Employee Management Application

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System Design

System Architecture

1. Overview
   The system employs a modular architecture utilizing JavaFX for the user interface and Java for backend logic. Key components include Employee Management, Department Management, and Payroll Calculation.

2. Components
   - Employee Management: Facilitates employee addition, modification, and deletion. Supports both full-time and part-time employees.
   - Department Management: Manages organizational departments, providing functionality for addition, modification, and deletion.
   - Payroll Calculation: Computes payroll based on user-input data, including hours worked and employee details.

Database Flow

Data flows between the user interface and backend logic through JavaFX event handling. The Coordinator class serves as the mediator, managing interactions between different components.

User Interface Design

JavaFX is utilized to create a user-friendly interface. The design emphasizes simplicity and intuitiveness, ensuring ease of interaction for users.

Implementation Approach

Technologies Utilized

- **JavaFX**: Employed for building the graphical user interface.
- **Java Serialization**: Utilized for saving and loading data.
- **FXML**: Used for defining the UI layout.

Coding Standards

The code adheres to Java coding standards, emphasizing readability, maintainability, and best coding practices.

Development Methodology

The project followed an iterative and incremental development approach, allowing for continuous testing and improvement. Regular feedback loops facilitated ongoing enhancements.

Key Features

- Employee and Department management functionalities.
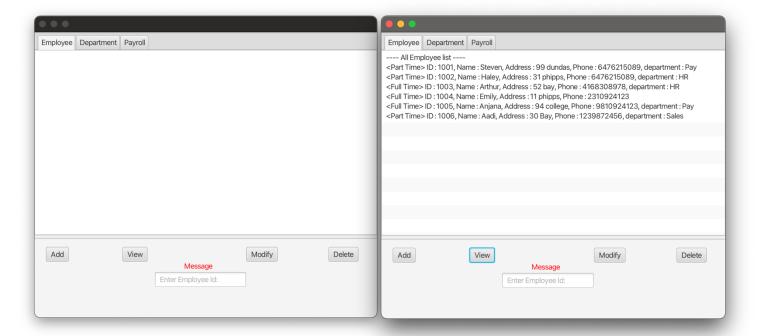- Payroll calculation based on user-input data.

Challenges Encountered

Technical Challenges

- Dynamic UI Updates
    - Issue: Implementing dynamic UI updates based on user actions.
    - Resolution: Employed JavaFX event handling and dynamically updated content.
- Input Validation
    - Issue: Ensuring robust input validation for employee and payroll data.
    - Resolution: Implemented comprehensive checks and alerts to guide users and prevent invalid input.
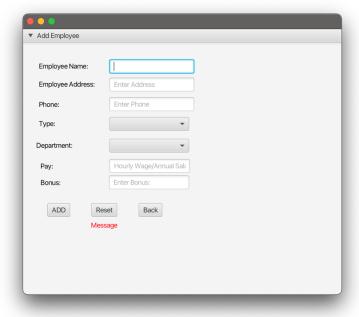
Screenshots Demonstrating the Application

<Employee>

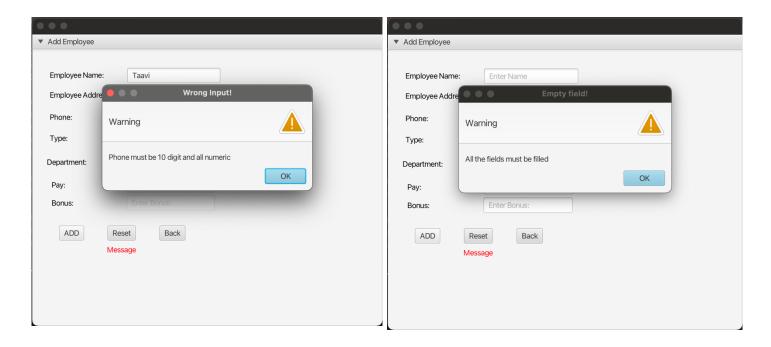(Left screenshot) Default view of employee section.

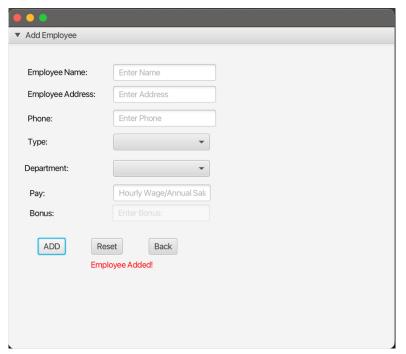(Right screenshot) After user clicks View button. Display all employees.

After user clicks Add button, it opens an 'Add Employee' form.

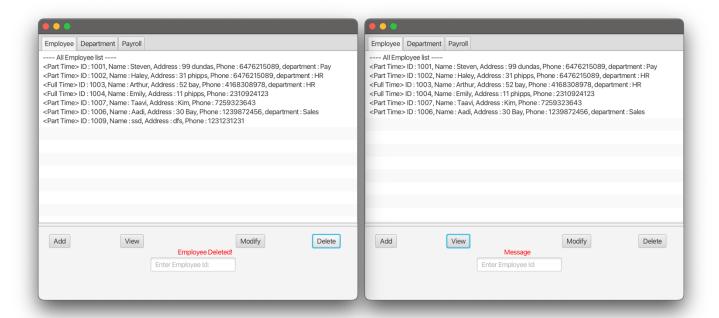If user clicks Reset button, all input in the text field will be cleared.

If user clicks Back button, it goes back to main form.

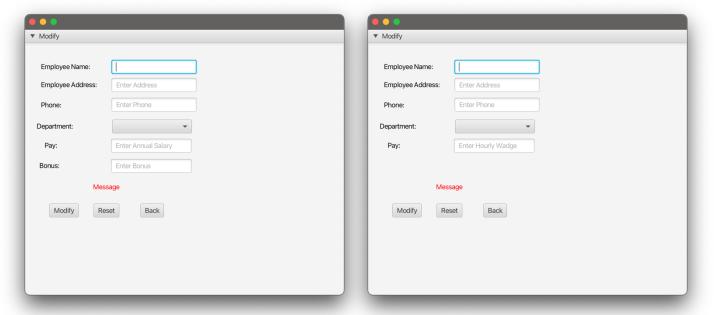Input validation. Warning window is shown if user enters invalid input.

After adding new employee, all text fields become empty automatically and message 'Employee Added!' is shown.
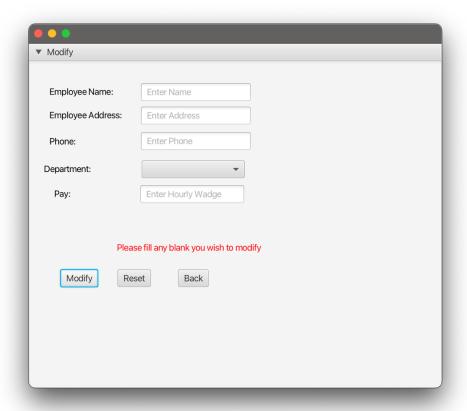
(Left screenshot) Employee being deleted. After user enters valid Employee ID, and clicks Delete button, message 'Employee Deleted!' is shown and ID field is cleared automatically.

(Right screenshot) User can see that deleted employee is no longer on the list.
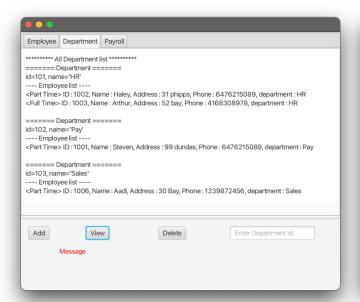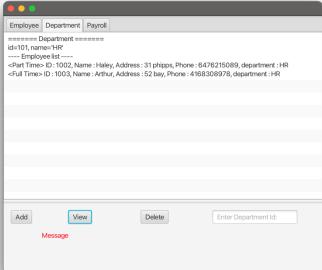

After user clicks Modify button with valid employee ID, it opens 'Modify Employee' form. User will see two versions of forms for Full/Part time. User can use Reset and Back as well.

User is not required to fill out all text fields and they can modify only one piece of information. However, user must enter at least one field to modify employee's information. Otherwise, user will see the validation error message.
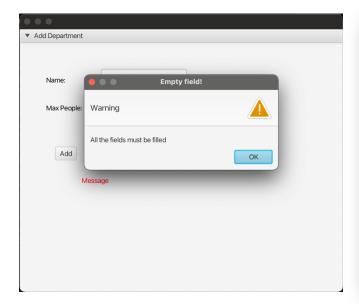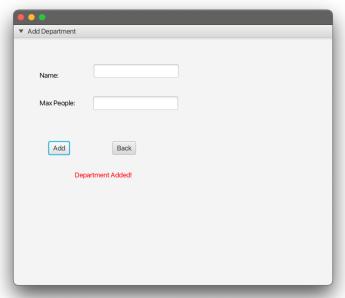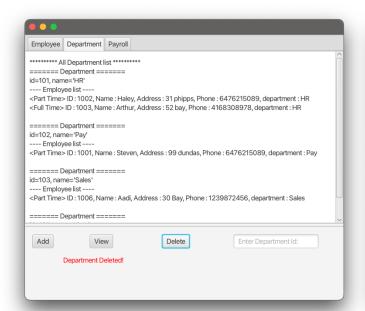
<Department>

(Left screenshot) The list of all departments is shown if user clicks View button without ID.
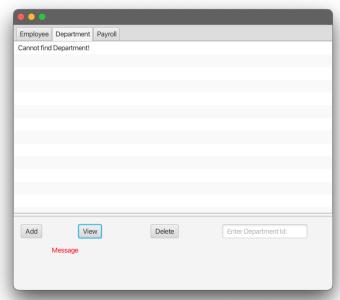
(Right screenshot) Only particular department is shown if user clicks View button with valid department ID, and ID field becomes empty automatically.

After user clicks Add button, it opens 'Add Department' form. Message 'Department Added!' is shown after adding department. Program validates inputs. Back button is also available.
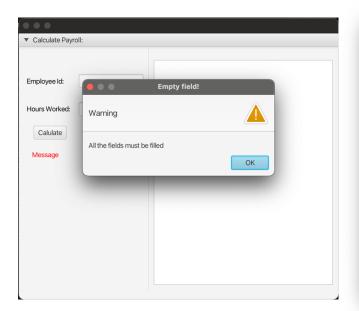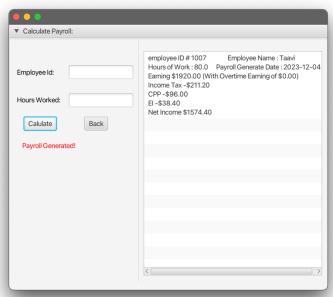
(Left screenshot) Department being deleted. After user enters valid Department ID, and clicks Delete button, message 'Department Deleted!' is shown and ID field becomes empty automatically.
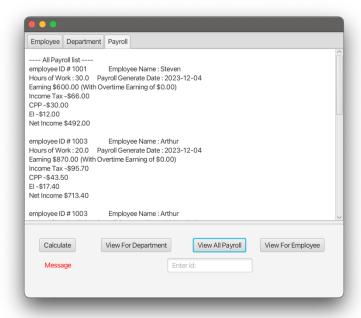
(Right screenshot) Message 'Cannot find Department!' is shown if user enter deleted Department ID. ID field becomes empty automatically as well.
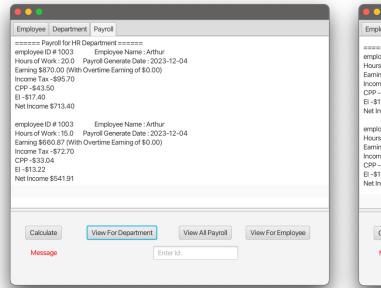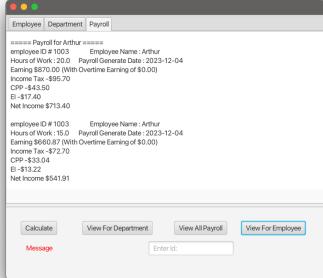
\<Payroll\>

After user clicks Calculate button, it opens 'Calculate Payroll' form. Calculated payroll is shown right side of form, and message 'Payroll Generated!' is shown after user calculates payroll. Program validates inputs. Back button is also available.

User will see list of all payrolls after clicking 'View All Payroll' button.

User can view payroll by department/employee with valid ID. List of Payrolls are shown accordingly, and ID field becomes empty automatically.

<Validation Errors>

Not all error messages are included here as screenshot, however user will see validation message accordingly if user enters invalid input or ID. For example, if a user inputs alphabetical letters into the phone field, which only accept numerical input, they will receive an error message, and etc.