

JavaFX Human Resource Management and Payroll System

Course Code	COMP2130
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Overview

The HRM and Payroll System is developed to simplify HR operations such as managing employee records, processing payrolls, and generating detailed reports. It offers a user-friendly interface backed by database integration for secure and efficient data handling. The system is structured into several key components:

- The `Main.java` file serves as the entry point of the application, initializing and launching the graphical user interface.
- Navigation between different application pages is managed by `PageController.java`, ensuring a seamless user experience.
- `LoginController.java` handles user authentication, including secure login functionality and role-based access control.
- Employee management operations, such as adding, updating, and deleting records, are managed by `EmployeeController.java`.

- Payroll calculations and the saving of payroll records are handled by ``PayrollController.java``.

Features

- Login: Ensures data security with hashed passwords and role-based access control.
- Employee Management: Provides functionality to add, edit, delete, and view employee records with input validation.
- Payroll Processing: Automates salary calculations, including overtime, bonuses, and tax deductions.
- Reporting: Generates detailed payroll reports for employees and departments.
- Database Integration: Stores all data in a structured SQLite database for reliability and persistence.

Our Approach

1. Design

- Presentation Layer: JavaFX GUIs for intuitive user interaction (e.g., ``login.fxml``, ``payroll.fxml``).
- Business Logic Layer: Centralized utility classes for validation, hashing, and payroll calculations.
- Data Access Layer: Repositories to manage database interactions (``EmployeeRepository``, ``PayrollRepository``).
- Data Models: Classes like ``User``, ``Employee`` and ``Payroll`` represent core entities.

2. Implementation

- Authentication: Implemented a secure login system with password hashing and role-based access for admins and employees.
- Employee Management: Developed input forms with validation for fields like email and phone numbers. Ensured consistent handling of employee data through the use of utility methods.
- Payroll Processing: Built logic for calculating total pay, including overtime and tax deductions, encapsulated in the `Payroll` class. Integrated payroll records into the database for future reference.
- Reporting: Provided functionality to fetch and display payroll and employee data in the reporting section.

3. Testing

- Conducted extensive testing to validate all features, including edge cases for employee and payroll operations.
- Debugged database connectivity issues and ensured smooth navigation between different application pages.

4. Database Integration

- Used SQLite as the database backend to store employee, payroll, and user authentication data.
- Designed structured tables to maintain consistency and ensure efficient data retrieval.

Database Structure

1) `users` Table:

Field	Type	Description
user_id	INTEGER	Primary Key
username	TEXT	Unique username
password	TEXT	Hashed password
role	TEXT	User role (Admin/Employee)

2) `employees` Table:

Field	Type	Description
employee_id	INTEGER	Primary Key
first_name	TEXT	First name
last_name	TEXT	Last name
email	TEXT	Phone number
phone	TEXT	User role (Admin/ Employee)
salary	REAL	Base salary

3) `payroll` Table:

Field	Type	Description
payroll_id	INTEGER	Primary Key
employee_id	TEXT	Foreign Key (employees
base_salary	TEXT	Base salary
hours_worked	TEXT	Hours worked
overtime_hours	TEXT	Overtime hours
bonus	REAL	Bonus amount
tax	REAL	Tax deductions
total_pay	REAL	Final calculated pay
pay_date	TEXT	Date of payroll

System Workflow

1. Login: The user logs in with valid credentials. Admins have access to all features; employees have restricted access.
2. Employee Management: Admins can add, update, or delete employee records as needed.
3. Payroll Processing: Payrolls are calculated based on user inputs like base salary, hours worked, and overtime.
4. Reporting: Payroll and employee data can be reviewed and exported as reports.