

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.

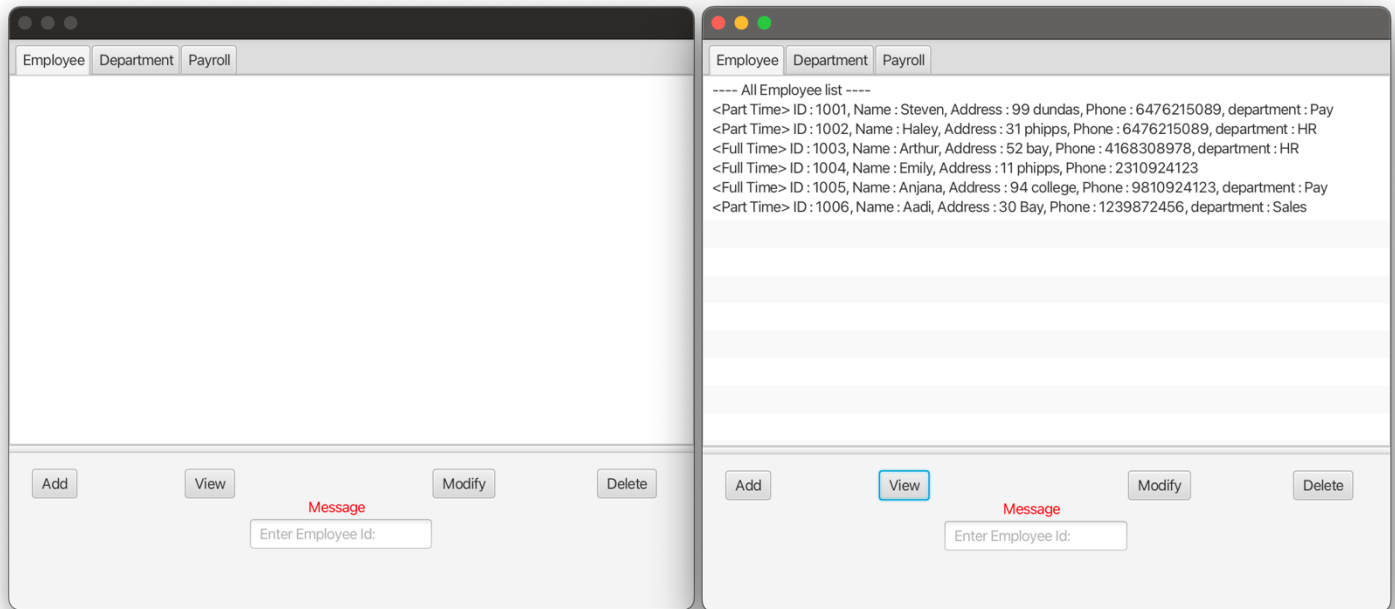
Challenges Encountered

Technical Challenges

- Dynamic UI Updates
 - o Issue: Implementing dynamic UI updates based on user actions.
 - o Resolution: Employed JavaFX event handling and dynamically updated content.
- Input Validation
 - o Issue: Ensuring robust input validation for employee and payroll data.
 - o 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.

The 'Add Employee' form is displayed. It has a title bar with a dropdown arrow and the text 'Add Employee'. The form contains the following fields and controls:

- Employee Name: A text input field.
- Employee Address: A text input field with placeholder text 'Enter Address'.
- Phone: A text input field with placeholder text 'Enter Phone'.
- Type: A dropdown menu.
- Department: A dropdown menu.
- Pay: A text input field with placeholder text 'Hourly Wage/Annual Sal'.
- Bonus: A text input field with placeholder text 'Enter Bonus'.
- Buttons: 'ADD', 'Reset', and 'Back'.
- A 'Message' label is located below the buttons.

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.

2023-12-04

The image shows two side-by-side screenshots of a web application window titled 'Add Employee'. The form contains fields for Employee Name, Employee Address, Phone, Type, Department, Pay, and Bonus. In the left screenshot, the 'Phone' field contains the text 'Taavi', and a warning dialog box titled 'Wrong Input!' is displayed over it. The dialog box contains the text 'Warning' and 'Phone must be 10 digit and all numeric', along with an 'OK' button. In the right screenshot, the 'Employee Name' field is empty, and a warning dialog box titled 'Empty field!' is displayed over it. The dialog box contains the text 'Warning' and 'All the fields must be filled', along with an 'OK' button. Below the form, there are buttons for 'ADD', 'Reset', and 'Back', and a red message 'Message'.

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

The image shows a screenshot of the 'Add Employee' form after a successful submission. The form fields are now empty, and the 'ADD' button is highlighted with a blue border. Below the form, there are buttons for 'Reset' and 'Back', and a red message 'Employee Added!' is displayed.

After adding new employee, all text fields become empty automatically and message 'Employee Added!' is shown.

2023-12-04

The image contains two side-by-side screenshots of a web application window titled 'Employee Department Payroll'. Both windows show a list of employees under the heading '---- All Employee list ----'. The list contains the following entries:

- <Part Time> ID : 1001, Name : Steven, Address : 99 dundas, Phone : 6476215089, department : Pay
- <Part Time> ID : 1002, Name : Haley, Address : 31 phipps, Phone : 6476215089, department : HR
- <Full Time> ID : 1003, Name : Arthur, Address : 52 bay, Phone : 4168308978, department : HR
- <Full Time> ID : 1004, Name : Emily, Address : 11 phipps, Phone : 2310924123
- <Part Time> ID : 1007, Name : Taavi, Address : Kim, Phone : 7259323643
- <Part Time> ID : 1006, Name : Aadi, Address : 30 Bay, Phone : 1239872456, department : Sales
- <Part Time> ID : 1009, Name : ssd, Address : dfs, Phone : 1231231231

At the bottom of each window are buttons for 'Add', 'View', 'Modify', and 'Delete'. Below these buttons is a text input field labeled 'Enter Employee Id:'. In the left screenshot, a red message 'Employee Deleted!' is displayed, and the input field is empty. In the right screenshot, a red message 'Message' is displayed, and the input field is empty.

(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.

The image contains two side-by-side screenshots of a web application window titled 'Modify'. Both windows show a form with the following fields:

- Employee Name:
- Employee Address:
- Phone:
- Department:
- Pay:
- Bonus:

At the bottom of each window are buttons for 'Modify', 'Reset', and 'Back'. Below these buttons is a red message 'Message'. In the left screenshot, the 'Pay' field is labeled 'Enter Annual Salary'. In the right screenshot, the 'Pay' field is labeled 'Enter Hourly Wage'.

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.

The image shows a 'Modify' form window with a title bar containing three colored buttons (red, yellow, green). The form contains the following elements:

- Employee Name:** A text input field with the placeholder text 'Enter Name'.
- Employee Address:** A text input field with the placeholder text 'Enter Address'.
- Phone:** A text input field with the placeholder text 'Enter Phone'.
- Department:** A dropdown menu.
- Pay:** A text input field with the placeholder text 'Enter Hourly Wadge'.
- Validation Message:** A red text message that reads 'Please fill any blank you wish to modify'.
- Action Buttons:** Three buttons at the bottom: 'Modify' (highlighted with a blue border), 'Reset', and 'Back'.

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>

Employee Department Payroll

***** All Department list *****

```

===== Department =====
id=101, name='HR'
---- Employee list ----
<Part Time> ID : 1002, Name : Haley, Address : 31 phipps, Phone : 6476215089, department : HR
<Full Time> ID : 1003, Name : Arthur, Address : 52 bay, Phone : 4168308978, department : HR

===== Department =====
id=102, name='Pay'
---- Employee list ----
<Part Time> ID : 1001, Name : Steven, Address : 99 dundas, Phone : 6476215089, department : Pay

===== Department =====
id=103, name='Sales'
---- Employee list ----
<Part Time> ID : 1006, Name : Aadi, Address : 30 Bay, Phone : 1239872456, department : Sales
  
```

Add View Delete Enter Department Id:

Message

Employee Department Payroll

```

===== Department =====
id=101, name='HR'
---- Employee list ----
<Part Time> ID : 1002, Name : Haley, Address : 31 phipps, Phone : 6476215089, department : HR
<Full Time> ID : 1003, Name : Arthur, Address : 52 bay, Phone : 4168308978, department : HR
  
```

Add View Delete Enter Department Id:

Message

(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.

Add Department

Name: Max People:

Add

Empty field!

Warning

All the fields must be filled

OK

Message

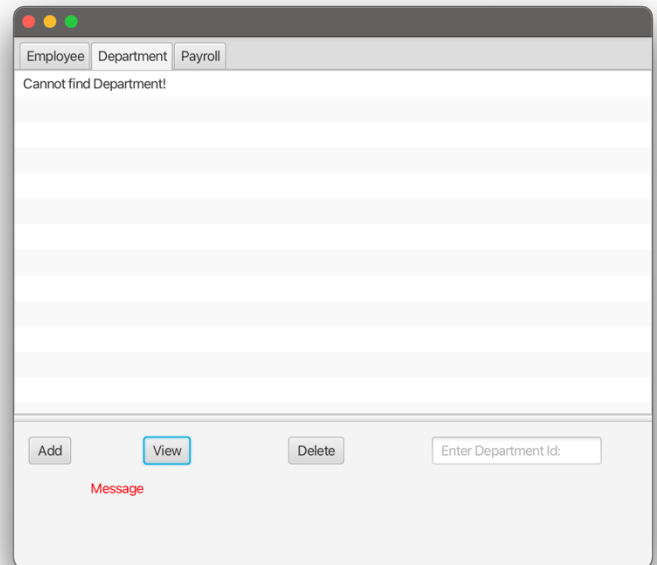
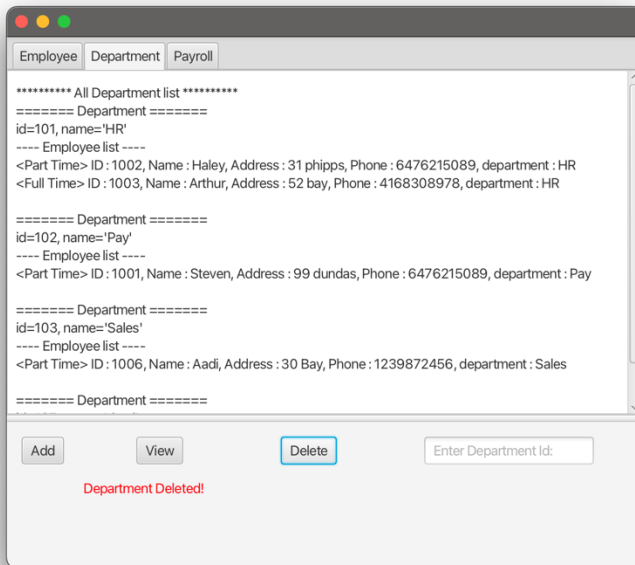
Add Department

Name: Max People:

Add Back

Department Added!

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.

2023-12-04

<Payroll>

The screenshot shows the 'Calculate Payroll' form. It has two input fields: 'Employee Id:' and 'Hours Worked:'. A 'Calculate' button is located below the 'Hours Worked' field. A red 'Message' label is at the bottom left. A modal dialog box is open in the center, titled 'Empty field!', with a warning icon. The message inside says 'Warning' and 'All the fields must be filled'. There is an 'OK' button at the bottom right of the dialog.

The screenshot shows the 'Calculate Payroll' form after calculation. The 'Employee Id:' and 'Hours Worked:' fields are filled. The 'Calculate' button is highlighted in blue. A 'Back' button is to its right. A red 'Payroll Generated!' message is at the bottom left. On the right side, a text area displays the calculated payroll data for employee ID 1007, Taavi, with 80.0 hours worked on 2023-12-04. The data includes earnings of \$1920.00, income tax of \$211.20, CPP of \$96.00, EI of \$38.40, and a net income of \$1574.40.

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.

The screenshot shows the 'View All Payroll' form. It has three tabs: 'Employee', 'Department', and 'Payroll'. The 'Payroll' tab is selected. The form displays a list of all payrolls for two employees: Steven (ID 1001) and Arthur (ID 1003). The list includes details like hours worked, earnings, taxes, and net income. At the bottom, there are four buttons: 'Calculate', 'View For Department', 'View All Payroll' (highlighted in blue), and 'View For Employee'. A red 'Message' label is at the bottom left, and an 'Enter Id:' input field is at the bottom right.

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

2023-12-04

Employee Department Payroll

===== Payroll for HR Department =====

employee ID # 1003 Employee Name : Arthur
Hours of Work : 20.0 Payroll Generate Date : 2023-12-04
Earning \$870.00 (With Overtime Earning of \$0.00)
Income Tax -\$95.70
CPP -\$43.50
EI -\$17.40
Net Income \$713.40

employee ID # 1003 Employee Name : Arthur
Hours of Work : 15.0 Payroll Generate Date : 2023-12-04
Earning \$660.87 (With Overtime Earning of \$0.00)
Income Tax -\$72.70
CPP -\$33.04
EI -\$13.22
Net Income \$541.91

Calculate View For Department View All Payroll View For Employee

Message Enter Id:

Employee Department Payroll

===== Payroll for Arthur =====

employee ID # 1003 Employee Name : Arthur
Hours of Work : 20.0 Payroll Generate Date : 2023-12-04
Earning \$870.00 (With Overtime Earning of \$0.00)
Income Tax -\$95.70
CPP -\$43.50
EI -\$17.40
Net Income \$713.40

employee ID # 1003 Employee Name : Arthur
Hours of Work : 15.0 Payroll Generate Date : 2023-12-04
Earning \$660.87 (With Overtime Earning of \$0.00)
Income Tax -\$72.70
CPP -\$33.04
EI -\$13.22
Net Income \$541.91

Calculate View For Department View All Payroll View For Employee

Message Enter Id:

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.