

**COMP 2130 – Assignment 2**  
**JavaFX Human Resource Management and Payroll System**  
**Project Documentation Group 47**



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Section 103

CRN 15664

## Project Overview

The HRM Payroll System is a comprehensive JavaFX application that allows HR personnel to manage employee records, process payroll, and generate payroll reports. It incorporates object-oriented principles, persistent data storage using Java serialization, and optional advanced features such as attendance tracking and role-based access control.

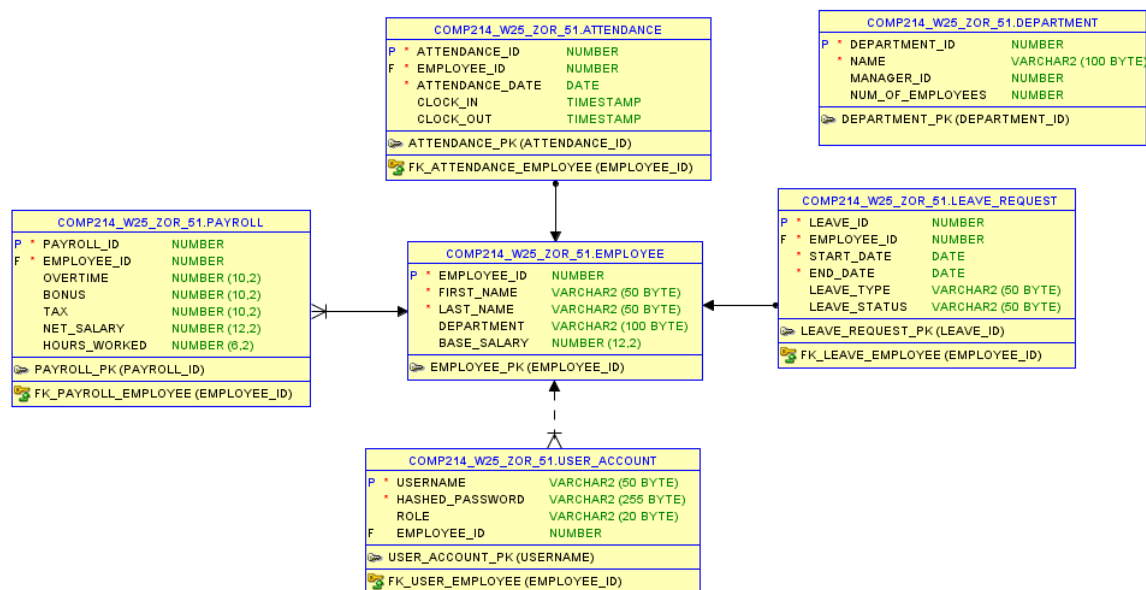
This system consists of 6 modules:

1. Employee Management – Add, view, update, and delete employee records.
2. Payroll Processing – Calculate salaries, taxes, overtime, and bonuses.
3. Employee & Department Reporting – Generate reports for employees and departments.
4. Data Storage – Persistent storage of employee, payroll, attendance, and leave records.
5. Analytics (Visual Diagrams) – Visualize salary distribution, attendance trends, and leave statistics.
6. Attendance & Leave Management – Track employee attendance and leave applications.

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## UML Class Diagram

The UML Diagram represents key classes in the HRM Payroll System and their references. There are 6 main classes: Department, Employee, Attendance, Leave, Payroll, and User. I have explained each class and their references and relationships in detail.



## 1. Department

- Attributes: departmentId, name, managerId, numOfEmployees
- There is a one-to-one relationship managerId → references id
- There is a one-to-many relationship with Employee as each department can have multiple employees.
- managerId is stored as an integer to avoid circular object references and simplify serialization.
- numOfEmployees is maintained as a convenience field for quick reporting

## 2. Employee

- Attributes: id, firstName, lastName, department, baseSalary
- There is a one-to-one relationship department → references name
- There is a one-to-many relationship with Attendance, Leave, and Payroll.
- Department is stored as a string for simplicity in storage.
- Employee serves as the central entity referenced by multiple modules.

## 3. Attendance

- Attributes: employeeId, date, clockIn, clockOut
- There is a one-to-many relationship employeeId → references id
- Department is stored as a string for simplicity in storage.
- Attendance records are linked to employees using employeeId to allow tracking work hours and leave eligibility.

## 4. Leave

- Attributes: employeeId, startDate, endDate, leaveType, leaveStatus
- There is a one-to-many relationship employeeId → references id
- Department is stored as a string for simplicity in storage.
- Leave type and status are stored as strings for flexibility. Enums could be used to enforce strict categories if needed.

## 5. Payroll

- Attributes: employeeId, overtime, bonus, tax, netSalary, hoursWorked
- There is a one-to-one relationship employeeId → references id
- Payroll calculations are stored per employee to allow historical records.
- employeeId links payroll directly to the employee, enabling reporting and analytics.

## 6. User

- Attributes: username, hashedPassword, role, employeeId
- There is a one-to-one relationship employeeId → references id
- Role is defined as an enum to implement role-based access control.
- Users are separate from employees to allow flexibility in authentication and system security.

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### Reference Attributes and Relationship

Class	Attribute	Target Class	Relationship
Department	managerId	Employee	1-to-1
Employee	department	Department	1-to-1
Attendance	employeeId	Employee	Many-to-1
Leave	employeeId	Employee	Many-to-1
Payroll	employeeId	Employee	1-to-1
User	employeeId	Employee	1-to-1

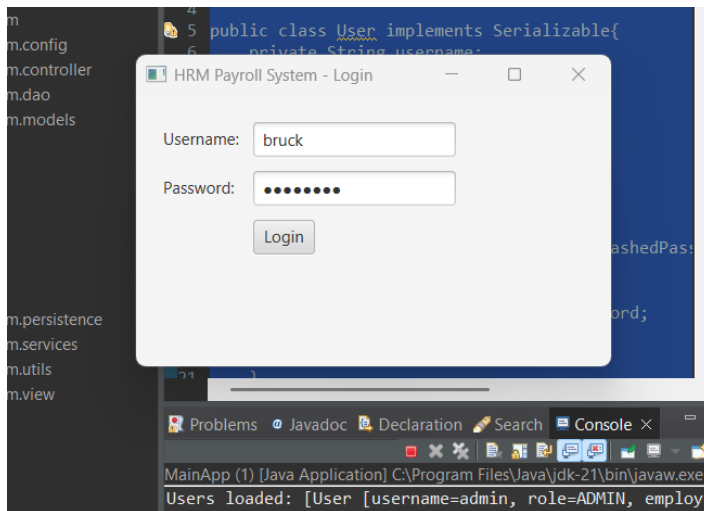
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### UI Screenshots

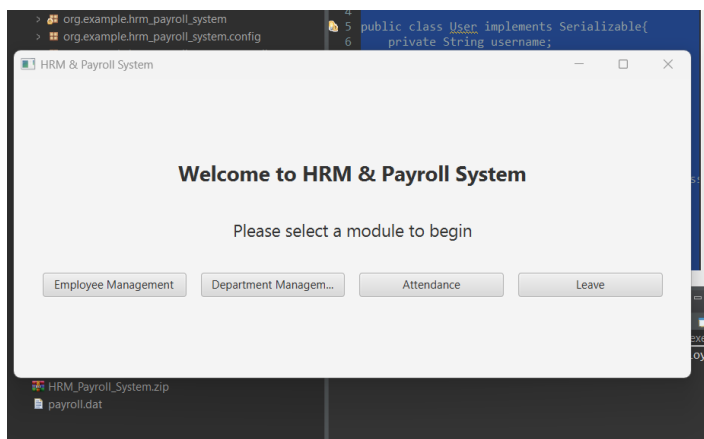
This program has 3 roles : Employee, HR and Admin.

#### Employee

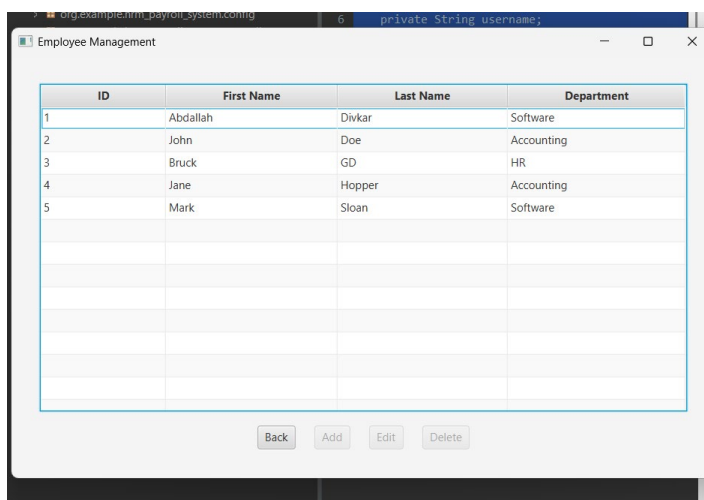
- Can view employee management and payroll information.
- Can clock in/out and apply for leave.
- Access Level: View-only for management modules.



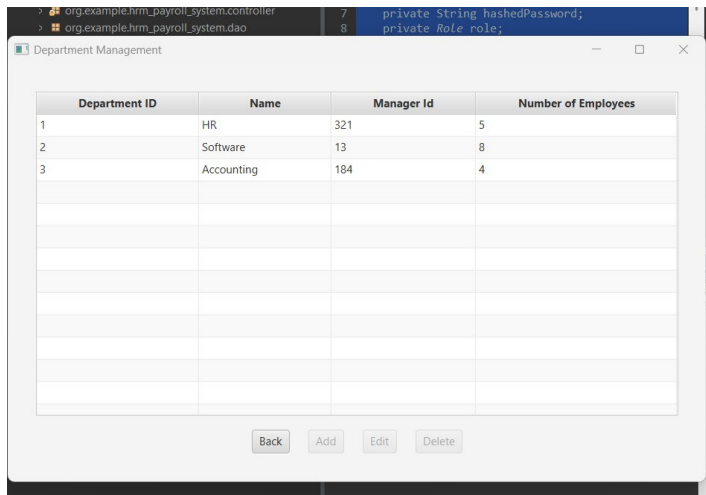
Login Page for Employee/HR/Admin



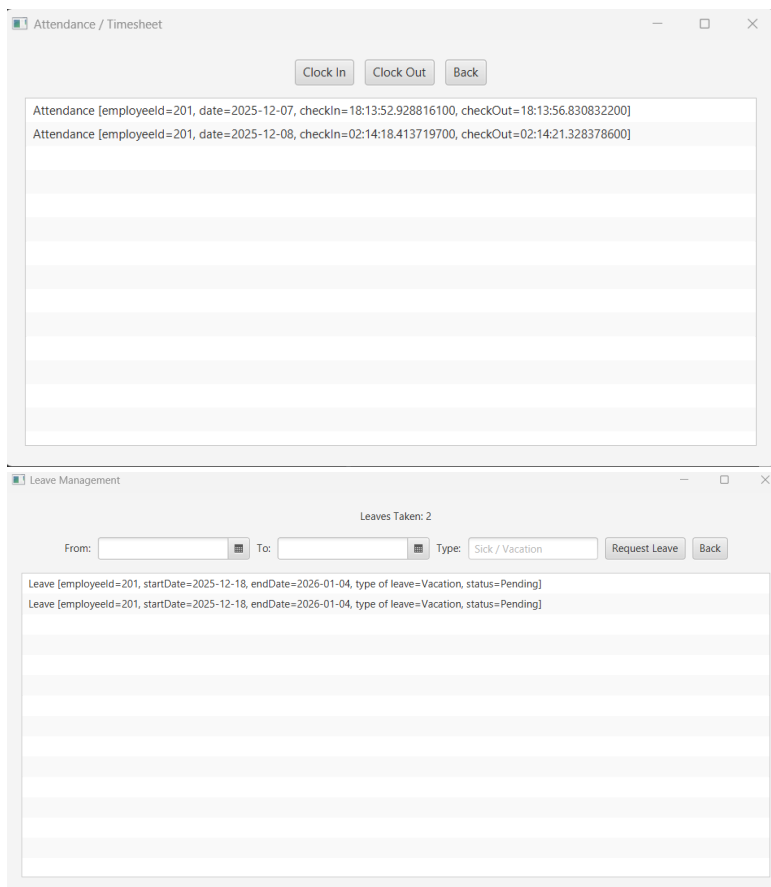
Employee Dashboard: Employee/Department ,Attendance and Leave Module



Employee Management (View Only)



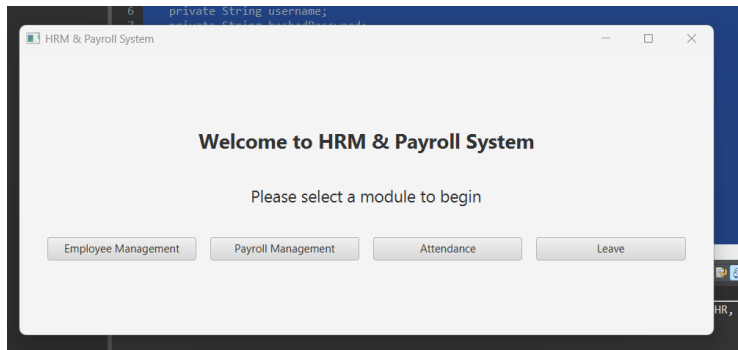
Department Management (View Only)



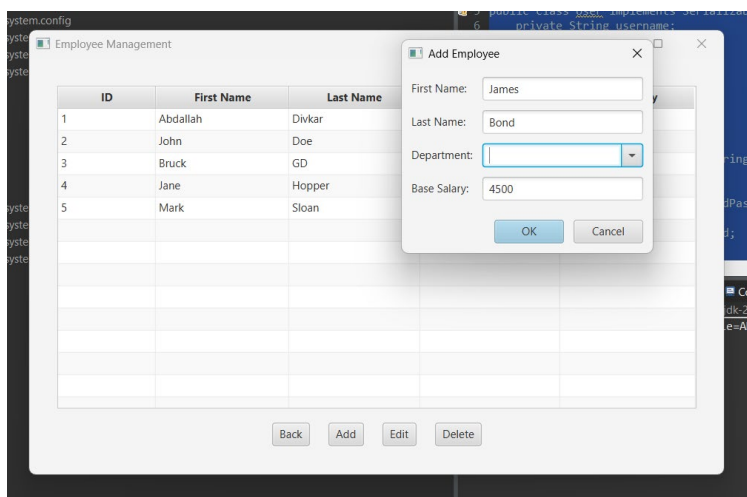
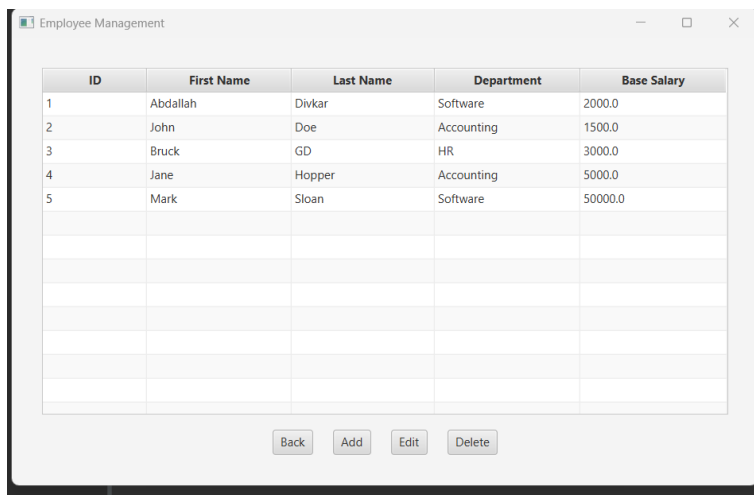
Attendance and Leave

## HR

- Can add, edit, delete records for Employee and Payroll.
- Can approve or reject leave applications.
- Access Level: Full CRUD for Employee and Payroll; partial for Departments.



Dashboard when HR logs in



Employee Management (Full CRUD)

Employee ID	Overtime	Bonus	Tax	Net Salary
2	65.41	1000.0	300.29	1201.17
1	87.21	20000.0	4110.47	16441.86
3	52.33	7000.0	1543.02	6172.1
4	0.0	5000.0	1232.56	4930.23
5	4360.47	10000.0	5313.95	21255.82

Back Add Edit Delete

Payroll Management (Full CRUD)

Leaves Taken: 0

Emp ID:

From:

To:

Type:

Request Leave

Back

Approve

Reject

Leave [employeeld=1, startDate=2025-12-23, endDate=2026-01-01, type of leave=Vacation, status=Approved]

Leave [employeeld=201, startDate=2025-12-18, endDate=2026-01-04, type of leave=Vacation, status=Pending]

Leave [employeeld=201, startDate=2025-12-18, endDate=2026-01-04, type of leave=Vacation, status=Pending]

Attendance / Timesheet

Clock In

Clock Out

Back

Attendance [employeeld=1, date=2025-12-07, checkIn=16:44:36.452057800, checkOut=16:44:59.382453500]

Attendance [employeeld=2, date=2025-12-07, checkIn=16:44:42.684361200, checkOut=16:45:07.125339300]

Attendance [employeeld=3, date=2025-12-07, checkIn=16:44:46.126860500, checkOut=16:45:21.616741]

Attendance [employeeld=4, date=2025-12-07, checkIn=16:44:49.523814900, checkOut=16:45:15.910465200]

Attendance [employeeld=3, date=2025-12-07, checkIn=16:45:10.808441300, checkOut=null]

Attendance [employeeld=201, date=2025-12-07, checkIn=18:13:52.928816100, checkOut=18:13:56.830832200]

Attendance [employeeld=1, date=2025-12-08, checkIn=01:30:57.674707800, checkOut=null]

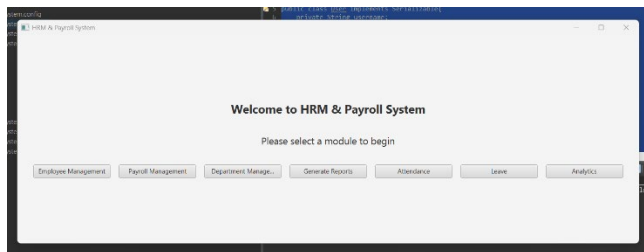
Attendance [employeeld=201, date=2025-12-08, checkIn=02:14:18.413719700, checkOut=02:14:21.328378600]

Attendance and Leave

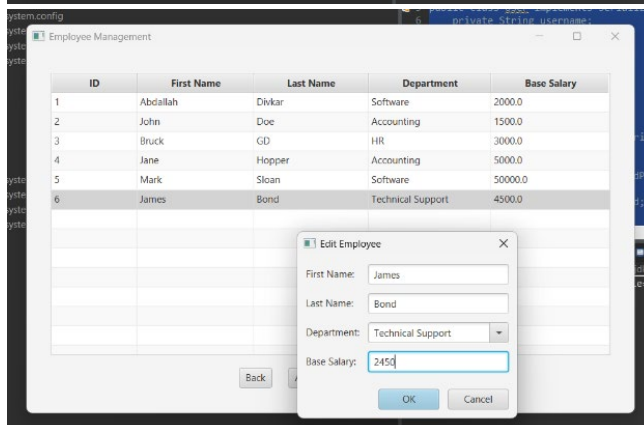
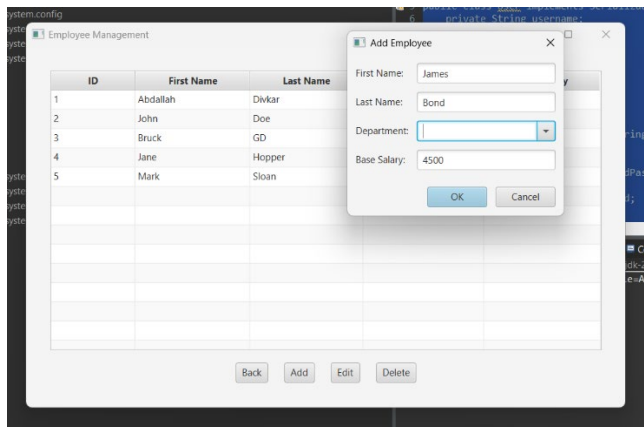


## Admin

- Full access to all modules.
- Can perform CRUD operations on Employee, Payroll, and Departments.
- Can generate reports and view analytics dashboards.
- Access Level: Full CRUD + reporting and analytics.



Dashboard when Admin logs in



Employee Management (FULL CRUD)

The screenshot shows the 'Payroll Management' application window. It contains a table with the following data:

Employee ID	Overtime	Bonus	Tax	Net Salary
2	65.41	1000.0	300.29	1201.17
1	87.21	20000.0	4110.47	16441.86
3	52.33	7000.0	1543.02	6172.1
4	0.0	5000.0	123	
5	4360.47	10000.0	531	

An 'Add Payroll' dialog box is open, allowing users to add new payroll entries. It includes fields for Employee (a dropdown menu), Overtime, Bonus, and Hours Worked, along with OK and Cancel buttons.

## Payroll Management and Processing (FULL CRUD)

The screenshot shows the 'Department Management' application window. It contains a table with the following data:

Department ID	Name	Manager Id	Number of Employees
1	HR	321	5
2	Software	13	8
3	Accounting	184	4

An 'Add Department' dialog box is open, allowing users to add new departments. It includes fields for Department Id, Name, Manager Id, and Number of employees, along with OK and Cancel buttons.

## Department Management (FULL CRUD)

The screenshot shows the 'HRM & Payroll System' login screen. It displays a 'Welcome to HRM & Payroll System' message and a 'Please select a module to begin' prompt. Below the prompt are buttons for 'Emplo...', 'Payroll...', 'Depart...', 'Genera...', 'Attend...', and 'Leave...'. A 'Select Report Type' dialog box is open, showing options for 'Employee Report' and 'Department Report'.

The screenshot shows the 'Department Payroll Report' application window. It displays a 'Generate Department Payroll Report' form with a dropdown menu showing 'Department [departmentId=2, name=Software, managerId=13, numOfEmployees=8]' and a 'Generate Report' button. Below the form, the report content is displayed:

Department Payroll Report: Software

Abdallah DiKar - Net Salary: 16441.86

Mark Sloan - Net Salary: 21255.82

Totals:

Base Salary: 52000.0

Overtime: 4447.68

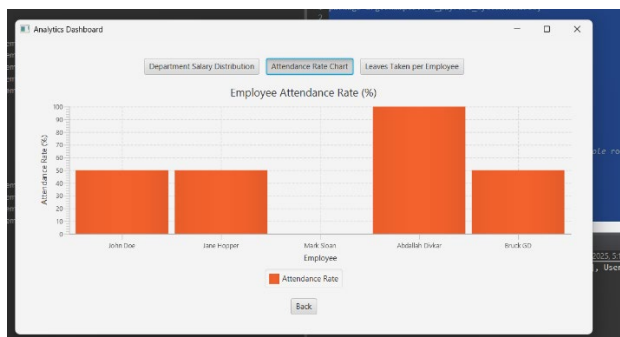
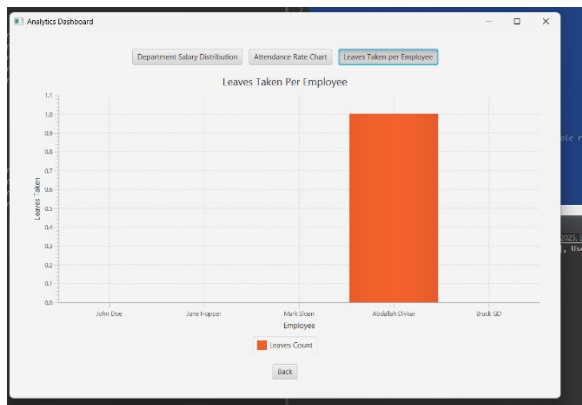
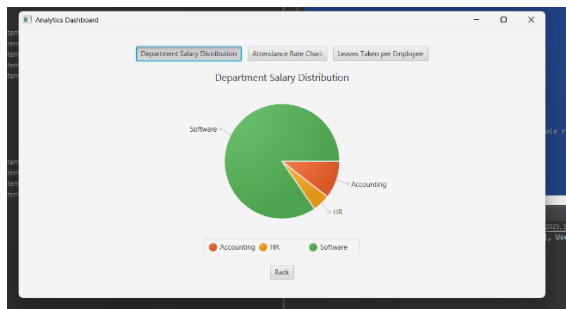
Bonus: 30000.0

Tax: 9424.42

Net Salary: 37697.68

A 'Back' button is located at the bottom of the report area.

## Employee and Department Reporting



Analytics for Department Salary Distribution , Attendance Rate and Employee Leaves

## Reporting & Analytics

- Employee and department payroll reports can be generated on demand.
- Attendance and leave analytics provide insights into work patterns and resource planning.
- Visual diagrams include department salary distribution, attendance rates, and leave statistics.