**Assignment 5**

This assignment is designed to practice static fields, static initializers, and static methods.

1. Understand the problem statement and use static and non-static wisely to solve the problem.
2. Use constructors, proper getter/setter methods, and toString() wherever required.
3. Design and implement a class named InstanceCounter to track and count the number of instances created from this class.

**class** InstanceCounter {

**int** num1;

**int** num2;

**private** **static** **int** *count* = 0;

**public** InstanceCounter() {

*count* = *count* + 1;

}

**public** InstanceCounter(**int** i, **int** j) {

*count* = *count* + 1;

}

**public** **int** getNum1() {

**return** num1;

}

**public** **void** setNum1(**int** num1) {

**this**.num1 = num1;

}

**public** **int** getNum2() {

**return** num2;

}

**public** **void** setNum2(**int** num2) {

**this**.num2 = num2;

}

**public** **void** instanceCounter() {

System.***out***.println("Total Instance Created Count : " +*count*);

}

}

**public** **class** ProgramInstanceCounter {

**public** **static** **void** main(String[] args) {

InstanceCounter ic1 = **new** InstanceCounter();

ic1.setNum1(10);

ic1.setNum2(20);

InstanceCounter ic2 = **new** InstanceCounter(30, 40);

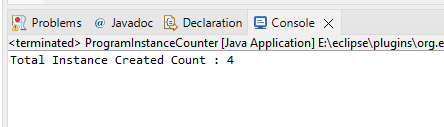
InstanceCounter ic3 = **new** InstanceCounter(50, 60);

**new** InstanceCounter(70, 80);

ic2.instanceCounter();

}

}



1. 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.

The class should include the following methods:

* **getInstance()**: Returns the unique instance of the Logger class.
* **log(String message)**: Adds a log message to the logger.
* **getLog()**: Returns the current log messages as a String.
* **clearLog()**: Clears all log messages.

**Logger**.java:

**package** com.example.domain;

**public** **class** Logger {

**private** **static** Logger *reference*;

**private** String logMessage;

// Static block is created the single instance get created

**static** {

System.***out***.println("Static block to initialize Singlton instance which creates only once..");

*reference* = **new** Logger();

}

**private** Logger() {

logMessage = "";

}

**public** **static** Logger getInstance() {

System.***out***.println("Unique Instance called");

**return** *reference*;

}

**public** **void** log(String message) {

logMessage = logMessage + message +"\n";

}

**public** String getLog() {

**return** logMessage;

}

**public** **void** clearLog() {

logMessage = "";

}

}

LoggerProgram.java :

**package** com.example.name;

**import** com.example.domain.Logger;

**public** **class** Logger\_Program {

**public** **static** **void** main(String[] args) {

Logger l1 = Logger.*getInstance*();

l1.log("Instance l1 is created");

l1.log("This is addition for the l1 instance");

System.***out***.println(l1.getLog());

l1.clearLog();

System.***out***.println("Closing of L1 || the Singlton Instance will not be created again");

Logger l2 = Logger.*getInstance*();

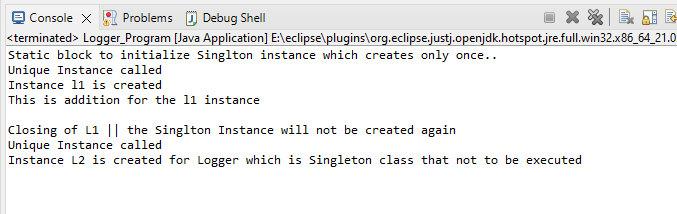
l2.log("Instance L2 is created for Logger which is Singleton class that not to be executed");

System.***out***.println(l2.getLog());

l2.clearLog();

}

}



1. 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.

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

EmployeeMgmt.java :

**package** com.example.domain;

**public** **class** EmployeeMgmt {

**private** **static** **int** *totalEmployees*= 0;

**private** **static** **double** *totalSalaryExpences* = 0;

**private** **int** id;

**private** String name;

**private** **float** salary;

**public** EmployeeMgmt(**int** id, String name, **float** salary) {

**this**.id = id;

**this**.name = name;

**this**.salary = salary;

*totalEmployees* = *totalEmployees* + 1;

*totalSalaryExpences* = *totalSalaryExpences* + salary;

}

**public** **int** getId() {

**return** id;

}

**public** **void** setId(**int** id) {

**this**.id = id;

}

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** **float** getSalary() {

**return** salary;

}

**public** **void** setSalary(**float** newsalary) {

*totalSalaryExpences* = *totalSalaryExpences* - **this**.salary + newsalary;

**this**.salary = newsalary;

}

**public** **static** **int** getTotalEmployees() {

**return** *totalEmployees*;

}

**public** **static** **double** getTotalSalaryExpenses() {

**return** *totalSalaryExpences*;

}

**public** **static** **void** applyRaise(EmployeeMgmt[] empmgmt, **float** percentage) {

**for** (EmployeeMgmt emp : empmgmt) {

**if** (emp != **null**) {

**float** raiseAmount = emp.getSalary() \* (percentage / 100);

emp.setSalary(emp.getSalary() + raiseAmount);

}

}

}

**public** String toString() {

**return** String.*format*("%-10s%-5d%-10.2f", name, id, salary);

}

}

EmpMgmtUtil.java :

**package** com.example.util;

**import** com.example.domain.EmployeeMgmt;

**import** java.util.Scanner;

**public** **class** EmployeeMgmtUtil {

**private** **static** EmployeeMgmt[] *empmgmt* = **new** EmployeeMgmt[2];

**private** **static** **int** *empCount* = 0;

**public** EmployeeMgmtUtil(){

}

**private** **static** Scanner *sc* = **new** Scanner(System.***in***);

**public** **void** acceptRecord() {

*sc*.nextLine();

System.***out***.println("Enter Employee Name");

String name = *sc*.nextLine();

System.***out***.println("Enter Employee Emp id");

**int** empid = *sc*.nextInt();

System.***out***.println("Enter Employee Salary");

**float** salary = *sc*.nextFloat();

*empmgmt*[*empCount*] = **new** EmployeeMgmt(empid, name, salary);

*empCount* = *empCount* + 1;

}

**public** **void** displayEmployees() {

**for** (**int** i = 0; i < *empCount*; i++) {

System.***out***.println(*empmgmt*[i]);

}

System.***out***.println(*empmgmt*.toString());

}

**public** **void** getTotalEmployees() {

System.***out***.println("Total Employees : " + EmployeeMgmt.*getTotalEmployees*());

}

**public** **void** getTotalSalaryExpenses() {

System.***out***.println("Total Salary Expenses : " + EmployeeMgmt.*getTotalSalaryExpenses*());

}

**public** **void** applyRaise() {

System.***out***.println("Enter the raise percentage:");

**float** percentage = *sc*.nextFloat();

EmployeeMgmt.*applyRaise*(*empmgmt*, percentage);

}

**public** **void** calculateTotalSalaryExpense(){

System.***out***.println();

}

**public** **void** updateSalary() {

System.***out***.print("Enter Employee ID to update salary: ");

**int** id = *sc*.nextInt();

EmployeeMgmt emp = *findEmployeeById*(id);

**if** (emp != **null**) {

System.***out***.print("Enter new salary: ");

**float** newsalary = *sc*.nextFloat();

emp.setSalary(newsalary);

System.***out***.println("Salary updated successfully.");

} **else** {

System.***out***.println("Employee not found.");

}

}

**private** **static** EmployeeMgmt findEmployeeById(**int** id) {

**for** (**int** i = 0; i < *empCount*; ++i) {

**if** (*empmgmt*[i].getId() == id) {

**return** *empmgmt*[i];

}

}

**return** **null**;

}

**public** **static** **int** menuList() {

System.***out***.println("\n\n 0. Exit");

System.***out***.println("1. Accept Record");

System.***out***.println("2. Display Employee Details ");

System.***out***.println("3. Retrieve Total number of Employees ");

System.***out***.println("4 .Total Salary Expense ");

System.***out***.println("5. Add Salary Hike ");

System.***out***.println("6. Update the Salary of Employee ");

System.***out***.println("Enter your choise : ");

**return** *sc*.nextInt();

}

}

EmployeeMgmtProgram.java :

**package** com.example.name;

**import** com.example.util.EmployeeMgmtUtil;

**public** **class** EmployeeMgmtProgram {

**public** **static** **void** main(String[] args) {

**int** choise;

EmployeeMgmtUtil util = **new** EmployeeMgmtUtil();

**while**((choise = EmployeeMgmtUtil.*menuList*()) != 0) {

**switch**(choise) {

**case** 1:

util.acceptRecord();

**break**;

**case** 2:

util.displayEmployees();

**break**;

**case** 3:

util.getTotalEmployees();

**break**;

**case** 4:

util.getTotalSalaryExpenses();

**break**;

**case** 5:

util.applyRaise();

**break**;

**case** 6:

util.updateSalary();

**break**;

**default** :

System.***out***.println("Enter the valid choise");

}

}

}

}

