97% of BP): $" + DA);
        System.out.println("HRA (10% of BP): $" + HRA);
        System.out.println("PF (12% of BP): $" + PF);
```

```java
            System.out.println("Staff Club Fund (1% of BP): $" + staffClubFund);
            System.out.println("Gross Salary: $" + grossSalary);
            System.out.println("Net Salary: $" + netSalary);
            System.out.println("---------------------------");
        }
    }
```

3. Main_program.java

```java
package Exercise3;
import java.util.Scanner;

public class main_program {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the Employee Name: ");
        String empName = scanner.nextLine();

        System.out.print("Enter the Employee ID: ");
        int empId = scanner.nextInt();
        scanner.nextLine();

        System.out.print("Enter the Address: ");
        String address = scanner.nextLine();

        System.out.print("Enter the Mail ID: ");
        String mailId = scanner.nextLine();

        System.out.print("Enter the Mobile No: ");
        long mobileNo = scanner.nextLong();
        scanner.nextLine();

        System.out.print("Enter the Basic Pay: ");
        double basicPay = scanner.nextDouble();

        System.out.println("Enter the type of Employee: ");
        System.out.println("1. Programmer");
        System.out.println("2. Assistant Professor");
        System.out.println("3. Associate Professor");
        System.out.println("4. Professor");
        System.out.print("Enter: ");
        int type = scanner.nextInt();
```

```java
        scanner.nextLine();

        switch (type) {

            case 1:
                Programmer programmer = new Programmer(empId,empName, address,
mailId, mobileNo, basicPay);
                programmer.generatePaySlip();
                break;

            case 2:
                Assistant_Professor assistant_Professor = new
Assistant_Professor(empId,empName, address, mailId, mobileNo, basicPay);
                assistant_Professor.generatePaySlip();
                break;

            case 3:
                Associate_Professor associate_Professor = new Associate_Professor(empId,
empName, address, mailId, mobileNo, basicPay);
                associate_Professor.generatePaySlip();
                break;

            case 4:
                Professor professor = new Professor(empId, empName, address, mailId,
mobileNo, basicPay);
                professor.generatePaySlip();
                break;

            default:
                System.out.println("Invalid type of Employee");
                break;
        }

        scanner.close();
    }
}
```

Output:

```
Enter the Employee Name: Hariesh
Enter the Employee ID: 12345
Enter the Address: something
Enter the Mail ID: smth@gmail.com
Enter the Mobile No: 1234567890
Enter the Basic Pay: 7000
Enter the type of Employee:
1. Programmer
2. Assistant Professor
3. Associate Professor
4. Professor
Enter: 1
Pay Slip for: Hariesh
Employee ID: 12345
Address: something
Email: smth@gmail.com
Mobile No: 1234567890
Basic Pay: $7000.0
DA (97% of BP): $6790.0
HRA (10% of BP): $700.0
PF (12% of BP): $840.0
Staff Club Fund (1% of BP): $70.0
Gross Salary: $14490.0
Net Salary: $6090.0
-----------------------------

Process finished with exit code 0
```

```
Enter the Employee Name: User
Enter the Employee ID: 3442
Enter the Address: adasd
Enter the Mail ID: asdsdasa
Enter the Mobile No: 123233424
Enter the Basic Pay: 12000
Enter the type of Employee:
1. Programmer
2. Assistant Professor
3. Associate Professor
4. Professor
Enter: 3
Pay Slip for: User
Employee ID: 3442
Address: adasd
Email: asdsdasa
Mobile No: 123233424
Basic Pay: $12000.0
DA (97% of BP): $11640.0
HRA (10% of BP): $1200.0
PF (12% of BP): $1440.0
Staff Club Fund (1% of BP): $120.0
Gross Salary: $24840.0
Net Salary: $10440.0
-----------------------------


Process finished with exit code 0
```

Result:

      To develop a Java application, start with an Employee class containing Emp_name, Emp_id, Address, Mail_id, and Mobile_no. Inherit this class into Programmer, AssistantProfessor, AssociateProfessor, and Professor classes, each adding a BasicPay attribute. Calculate salaries where DA is 97% of Basic Pay, HRA is 10%, PF is 12%, and staff club fund is 0.1%. For each employee, compute gross salary (Basic Pay + DA + HRA) and net salary (Gross Salary - PF - Staff Club Fund). Generate payslips displaying the gross and net salary for employees of each class.