Homework #4

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<u>Introduction:</u>

This project processes employee data from a CSV file and performs various analyses using

Object-Oriented Programming (OOP) principles in Java. The program reads employee records,

organizes them by department, and answers key questions such as finding the lowest-paid

employee in each department, calculating average salaries, identifying long-tenured employees,

and counting department leads.

<u>Code Explanation:</u>

 The Employee Class encapsulates individual employee data, Getter/Setter methods for all

attributes

The Department Class represents the department and manages its employees

- addEmployee(): Adds an employee to the department

  - getAverageSalary(): Calculates average salary for the department

  - getLowestPaidEmployee(): Finds lowest-paid employee in department

  - getLeadCount(): Counts leadership positions in department

  - getLongestTenureEmployees(): Finds employees with longest tenure

 The EmployeeDataProcessor Class handled CSV file processing and implemented all analysis

algorithms, did most of the dirty work here:

- loadEmployeeData(): Reads and parses CSV file

  - findLowestPaidEmployeesByDepartment()

  - findEmployeesWithLessThanFourYears()

  - calculateMarketingAverageSalary()

  - findLongestTenureEmployees()

   - displayDepartmentsWithLeadCount()

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- displayDepartmentsWithAverageSalary()

EmployeeAnalysisMain class is my driver

OOP methods used:

Encapsulation- All class attributes are private with public getter/setter methods

Abstraction- Complex operations hidden behind simple method interfaces

File Reading-The program reads from a CSV file named "employee_data.csv"

Results:

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=== Employee Data Analysis Program ===

Loading employee data from CSV file...
=== Data Summary ===
Total Employees: 44
Total Departments: 4
Departments: Engineering, Finance, HR, Marketing

===  Lowest-Paid Employee by Department ===
Department: Engineering - Ethan Garcia (Salary: $68000.00)
Department: Finance - Liam Murphy (Salary: $62000.00)
Department: HR - Aiden Young (Salary: $55000.00)
Department: Marketing - Abigail Morris (Salary: $60000.00)
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===  Employees with Less Than 4 Years of Service ===
ID: 1, Name: Olivia Watson, Department: Engineering, Salary: $82000.00, Years of Service: 3, Position: Software Engineer
ID: 2, Name: Liam Taylor, Department: Marketing, Salary: $65000.00, Years of Service: 2, Position: Marketing Specialist
ID: 5, Name: Ava Robinson, Department: HR, Salary: $58000.00, Years of Service: 1, Position: HR Specialist
ID: 7, Name: Sophia Lewis, Department: Engineering, Salary: $77000.00, Years of Service: 2, Position: Software Engineer
ID: 10, Name: Liam Murphy, Department: Finance, Salary: $62000.00, Years of Service: 3, Position: Financial Analyst
ID: 12, Name: Ethan Garcia, Department: Engineering, Salary: $68000.00, Years of Service: 1, Position: Junior Software Engi
neer
ID: 13, Name: Abigail Morris, Department: Marketing, Salary: $60000.00, Years of Service: 1, Position: Marketing Coordinato
r
ID: 14, Name: Jackson Fisher, Department: Finance, Salary: $70000.00, Years of Service: 3, Position: Financial Analyst
ID: 16, Name: Aiden Young, Department: HR, Salary: $55000.00, Years of Service: 1, Position: HR Assistant
ID: 18, Name: Lucas Perez, Department: Engineering, Salary: $75000.00, Years of Service: 2, Position: Software Engineer
ID: 19, Name: Scarlett Reyes, Department: Marketing, Salary: $80000.00, Years of Service: 3, Position: Marketing Specialist
ID: 23, Name: Luna Flores, Department: Finance, Salary: $73000.00, Years of Service: 2, Position: Financial Analyst
ID: 24, Name: Logan Allen, Department: Engineering, Salary: $70000.00, Years of Service: 1, Position: Junior Software Engin
eer
ID: 25, Name: Ella Rivera, Department: Marketing, Salary: $62000.00, Years of Service: 1, Position: Marketing Coordinator
ID: 27, Name: Aurora Russell, Department: Engineering, Salary: $80000.00, Years of Service: 3, Position: Software Engineer
ID: 28, Name: Leo Bailey, Department: Marketing, Salary: $68000.00, Years of Service: 2, Position: Marketing Specialist
ID: 31, Name: Penelope Stewart, Department: HR, Salary: $61000.00, Years of Service: 2, Position: HR Specialist
ID: 33, Name: Stella Ward, Department: Engineering, Salary: $73000.00, Years of Service: 1, Position: Junior Software Engin
eer
ID: 34, Name: Gabriel King, Department: Marketing, Salary: $64000.00, Years of Service: 1, Position: Marketing Coordinator
ID: 37, Name: Chloe Hernandez, Department: HR, Salary: $94000.00, Years of Service: 3, Position: HR Manager
ID: 38, Name: Aiden Cooper, Department: Finance, Salary: $71000.00, Years of Service: 2, Position: Financial Analyst
ID: 39, Name: Zoe Hill, Department: Engineering, Salary: $79000.00, Years of Service: 3, Position: Software Engineer
ID: 40, Name: Emma Lee, Department: Marketing, Salary: $72000.00, Years of Service: 2, Position: Marketing Specialist
```

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===  Average Salary in Marketing Department ===
Average salary in Marketing: $69125.00

===  Employee(s) with Longest Tenure ===
Longest tenure: 8 years
ID: 9, Name: Isabella Johnson, Department: Engineering, Salary: $102000.00, Years of Service: 8, Position: Senior Software
Engineer

===  Departments with Lead Count ===
Department: Engineering - Leads: 7
Department: Finance - Leads: 9
Department: HR - Leads: 3
Department: Marketing - Leads: 1

===  Departments with Average Salary ===
Department: Engineering - Average Salary: $87933.33
Department: Finance - Average Salary: $81000.00
Department: HR - Average Salary: $73285.71
Department: Marketing - Average Salary: $69125.00

Analysis completed successfully!
```

References:

The Java Stream API Tutorial | Baeldung

https://www.geeksforgeeks.org/java/collections-in-java-2/

Lesson: Exceptions (The Java™ Tutorials > Essential Java Classes)