CSCI 5308 - Advanced Topics in Software Development:
Final Project Documentation – Group 20

Links:

Code Repo – https://git.cs.dal.ca/courses/2022-winter/csci-5308/group20
Swagger API - https://app-staff-scheduler.herokuapp.com/api-docs/

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1. ABOUT

We are proposing a solution to automate the whole process which generates a tentative schedule for the available staff to avoid any manual conflicts of shifts. The application will centralize all the staff availability into a single place and avoid any manual data entry work for the supervisors.

- Role-based authentication is present. The menu display will be different for each logged-in role.
- The various Roles are
    - Admin
    - Supervisor
    - Staff
    - Intern

Admin
- will be the super-user and be able to register new users.
- will be able to create and inform new holidays to other users.
- Will be able to set shift timings which will be common across all departments.

Supervisor
- Will be the head of a particular department.
- Will be able to declare shift start-time and shift end-time.
- Will be able to put in requirements of the number of employees required for each shift.
- Each shift requires different types of employees who can be
    - Managers?
    - Developer?
- Will be able to generate a schedule for the upcoming week but only on Saturday and Sunday.

Staff & Intern
- Will be able to provide their availability for the next week from current week Monday to Friday.
- Shift timings will be based on the timings provided by the supervisor.
- can also choose not to provide availability for particular days and they will be excluded for that day.

2. USE CASE SCENARIOS
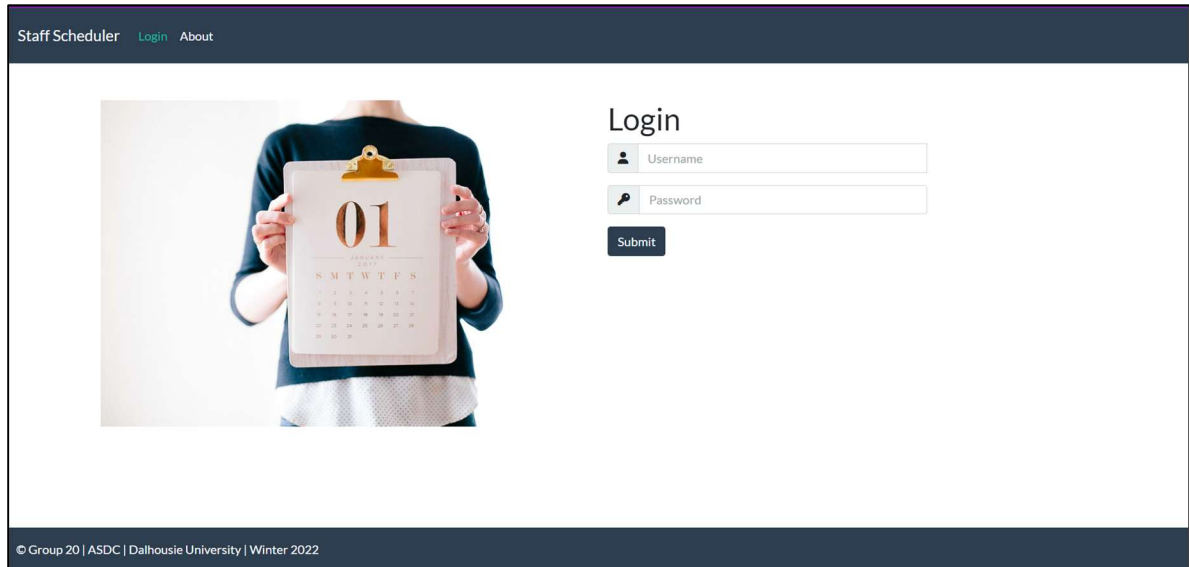
2.1 Index/Login Page

Figure 1 -Login Page of the Application - Home Page

This is the login page of the Staff Scheduler application from where an Admin, Staff, Supervisor, or Intern can log in and land on their respective landing pages.

It has the following tabs:

- **Home Page -** Consists of login fields for logging in to the application.

- **About Page -** The About tag on the navbar lands a user on the page which has details about the application. Gives a brief about the Staff Scheduler Application and provides information about each user role and its functionalities. It has a link for downloading the Android version of the application at the bottom.
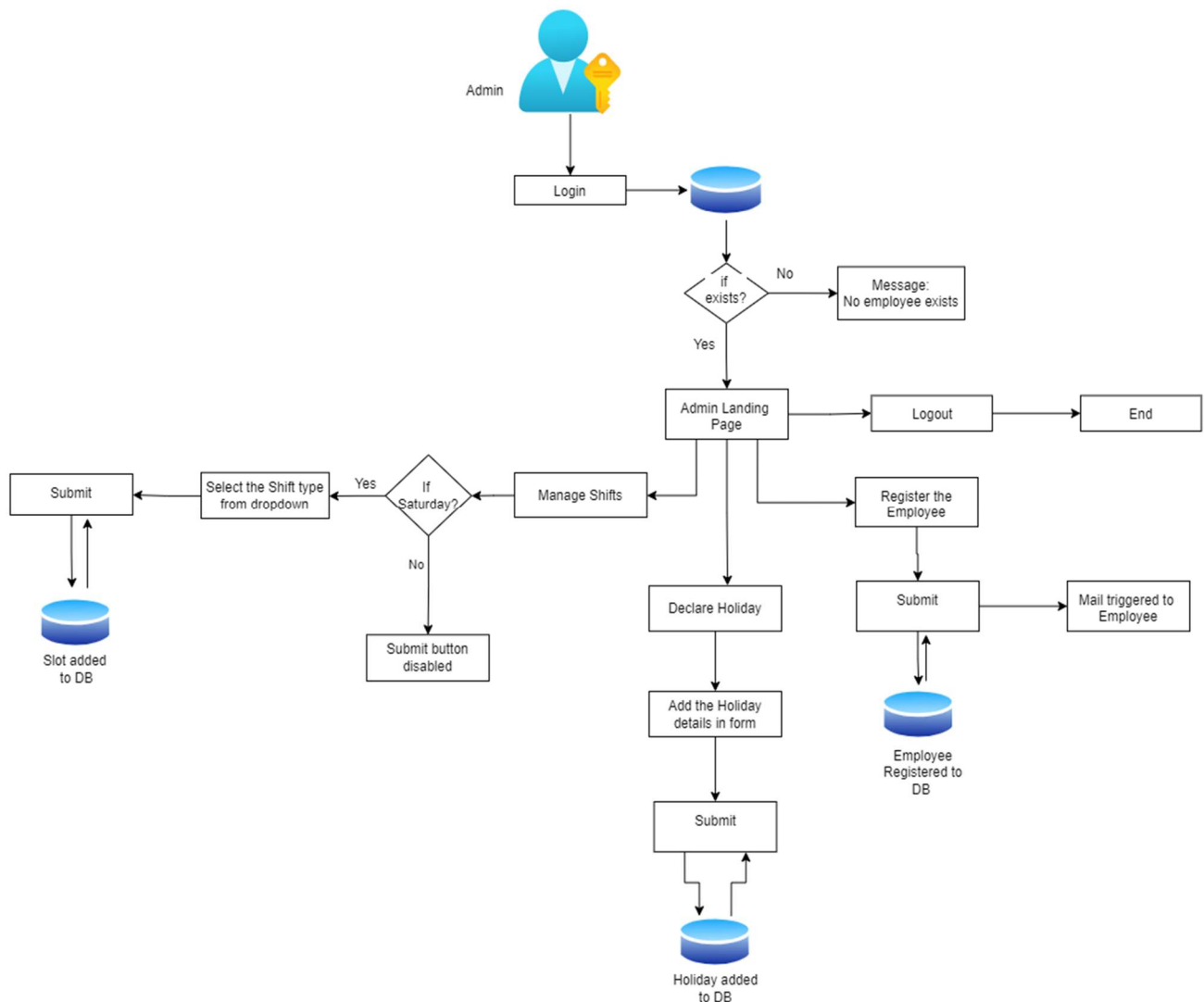
2.2 Admin Flow

Figure 2 - Use Case Diagram for the Admin Flow

Admin inserts the user credential. If credentials are incorrect, the admin will get an error message. If login is successful, the admin will land on the admin landing page. Admin can see the generic information on the landing page and can choose to either manage shifts, declare holidays or register an employee. If Admin chose to edit the shift on any day other than Saturday then submit button will be disabled. If the day is Saturday then it will allow Admin to change the shift type and save the changed details. Admin can choose to declare a holiday and submit, which can be viewed by every role on their respective dashboard. Admin can create a new employee by entering the basic details of the user. On submitting details, the user will get an email with their credentials. Clicking on logout will remove the session and redirect the admin to the login page.
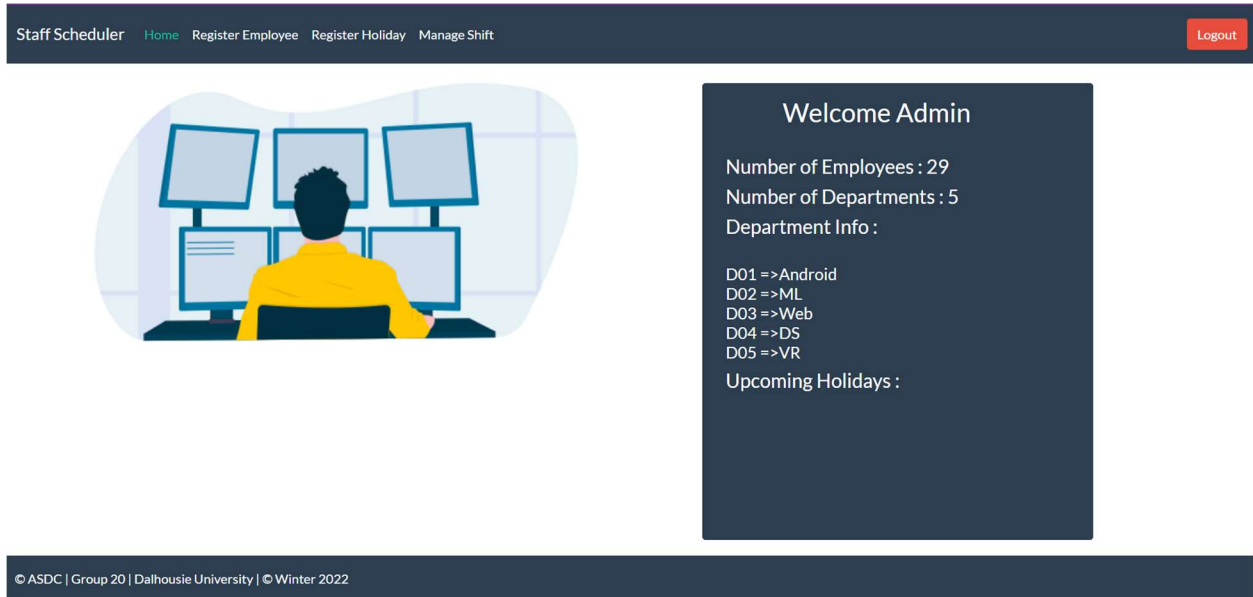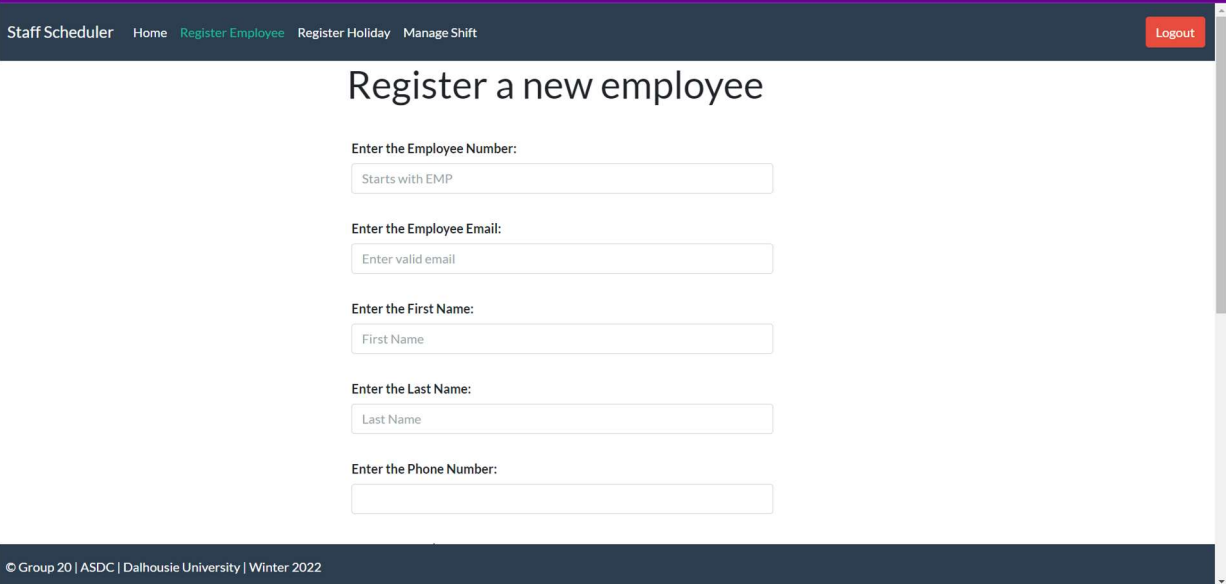
2.2.1 Admin Homepage

Figure 3 - Admin Homepage with the information of the Organisation's employees.

- This is the landing page for the user role - 'Admin'.

- It contains the basic information about the organization comprising of a total number of employees, the total number of departments, names of each department, and upcoming holidays (within the next 7 days).

- Admin has three responsibilities: Register Employee, Register Holiday, and Manage Shift.

2.2.2 Registering a new Employee

Figure 4 - Admin: Register a new Employee Page

- Admin can register a new employee to the system by filling out this employee registration form.
- Each employee added here gets added to the database along with a password generated for them. Each employee gets an Account Confirmation email providing them with their generated password.
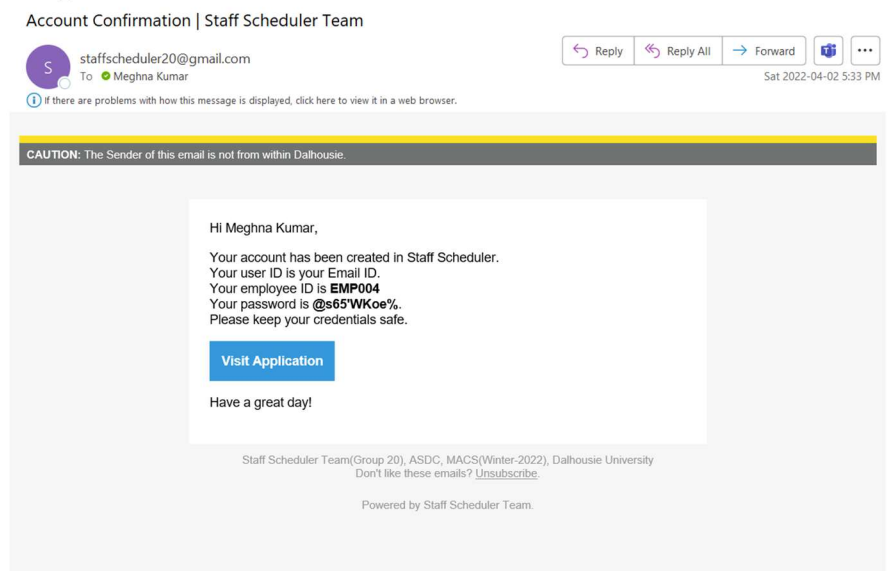

Figure 5 -Email with First Time Password.

2.2.3 Declaring the Holiday:

Figure 6 -Admin: Add a new Holiday to the System

- Admin can register a new holiday in the system by providing the details in this form.

- The registered holiday reflects on the Supervisor and Staff landing Pages and also disables the date from the calendar for Staff when they are asked to provide their availability details and for Supervisors when they are required to input the scheduler details.
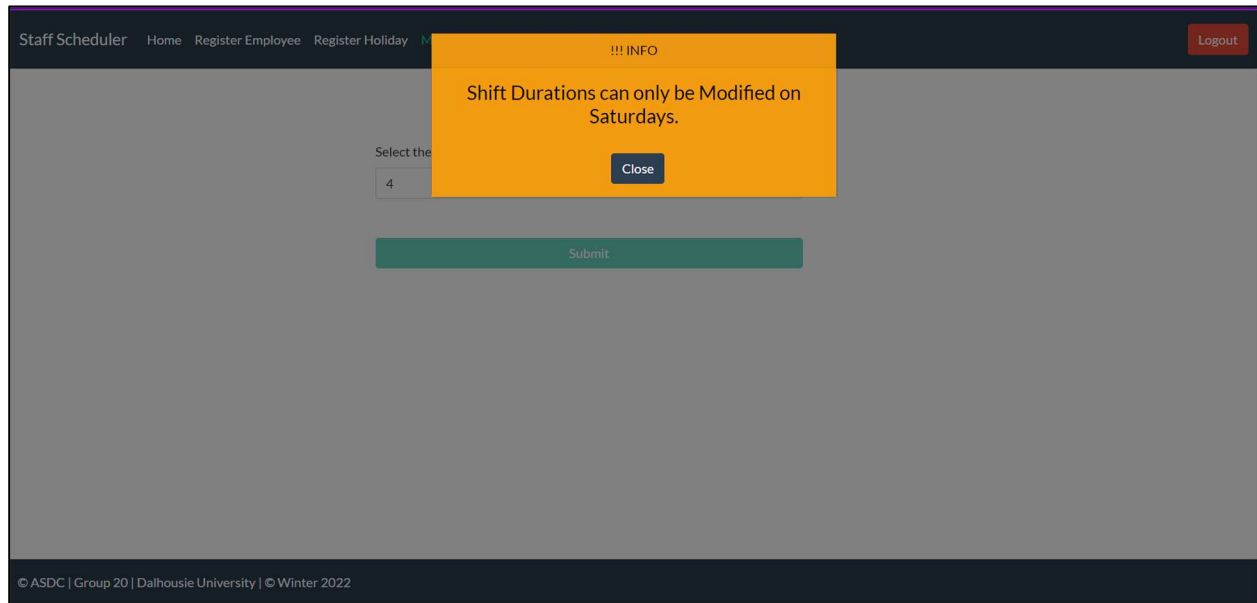
2.2.4 Manage Shifts

Figure 7 Admin - Declare the Shift Duration for all shifts in the organization. Only available on Saturdays.

- Admin has to log the shift hours for every consecutive week.
- This functionality is enabled for the admin only on Saturdays for the next starting week,
- Three shift slot types provided are - 4 hours, 6 hours, and 8 hours.
- Based on the entered slot type Supervisor will get the shifts in the drop down while filling the scheduler form.
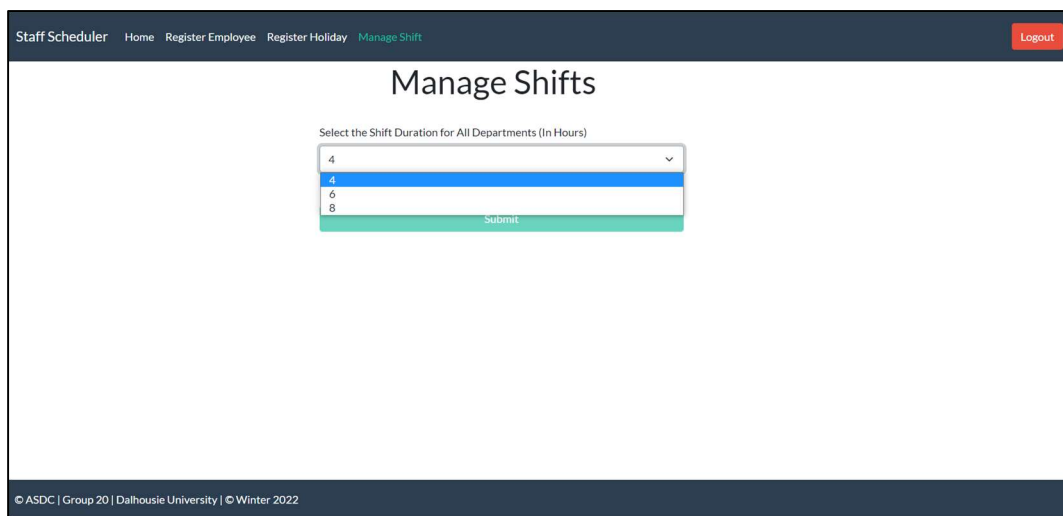

Figure 8 - Dropdown values for Shift Duration
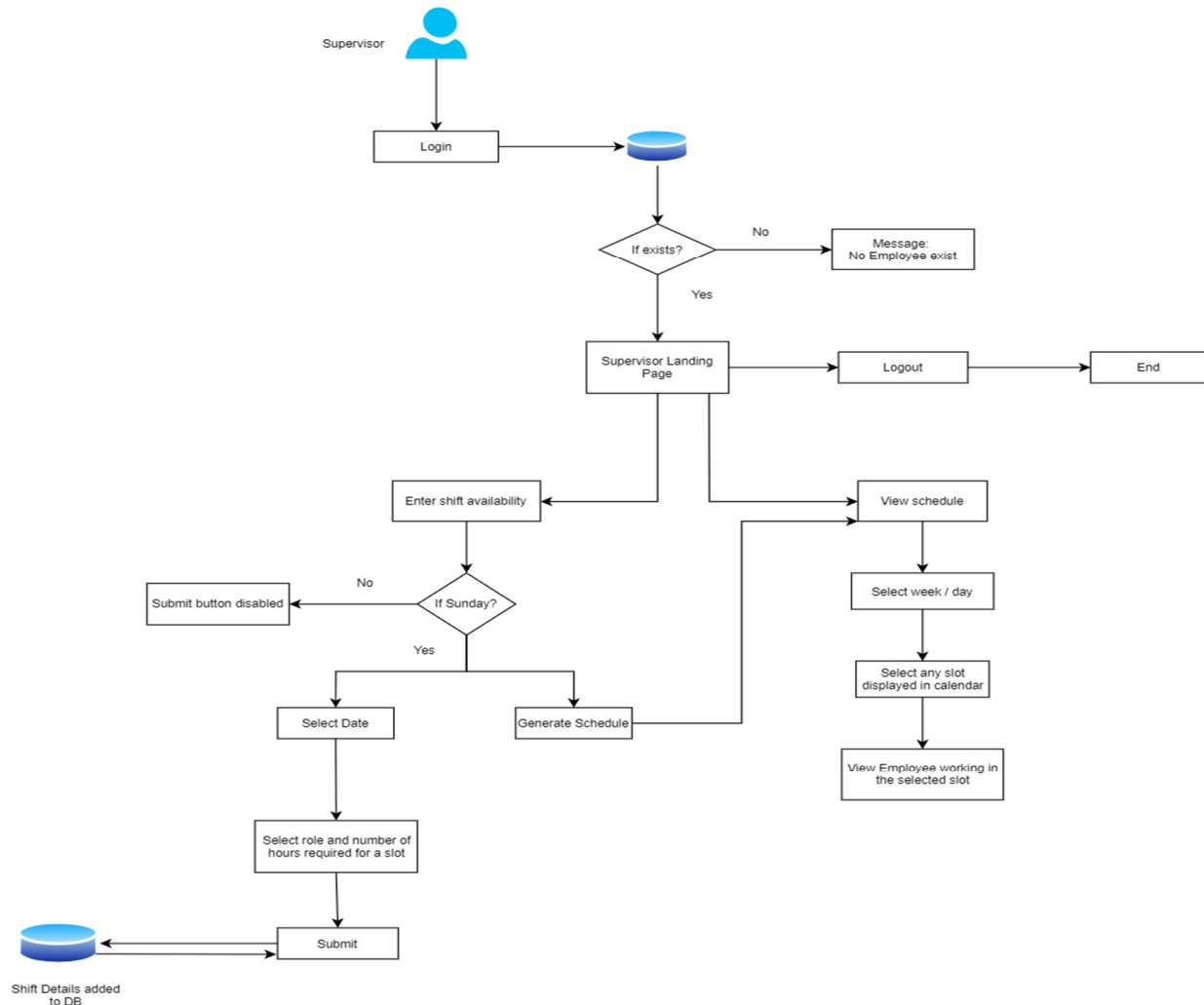
2.3 Supervisor Flow

Figure 9 - Supervisor Use case Diagram.

The supervisor inserts the user credential. If credentials are incorrect, the supervisor will get an error message. If login is successful, the supervisor will land on the supervisor landing page. Supervisors can see the generic information of their department on the landing page and can choose to either enter shift requirements or view the schedule. If Supervisor chose to enter the shift requirement on any day other than Sunday then submit and generate schedule button will be disabled. If the day is Sunday then it will allow Supervisor to add the shift details (time, role, and the number of hours) required on each day and save the details. After entering details, the supervisor can generate the schedule by clicking on generate schedule button which will create the schedule and redirect the supervisor to the view schedule page. When the supervisor goes to the schedule page they can see a calendar for 1 week with different shift timings. They can select any slot to view the employees assigned for that shift. Clicking on logout will remove the session and redirect the supervisor to the login page.
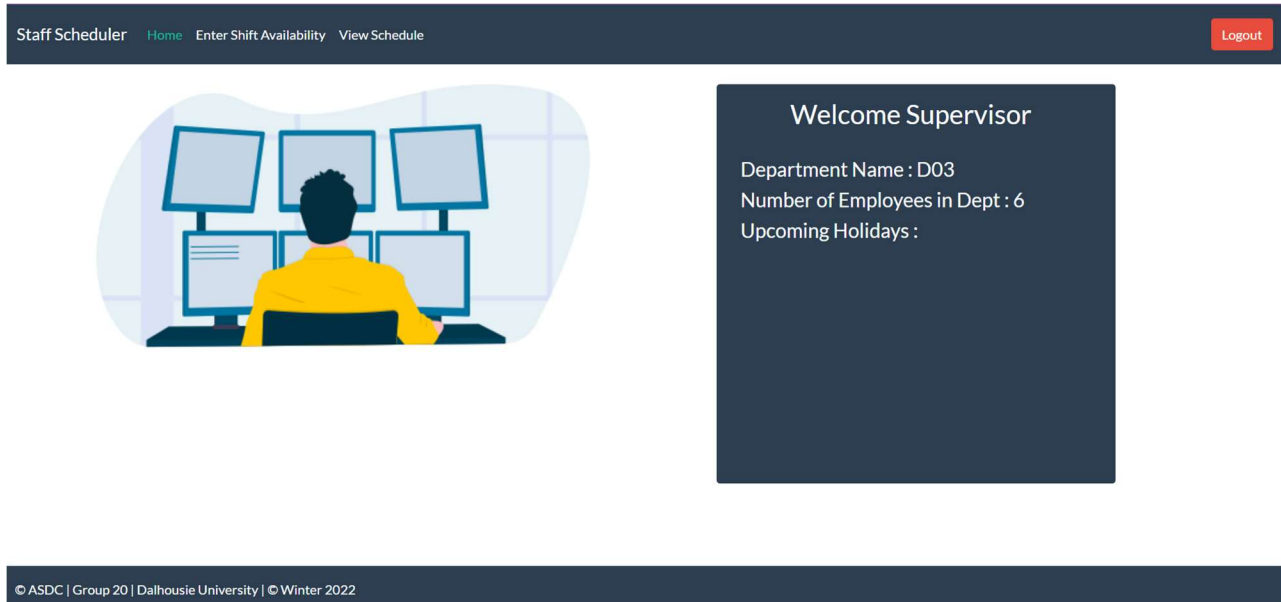
2.3.1 Supervisor Homepage

Figure 10 - Supervisor: Landing page for Supervisor with the Department level info.

- This is the landing page for the user role - Supervisor
- It contains the information about the department he is the supervisor of, the total number of employees, and upcoming holidays.
- The supervisor has the responsibility to add the requirements of employees needed for the next week to generate the schedule.
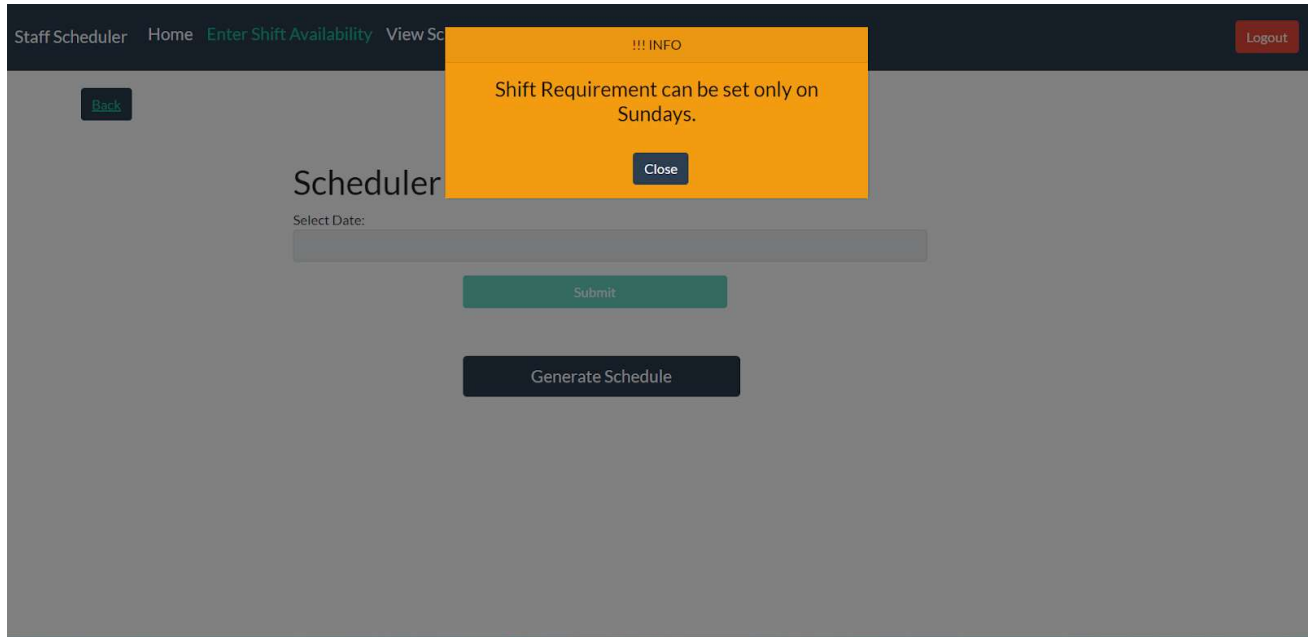
2.3.2 Entering Shift Requirements

Figure 11 - Supervisor: Entering the Requirement for the Upcoming Week. Only available on Sundays.

- The supervisor has to provide the information about the number of employees needed, with their working hours for each date of the next week to generate the schedule.

- This functionality is enabled only on Sundays after the admin has provided the slot type for the shift.

2.3.3 View Schedule

Figure 12 – Modal showing the information of the Shift.

- The schedule generated from the algorithm will have the output displayed over this calendar page.

- On clicking each shift module a pop-up opens with the Shift Details consisting of all the employees that will be working on that day for that shift.
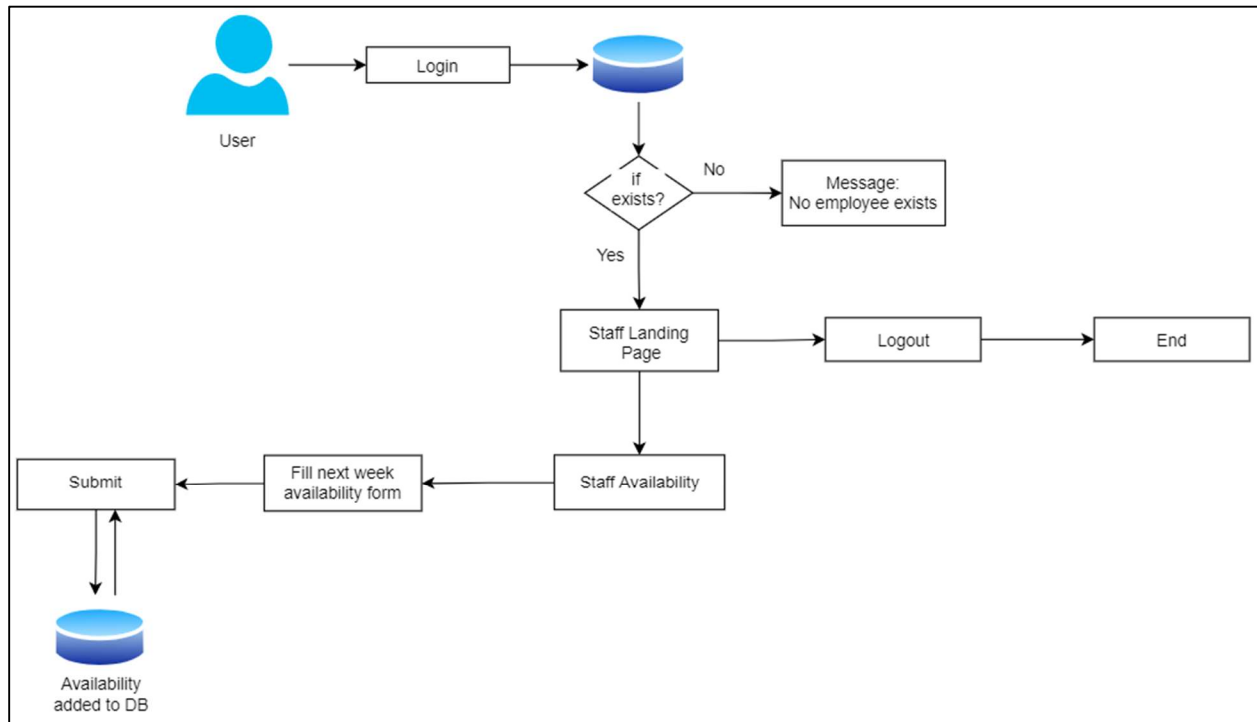
2.4 Staff Flow

Figure 13 - Staff Use case diagram

Staff inserts the user credential
If credentials are incorrect, the user will get an error message.
If login is successful, the staff will land on the staff landing page.
Staff can see the generic information on the landing page and can choose to enter their availability.
Staff can submit their availability for the entire week by selecting the available slots for each day.
Clicking on logout will remove the session and redirect the staff to the login page.

2.4.1 Staff Homepage

Figure 14 - Staff homepage with the information about the employee.

- This is the landing page for user role - Staff and Intern

- It contains the basic information about the employee - Employee ID, Department ID, Registered email ID, Contact number, Maximum availability hours, and Date of joining.

- Staff or interns have to log in and provide their availability for the next week so that the Supervisor can generate the schedule based on that data.

2.4.2 Input Availability

Figure 15 Staff: Page for the employees to enter their availability for the next week.

- Using this form Staff/Interns can provide their availability for the next week.
- The data entered here gets stored in the DB which is used in the schedule generation algorithm logic.
- This page also shows a warning to the user if the availability for a certain date has already been given before.

3. FEATURES

1. Login
- A role-based authentication is added to check the type of user
- Three user roles offered are Admin, Supervisor, Staff
- Staff can also be an Intern

2. **Admin Functionality**
- Admin can create an employee and add it to the system.
- Admin can declare a holiday and add it to the system.
- The admin can provide the shift durations for next week.
- Functionality for providing shift duration gets enabled only on Saturday.

3. **Mail Service**
- Every time a new employee is created, a mail gets triggered to them.
- The email consists of the employee ID and the password generated for the employee.
- The mail template also provides a link to directly view the application.

4. **Supervisor Functionality**
- The supervisor provides the requirements of the employee for the next week.
- The supervisor can add those details only on Sunday to generate a schedule for the following week.

5. **Staff Functionality**
- Staff provides their availability for the next week.
- Provided data is added to the DB to be picked by the scheduler while generating the schedule.

6. **Scheduler**
- The algorithm takes the requirements from Supervisor and generates a schedule for the following week based on the employee's availability.
- The scheduler also checks the employee history to check the hours an employee worked for the previous work to prioritize those employees who worked less.

7. **Android App**
- We have created an android app for the application which can be downloaded from the About tab on the Index page.
- The code for the Android app is in the docs folder in the repository.