ASSIGNMENT 5

Kunal More

1. Design and implement a class named `InstanceCounter` to track and count the number of instances created from this class.

P1. Java

```
package Five.Assignment;

public class p1
                                    {

    public static void main(String a[])
                                    {
        instanceCount obj1 = new instanceCount()
                                    ;
        instanceCount obj2 = new instanceCount()
                                    ;
        instanceCount obj3 = new instanceCount()
                                    ;
        instanceCount obj4 = new instanceCount()
                                    ;
        instanceCount obj5 = new instanceCount()
                                    ;
        instanceCount obj6 = new instanceCount()
                                    ;
        instanceCount obj7 = new instanceCount()
                                    ;
        instanceCount obj8 = new instanceCount()
                                    ;
        instanceCount obj9 = new instanceCount()
                                    ;

        System.out.println("INSTANCES "+
instanceCount.getinstance())     ;

                                    }

                                    }
```

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InstanceCount.java

```
package Five.Assignment;

public class instanceCount
                              {

     public static int instancecount = 0
;
               public instanceCount()
                                   {
                    instancecount++
                                   ;

                                   }

               public static int getinstance()
                                   {
                    return instancecount
                                   ;

                                   }
               public String toString()
                                   {
                    return "Total Instances created : " +
instancecount          ;

                                   }

                                 }
```

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```
3 public class p1
4
5     public static void main(String a[])
6         instanceCount obj1 = new instanceCount()
7         instanceCount obj2 = new instanceCount()
8         instanceCount obj3 = new instanceCount()
9         instanceCount obj4 = new instanceCount()
10        instanceCount obj5 = new instanceCount()
11        instanceCount obj6 = new instanceCount()
12        instanceCount obj7 = new instanceCount()
13        instanceCount obj8 = new instanceCount()
14        instanceCount obj9 = new instanceCount()
15
16        System.out.println("INSTANCES "+ instanceCount.getinsta
17
18
```

Console × Problems Debug Shell

<terminated> p1 (6) [Java Application] C:\Users\ACER\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.2

```
INSTANCES 9
```

2. Design and implement a class named `Logger` to manage logging messages for an application. The class should be implemented as a singleton to ensure that only one instance of the `Logger` exists throughout the application.

P2.java

```
package Five.Assignment;

 class Logger {
     private static Logger loggerInstance = null;
     private String logMessages;
     private Logger() {
     logMessages = "";
     }

     public static Logger getInstance() {
     if (loggerInstance == null) {
     loggerInstance = new Logger();

     }
     return loggerInstance;
     }
```

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```
    public void log(String message) {
    logMessages += message + "\n";
    }
    public String getLog() {
    return logMessages;
    }
    public void clearLog() {
    logMessages = "";
    }
    @Override
    public String toString() {
    return "Logger: " + getLog();
    }
   }
```

Log.java

```
package Five.Assignment;

public class log
                        {
    public static void main(String[] args)
                    {
    Logger logger = Logger.getInstance()
                    ;
    logger.log("Application started.")
                        ;
    logger.log("User logged in.")
                        ;
    logger.log("Error: Database connection failed.")
                    ;
    System.out.println("Current Log: ")
                    ;
    System.out.println(logger.getLog())
                    ;
    logger.clearLog()
                        ;
    System.out.println("Log after clearing: ")
                        ;
```

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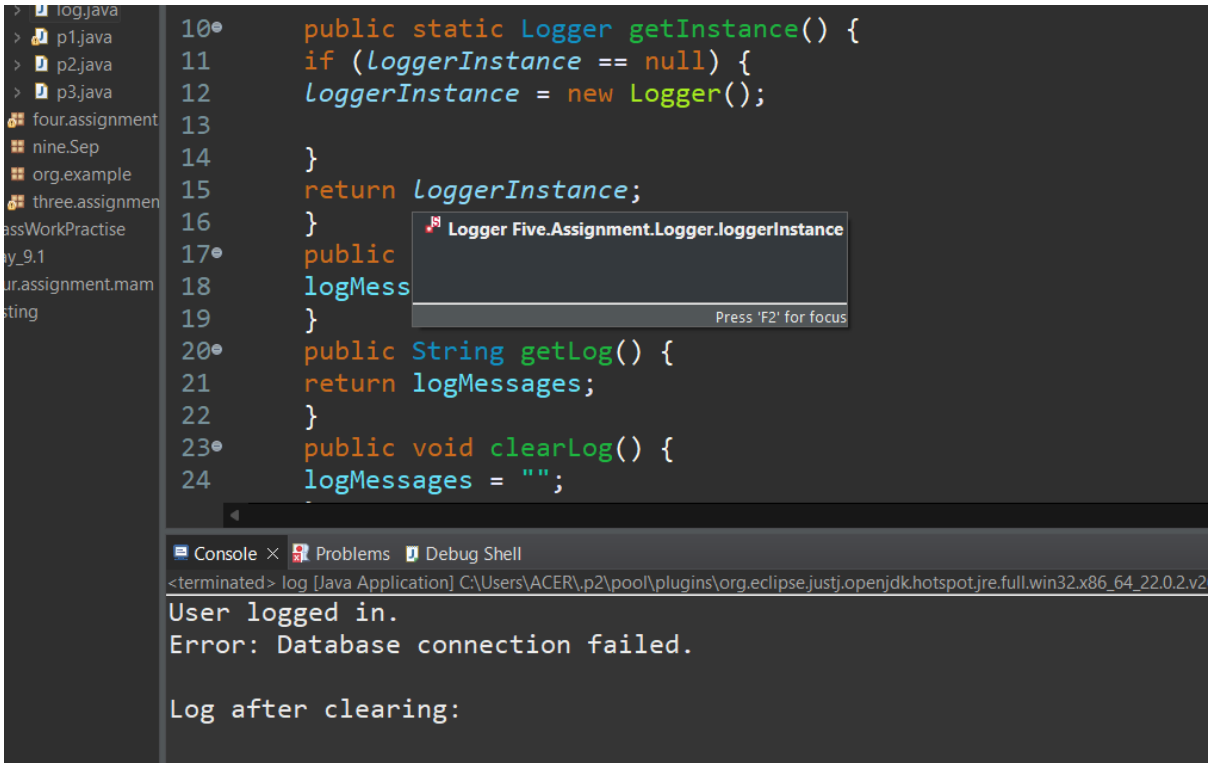
```
        System.out.println(logger.getLog())
                        ;

                                    }

                                    }
```

Output 😊



3. Design and implement a class named `Employee` to manage employee data for a company. The class should include fields to keep track of the total number of employees and the total salary expense, as well as individual employee details such as their ID, name, and salary.

   The class should have methods to:

   - Retrieve the total number of employees (`getTotalEmployees()`)
   - Apply a percentage raise to the salary of all employees (`applyRaise(double percentage)`)
   - Calculate the total salary expense, including any raises (`calculateTotalSalaryExpense()`)
   - Update the salary of an individual employee (`updateSalary(double newSalary)`)

   Understand the problem statement and use static and non-static fields and methods appropriately. Implement static and non-static initializers, constructors, getter and setter methods, and a `toString()` method to handle the initialization and representation of employee data.

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Write a menu-driven program in the `main` method to test the functionalities.

Employee.java

```
package Five.Assignment;

 public class Employee{
      private static int totalEmployees = 0;
      private static double totalSalaryExpense = 0.0;
//   ASSIGNMENT NO.6
      int id;
      private String name;
      private double salary;
      public void Employee(int id, String name, double
salary) {
      this.id = id;
      this.name = name;
      this.salary = salary;
      totalEmployees++;
      totalSalaryExpense += salary;
      }
      public static int getTotalEmployees() {
      return totalEmployees;
      }
      public static double calculateTotalSalaryExpense() {
      return totalSalaryExpense;
      }
      public static void applyRaise(double percentage) {
      totalSalaryExpense += totalSalaryExpense *
(percentage / 100);
      }
      public void updateSalary(double newSalary) {
      totalSalaryExpense -= this.salary;
      this.salary = newSalary;
      totalSalaryExpense += this.salary;
      }

      public String getName() {
      return name;
      }
      public void setName(String name) {
```

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```
      this.name = name;
      }

      public double getSalary() {
      return salary;
      }
      public void setSalary(double salary) {
      this.salary = salary;
//   ASSIGNMENT NO.6
      }

      @Override
      public String toString() {
      return "Employee ID: " + id + ", Name: " + name + ",
Salary: ₹" + salary;
      }
 }
```

Program.java

```
package Five.Assignment;

import java.util.Scanner;

 public class program {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        Employee[] employees = new Employee[100];
        int empCount = 0;

        int choice;
        do {
            System.out.println("\nMenu:");
            System.out.println("1. Add Employee");
            System.out.println("2. Apply Raise to All
Employees");
            System.out.println("3. Update Individual
Employee Salary");
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```
            System.out.println("4. Display Total
Employees");
            System.out.println("5. Display Total Salary
Expense");
            System.out.println("6. Exit");
            System.out.print("Enter your choice: ");
            choice = sc.nextInt();
switch (choice) {
                case 1:

                    System.out.print("Enter Employee ID:
");
                    int id = sc.nextInt();
                    sc.nextLine();
                    System.out.print("Enter Employee Name:
");
                    String name = sc.nextLine();
                    System.out.print("Enter Employee
Salary: ₹");
                    double salary = sc.nextDouble();
                    employees[empCount++] = new
Employee();
                    System.out.println("Employee added
successfully!");
                    break;

                case 2:

                    System.out.print("Enter raise
percentage: ");
                    double raisePercentage =
sc.nextDouble();
                    Employee.applyRaise(raisePercentage);
                    System.out.println("Raise applied to
all employees.");
                    break;

                case 3:

                    System.out.print("Enter Employee ID to
update salary: ");
                    int updateId = sc.nextInt();
```

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```
                    boolean found = false;
                    for (int i = 0; i < empCount; i++) {
                        if (employees[i].id == updateId) {
                            System.out.print("Enter new
salary: ₹");
                            double newSalary =
sc.nextDouble();

employees[i].updateSalary(newSalary);
                            System.out.println("Salary
updated for " + employees[i].getName());
                            found = true;
                            break;
                        }
                    }
                    if (!found) {
                        System.out.println("Employee with
ID " + updateId + " not found.");
                    }
                    break;
case 4:

                    System.out.println("Total Employees: "
+ Employee.getTotalEmployees());
                    break;

                case 5:

                    System.out.println("Total Salary
Expense: ₹" + Employee.calculateTotalSalaryExpense());
                    break;

                case 6:

                    System.out.println("Exiting...");
                    break;

                default:
                    System.out.println("Invalid choice.
Please try again.");
                    break;
            }
```

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```
        } while (choice != 6);

        sc.close();
    }
}
```

OUTPUT 😊