

# LeaveLog – Your Time Off Management Tool

CS 5004 Final Project

Shuting Gong





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# Goals and Rationale

## Years Ago

- overwhelmed by paper/email requests
- lost in translation
- crippled by incompatible system logic



## Today

- pursuing Computer Science
- my own LeaveLog Web Application
- enabling team/HR to easily manage leaves

# Methods (concepts) and Tools

## Methods (Key concepts)

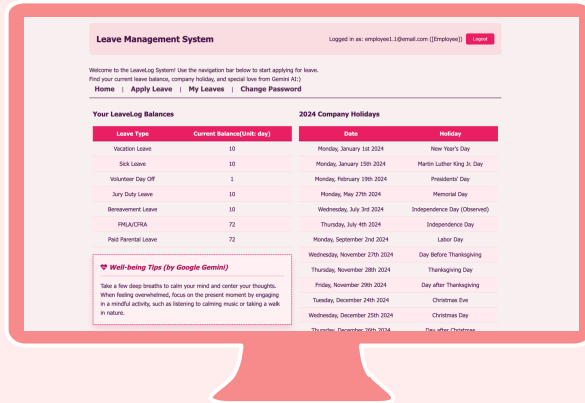
- ✓ Encapsulation
- ✓ Composition over Inheritance
- ✓ Polymorphism
- ✓ Abstraction
- ✓ Class Hierarchies and Dynamic dispatch
- ✓ Single Responsibility Principle
- ✓ MVC Architecture
- ✓ Unit Test
- ✓ Elegant Exception/Error handling
- ✓ And more.....

## Tools

- Backend:
  - Java version21
  - Spring Boot Framework 3.2.4 (embedded with Apache Tomcat as the default servlet container)
  - Spring Boot dependencies
  - Maven 3.9.1
- Database: PostgreSQL 16.2
- Frontend: HTML5, CSS3

# Live Demo

Let's go to <http://localhost:8080/>



## Sample Data curated for demo purpose

CEO (ceo@email.com)

Manager One (manager1@email.com)

Employee OneOne (employee1.1@email.com)

Employee OneTwo (employee1.2@email.com)

Manager Two (manager2@email.com)

Employee TwoOne (employee2.1@email.com)

Employee TwoTwo (employee2.2@email.com)

Manager Three (manager3@email.com)

Employee ThreeOne (employee3.1@email.com)

Manager ThreeOne (manager3.1@email.com)

Employee ThreeOneOne (employee3.1.1@email.com)

Manager Four (manager4@email.com)

Manager FourOne (manager4.1@email.com)

Employee FourOneOne (employee4.1.1@email.com)

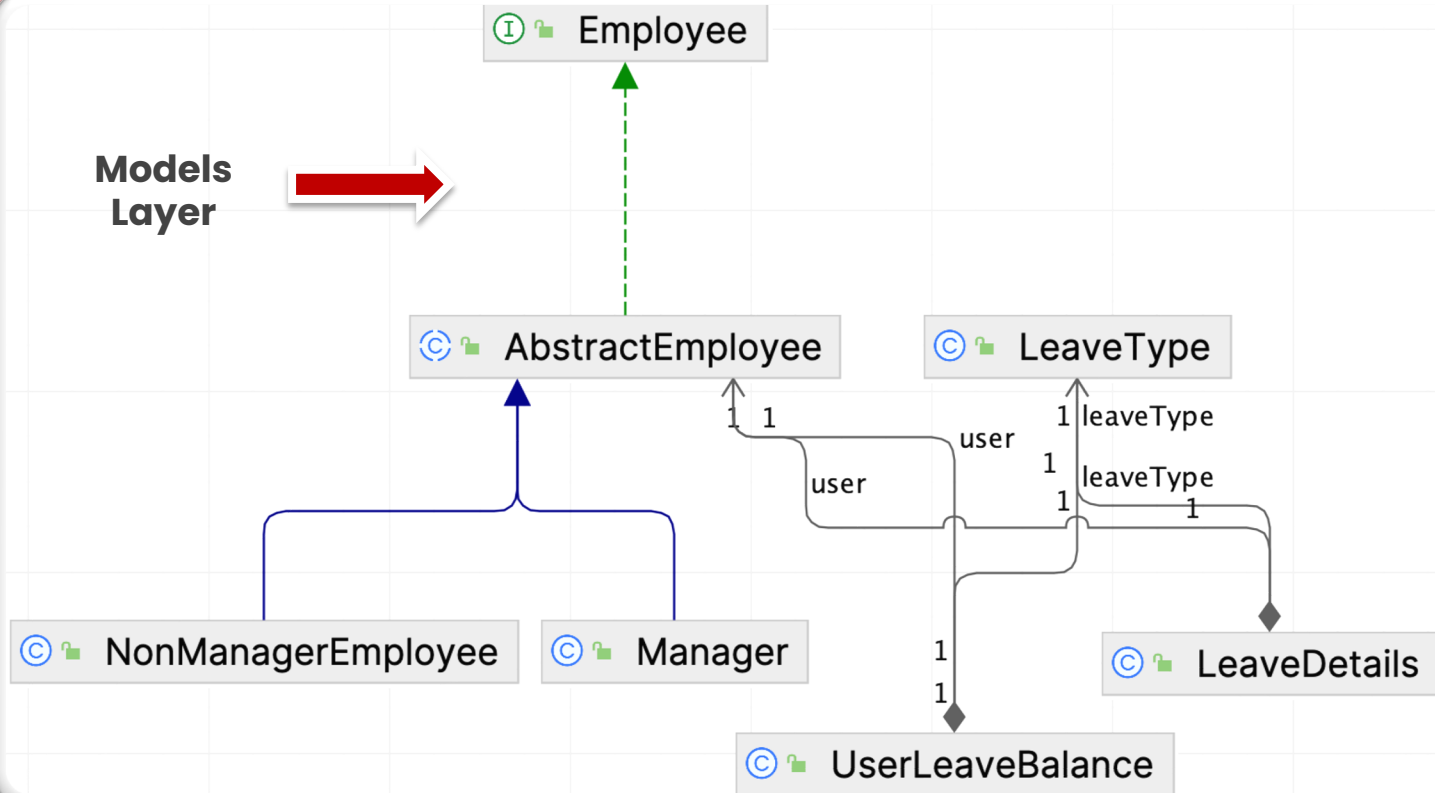
Manager Five (manager5@email.com)

Employee FiveOne (employee5.1@email.com)



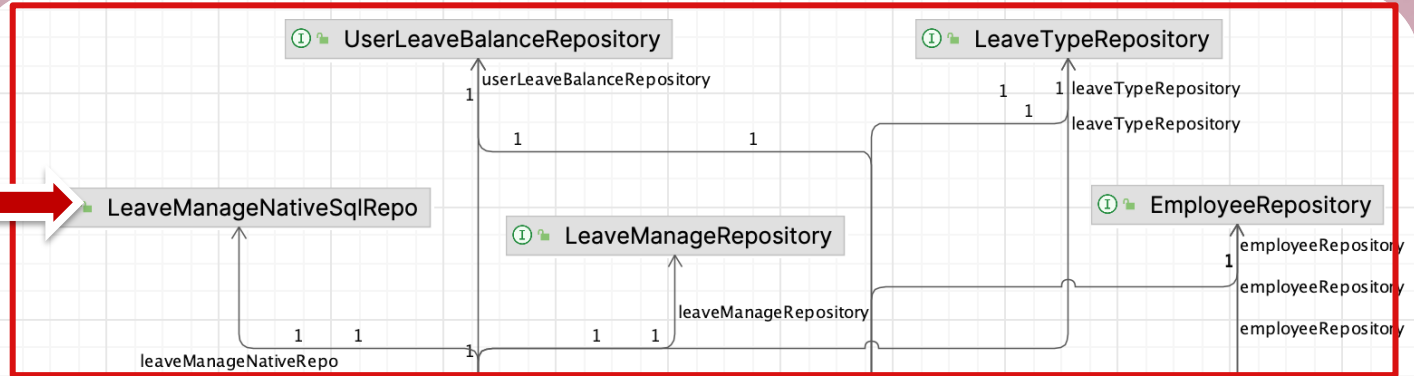
# Class Diagrams-2

Models  
Layer

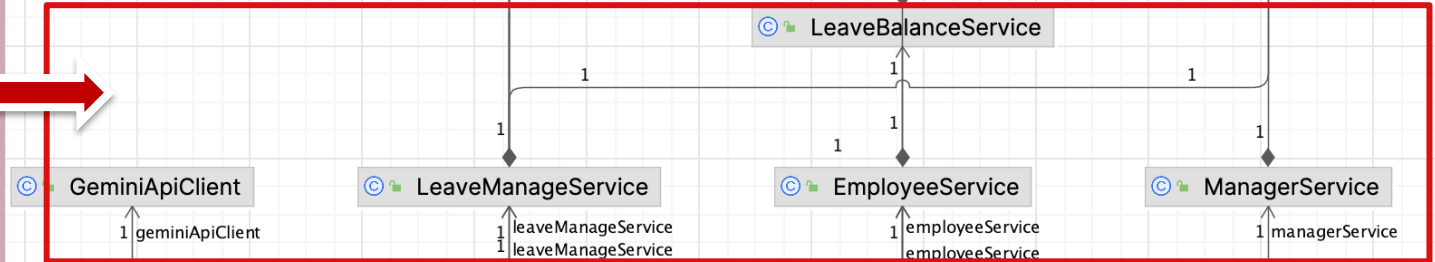


# Class Diagrams-2

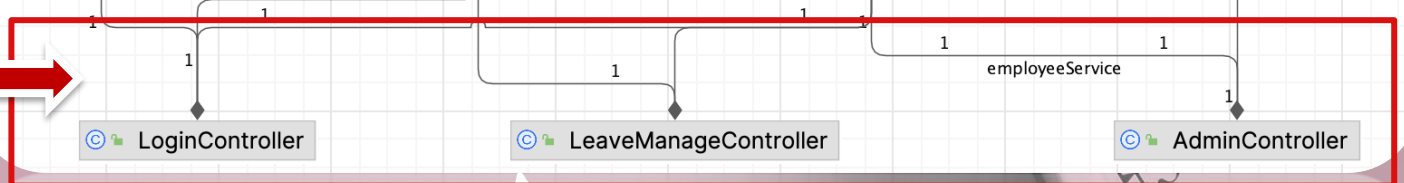
## Repositories Layer



## Services Layer



## Controllers Layer



# One Interesting Method

- In LeaveManageController.java class, we have the method to show users' leaves:

```
@GetMapping("/my-leaves")
public String showMyLeaves(@RequestParam Optional<String> status, Model model) {
    Authentication auth = SecurityContextHolder.getContext().getAuthentication();
    String email = auth.getName();

    List<LeaveDetails> leavesList = leaveManageService.getAllLeavesOfUserByStatus(email, status.orElse(null));
    model.addAttribute("leavesList", leavesList);
    model.addAttribute("selectedStatus", status.orElse("ALL"));
    return "MyLeaves";
}
```

- In LeaveManageService.java class, is how the method “communicates” with our data repository

```
public List<LeaveDetails> getAllLeavesOfUserByStatus(String email, String status) {
    if (status == null || status.isEmpty()) {
        return leaveManageRepository.findByUserEmail(email);
    } else {
        return leaveManageRepository.findByUserEmailAndStatus(email, status);
    }
}
```





# Lessons Learned ...



- 01** | Deconstructing complex features into single, manageable tasks
- 02** | The journey of learning new tools like Spring Boot was painful but rewarding
- 03** | Perfection comes through continuous iteration - "Done is Better Than Perfect"

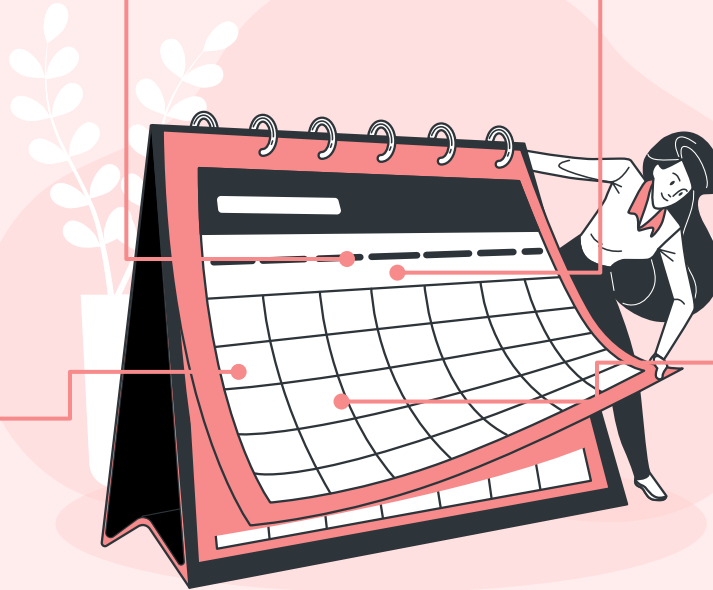
# Limitations and Future Extensions

## Expand Business Logic and Features

Introduce advanced features like accrued vacation logic and document management

## Enhance UI/UX

Adopt responsive design with more tooltips, modals, and pop-up dialogs etc.



## Customizations and Personalization

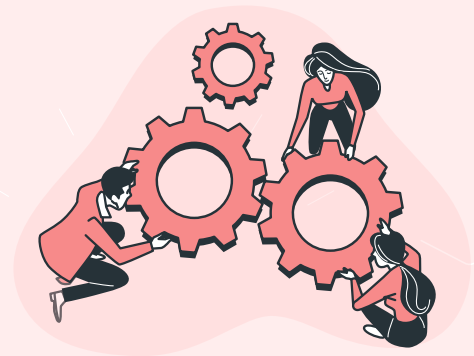
Incorporate AI for a tailored experience based on data analysis

## Mobile App Development

Add a mobile version for a more adaptable user experience across various devices

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# Thanks!

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# Appendix-1: Data Schema

Table 1: User Information (userinfo)

- Stores user credentials, personal details, roles, manager relationships, and onboarding dates.
- Key Fields: id, email, first\_name, last\_name, password, role, manager\_id, active, onboarding\_date.

```
CREATE TABLE IF NOT EXISTS userinfo (  
    id SERIAL PRIMARY KEY,  
    email VARCHAR(50) NOT NULL UNIQUE,  
    first_name VARCHAR(30) NOT NULL,  
    last_name VARCHAR(30),  
    password VARCHAR(255) NOT NULL,  
    role VARCHAR(20) NOT NULL,  
    active BOOLEAN NOT NULL DEFAULT true,  
    manager_id INTEGER REFERENCES userinfo(id),  
    onboarding_date DATE NOT NULL  
);
```

Table 2: Leave Types (leave\_types):

- Defines types of leaves and their rules, such as annual allocations and maximum accumulations.
- Key Fields: id, type\_name, description, annual\_allocation, max\_accumulation.

```
CREATE TABLE IF NOT EXISTS leave_types (  
    id SERIAL PRIMARY KEY,  
    type_name VARCHAR(50) UNIQUE NOT NULL,  
    description TEXT,  
    annual_allocation INTEGER,  
    max_accumulation INTEGER  
);
```

Table 3: Leave Details (leave\_details):

- Records details of each leave application, including durations, reasons, and statuses.
- Key Fields: id, user\_id, employee\_name, from\_date, to\_date, leave\_type\_id, reason, duration, status, active.

```
CREATE TABLE IF NOT EXISTS leave_details (  
    id SERIAL PRIMARY KEY,  
    user_id INTEGER NOT NULL REFERENCES userinfo(id),  
    employee_name VARCHAR(50) NOT NULL,  
    from_date DATE NOT NULL,  
    to_date DATE NOT NULL,  
    leave_type_id INTEGER NOT NULL REFERENCES leave_types(id),  
    reason VARCHAR(300) NOT NULL,  
    duration INTEGER,  
    status VARCHAR(20) NOT NULL DEFAULT 'PENDING',  
    active BOOLEAN DEFAULT true  
);
```

Table 4: User Leave Balance (user\_leave\_balance):

- Maintains leave balances per user, type, and year, supporting leave tracking and management.
- Key Fields: user\_id, leave\_type\_id, year, current\_balance.

```
CREATE TABLE IF NOT EXISTS user_leave_balance (  
    user_id INTEGER NOT NULL REFERENCES userinfo(id),  
    leave_type_id INTEGER NOT NULL REFERENCES leave_types(id),  
    current_balance INTEGER,  
    year INTEGER NOT NULL,  
    PRIMARY KEY (user_id, leave_type_id, year)  
);
```

# Appendix-2: Demo of NonManagerEmployee Views

Login page:

Leave Management System

Username:

employee5.1@gmail.com

Password:

\*\*\*\*\*

☐

Remember me

Sign In

Register

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Hone page:

Leave Management System

Logged in as: employee1.1@gmail.com ([Employee])

Logout

Welcome to the LeaveLog System! Use the navigation bar below to start applying for leave.

Find your current leave balance, company holiday, and special love from Gemini AI:

Home

Apply Leave

My Leaves

Change Password

Your LeaveLog Balances

Leave Type	Current Balance(Unit: day)
Vacation Leave	10
Sick Leave	10
Volunteer Day Off	1
Jury Duty Leave	10
Bereavement Leave	10
FMLA/CFRA	72
Paid Parental Leave	72

2024 Company Holidays

Date	Holiday
Monday, January 1st 2024	New Year's Day
Monday, January 15th 2024	Martin Luther King Jr. Day
Monday, February 19th 2024	Presidents' Day
Monday, May 27th 2024	Memorial Day
Wednesday, July 3rd 2024	Independence Day (Observed)
Thursday, July 4th 2024	Independence Day
Monday, September 2nd 2024	Labor Day
Wednesday, November 27th 2024	Day Before Thanksgiving
Thursday, November 28th 2024	Thanksgiving Day
Friday, November 29th 2024	Day after Thanksgiving
Tuesday, December 24th 2024	Christmas Eve
Wednesday, December 25th 2024	Christmas Day
Thursday, December 26th 2024	Day after Christmas
Tuesday, December 31st 2024	New Year's Eve

Well-being Tips (by Google Gemini)

Take a few deep breaths to calm your mind and center your thoughts. When feeling overwhelmed, focus on the present moment by engaging in a mindful activity, such as listening to calming music or taking a walk in nature.

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Apply leave page:

Leave Management System

Logged in as: employee5.1@gmail.com ([Employee])

Login

Home

Apply Leave

My Leaves

Change Password

Apply for Leave

From Date:

mm/dd/yyyy

To Date:

mm/dd/yyyy

Leave Type:

Select

Reason for Leave:

Apply Leave

Change password page:

Change Password

Current Password:

New Password:

Re-Enter New Password:

Change Password

Cancel

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View leave requests page:

Leave Management System

Logged in as: employee5.1@gmail.com ([Employee])

Login

Home

Apply Leave

My Leaves

Change Password

My Leaves

From Date	To Date	No of Days	Leave Type	Reason	Status
10 May 2024	11 May 2024	2	Sick Leave	bgpntgrsnhrthare	APPROVED
06 May 2024	07 May 2024	2	Vacation Leave	htethrea	REJECTED
08 May 2024	09 May 2024	2	Vacation Leave	htethrea	REJECTED
30 Apr 2024	01 May 2024	2	Sick Leave	bgpntgrsn	APPROVED
24 Jun 2024	27 Jun 2024	4	Sick Leave	htethrea	APPROVED

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Filter by status:

All

Apply Filter

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# Appendix–3: Demo of Additional Manager Specific Views

Manage direct reports page:

Leave Management System

Logged in as: manager5@email.com ([Manager])

Logout

Home

Manage Leaves

Apply Leave

My Leaves

Change Password

Manage Users

Name	E-mail	Role	Action
Employee FiveOne	employee5.1@email.com	Employee	<a href="#">Edit</a> <a href="#">Block</a> <a href="#">Delete</a>

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Update direct reports page:

Edit User

First Name:

First Name

Last Name:

Last Name

E-mail:

Email

Password:

Password

Onboarding Date:

mm / dd / yyyy

Role:

Manager

Employee

Save

Cancel

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Approve/Reject leave requests page:

Leave Management System

Logged in as: manager5@email.com ([Manager])

Logout

Home

Manage Users

Apply Leave

My Leaves

Change Password

Manage Leaves

Name	From Date	To Date	No of Days	Leave Type	Reason	Action
Employee FiveOne	10 May 2024	11 May 2024	2	Sick Leave	bgstntrsnhtsrshre	APPROVED
Employee FiveOne	06 May 2024	07 May 2024	2	Vacation Leave	tttttttt	REJECTED
Employee FiveOne	08 May 2024	09 May 2024	2	Vacation Leave	htehthea	REJECTED
Employee FiveOne	30 Apr 2024	01 May 2024	2	Sick Leave	bgdbnsgns	APPROVED
Employee FiveOne	24 Jun 2024	27 Jun 2024	4	Sick Leave	teahteangdh	APPROVED

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