

Week 1!

Assignment 3



Employee Management System

You are tasked with designing an Employee Management System for a large multinational corporation. The system should efficiently handle a vast number of employees, their hierarchical structure, departments, and various administrative tasks. The system should be scalable, secure, and provide functionalities for employee management, performance tracking, and organizational analysis.

Features:

1. Employee Management:

- Add new employees with detailed information including name, position, department, salary, and supervisor.
- Remove employees from the system.
- Update employee information such as salary, position, or department.
- Change employee department.
- Promote or demote employees.

2. Hierarchy Management:

- Maintain a hierarchical structure of employees with supervisors and subordinates.
- Allow for dynamic changes in the organizational hierarchy such as promotions, transfers, or terminations.
- Find supervisors and subordinates for a given employee.
- Analyze organizational structure and hierarchy depth.

3. Department Management:

- Create and manage departments within the organization.
- Assign employees to specific departments.
- Handle department-specific tasks such as budget allocation and resource management.

4. Performance Tracking:

- Track employee performance through metrics such as productivity, attendance, and feedback.
- Generate performance reports for individual employees and departments.
- Identify top performers and underperformers within the organization.

5. **Security and Access Control:**

- Implement secure login/authentication mechanisms for employees and administrators.
- Enforce access control to restrict certain functionalities based on user roles.
- Ensure data privacy and integrity by implementing encryption and authorization mechanisms.
- Allow administrators to change login credentials securely.

Classes and Functions:

1. **Employee Class:**

- Attributes: name, ID, position, department, salary, supervisor, subordinates, performance metrics.
- Functions: add_employee(), remove_employee(), update_information(), change_department(), promote(), demote().

2. **Hierarchy Class:**

- Attributes: hierarchical structure of employees and supervisors.
- Functions: build_hierarchy(), update_hierarchy(), find_supervisor(), find_subordinates(), analyze_structure().

3. **Department Class:**

- Attributes: name, ID, manager, employees, budget, resources.
- Functions: create_department(), assign_employee(), manage_budget(), analyze_performance().

4. **PerformanceTracking Class:**

- Attributes: performance metrics, feedback, attendance records.
- Functions: track_performance(), generate_reports(), identify_top_performers().

5. **Security Class:**

- Attributes: user credentials, access control policies, encryption keys.
- Functions: authenticate_user(), enforce_access_control(), encrypt_data(), change_credentials().

Menu Structure:

Main Menu:

1. Employee Management
2. Department Management
3. Performance Tracking
4. Security Settings
5. Exit

Employee Management Menu:

1. Add Employee
2. Remove Employee
3. Update Employee Information
4. Change Department
5. Promote Employee
6. Demote Employee
7. Back to Main Menu

Department Management Menu:

1. Create Department
2. Assign Employee to Department
3. Manage Department Budget
4. Back to Main Menu

Performance Tracking Menu:

1. Track Employee Performance
2. Generate Performance Reports
3. Identify Top Performers
4. Back to Main Menu

Security Settings Menu:

1. Change Credentials
2. Log Out