

## PROJECT DESIGN DOCUMENT

Project number	4
Project Title	Clinical Rostering
Document	Project Design Document
Creation date	26/03/2023
Created By	Nandini Maroo Utsav Shekhar Md Faizal Karim Anushka Jain
Client	CloudPhysician; Jitesh Sekar

## DESIGN OVERVIEW

### Architectural design

#### Subsystems:

##### 1. User Authentication:

There can be two types of users:

- Admin: They will sign in through the admin login portal.
- Users (Nurses): They will log in through the login portal in the homepage.

##### 2. Registering a user:

- Admins can register a new user using the “add users” portal, specifying the different fields required (including employee ID and password).
- The users can then use those credentials to login.

##### 3. Requesting for a leave:

Users can request for a leave in the “leave request” page by specifying the date, time-slot and the reason for the leave.

##### 4. Approving a leave:

- Admins can approve the leave using the “approve leave” portal available for admins.
- Once the leave is approved, the system makes sure that some other user (nurse) is covering that shift.

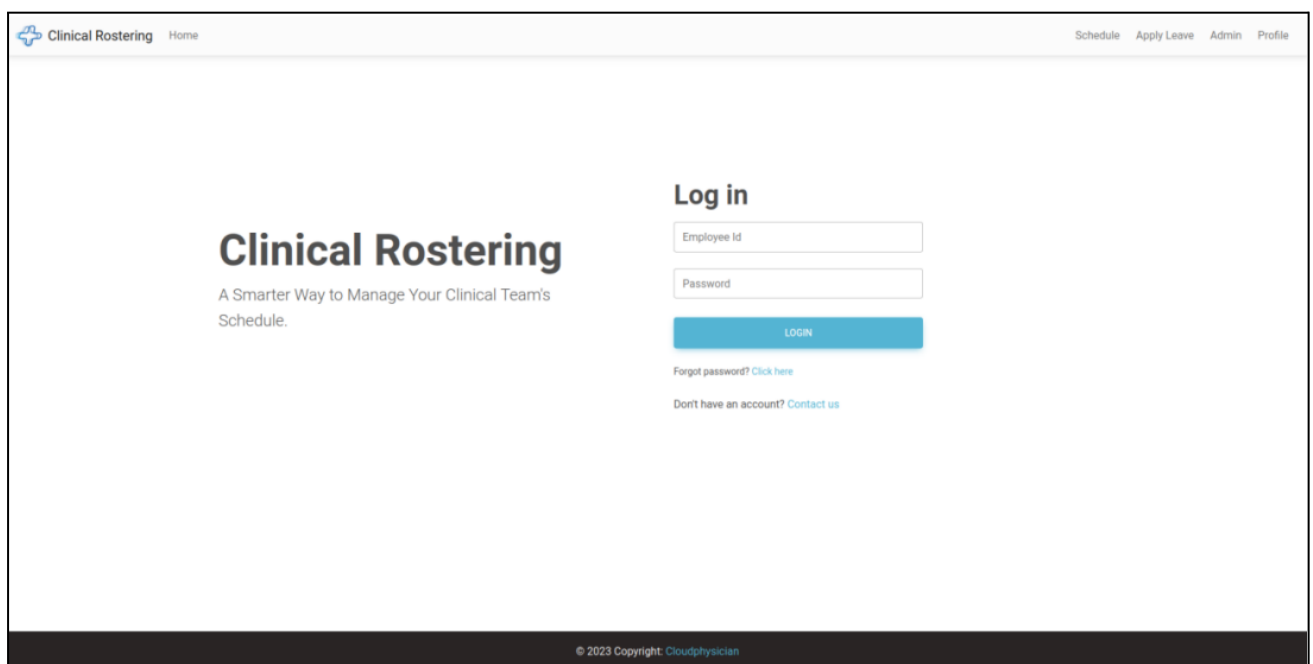
## 5. Changes in schedule:


- The changes in schedules happen in such a way that there is a fair division of work.
- The new updated schedules of the users are available on the schedule page of each user.
- The schedule provided is a colour coded 24-hr slot schedule for the day.

# SYSTEM INTERFACES

## User Interface

The following images show the different pages available to the user.



 Clinical Rostering

Home

ScheduleApply LeaveAdminProfile

# Jon Snow


Employee ID: 12345

Primary Designation: desg1

Secondary Designation: desg2

Location: location1

© 2023 Copyright: Cloudphysician

 Clinical Rostering

Home

ScheduleApply LeaveAdminProfile

## Leave Requests

« ‹ March 2023 › »

MON	TUE	WED	THU	FRI	SAT	SUN
27	28	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2

Clinical Rostering

Home

ScheduleApply LeaveAdminProfile

# Your Schedule

Date: 13th March 2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	ICU 9:10 PM			OT 9:10 PM		ICU 9:10 PM
Surgical 9:10 PM		OT 9:10 PM				
	Radiology 9:10 PM		ICU 9:10 PM	Surgical 9:10 PM		OT 9:10 PM
						OPD 9:10 PM
		Surgical 9:10 PM		OPD 9:10 PM	Radiology 9:10 PM	

© 2023 Copyright: Cloudphysician

The following images show the different pages available to the admin.

Clinical Rostering

Home

ScheduleApply LeaveAdminProfile

Sign in

Employee ID \*

Password \*

SIGN IN

© 2023 Copyright: Cloudphysician

Clinical Rostering

Home

Schedule

Apply Leave

Admin

Profile

ADD USERS

APPROVE LEAVES

Register new user

First Name \*

Last Name \*

Employee ID \*

Primary Designation \*

Secondary Designation \*

Location \*

Password \*

REGISTER

© 2023 Copyright: Cloudphysician

Clinical Rostering

Home

Schedule

Apply Leave

Admin

Profile

ADD USERS

APPROVE LEAVES

<input type="checkbox"/>	EID	Full name	Designation	Location	Date	Time Slot
<input type="checkbox"/>	1	Jon Snow	Surgeon	Emergency	19-03-2023	10AM-4PM
<input type="checkbox"/>	2	Cersei Lannister	Neurologist	OPD	20-03-2023	10AM-4PM
<input type="checkbox"/>	3	Jaime Lannister	Cardiologist	ICU	19-03-2023	3PM-4PM
<input type="checkbox"/>	4	Arya Stark	Nurse	Emergency	21-03-2023	10AM-12PM

Rows per page: 100 1-4 of 4 < >

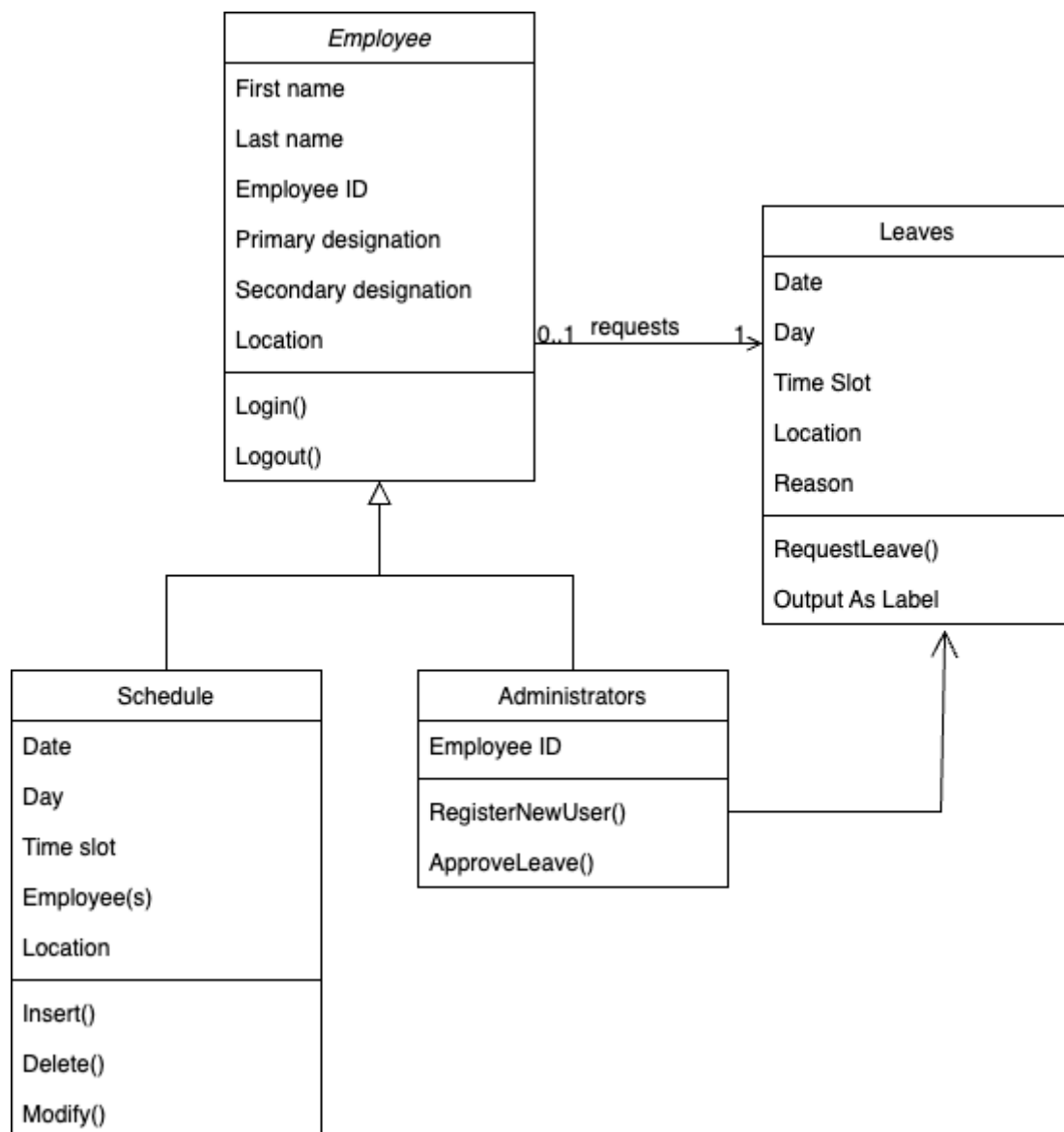
© 2023 Copyright: Cloudphysician

## APIs

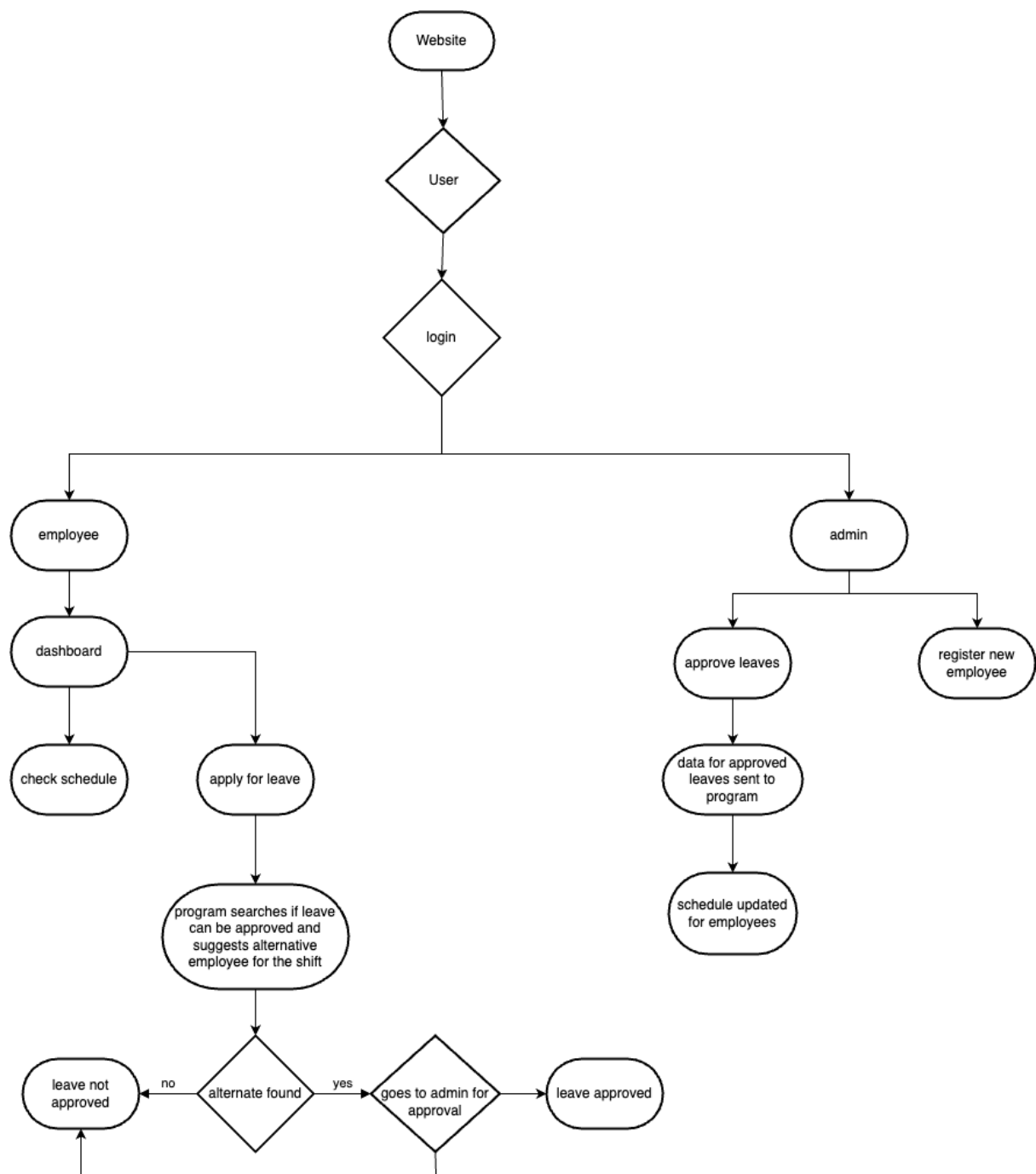
We are using the following APIs of Optapy:

1. **Solver API:** This API provides the core functionality for solving planning and optimization problems. It allows developers to define problem constraints and objectives, and provides various algorithms for finding solutions to the problem.
2. **Domain API:** This API enables us to define the domain objects and their relationships that are relevant to the planning and optimization problem. This includes the data model and constraints that define the problem
3. **Score API:** This API provides the interface for calculating and evaluating the quality of a solution. Developers can use this API to define how the problem should be scored and optimised.
4. **Configuration API:** This API provides the tools for configuring the solver and its behaviour, such as selecting a specific algorithm, tuning algorithm parameters, and defining the solver's termination conditions.
5. **Solution API:** This API is used to define the problem domain model and the constraints that must be satisfied by any valid solution. It also provides methods for generating and evaluating candidate solutions.
6. **Termination API:** This API is used to define the stopping criteria for the solver, such as maximum runtime or number of iterations.

## MODEL



## SEQUENCE DIAGRAM





## **DESIGN RATIONALE**

We have completed the design of the required screens for the frontend of our web application, which include the Login Page, Profile Page, Leave Application Page, Registration Page for Admin, and Leave Approval/Denial Page for Admin. Our design approach has considered the necessary inputs that will be received through these pages and will be sent to databases and further processed using Python FastAPI in the backend.

In the upcoming version of our application, we have been advised to keep a few essential points in mind.

- Firstly, the Login Page should provide an option for the user to select their roles, which can either be a regular employee or an administrator.
- Secondly, rendering a separate login page for the admin is not required.