FaceBook **2020 Developer Circles Community Challenge**

Online Lecture Scheduling react app

Developer

Tharun varshanth Krishnamoorthy
Undergraduate of Bsc, in software engineering
University of Kelaniya

Introduction

During covid19 situation lots of lectures are going on online method but there are student lot of students facing problem memorizing they lecture timetables or view the schedule because there is no proper timetables even if there is time table available but some situations lecturers will change time schedules so it is hard for students as undergraduate student I am made this app.

This app I started coding my own idea and this is not migration software I started from basic. In this app lecturer can schedule the lecture time and week days and add the meeting url. students can view time table according to they studying department .lecturer can view all department time tables and remove the schedule which subject he/she teaching.

Impact

Now university students and lecturers they view and edit they online schedules another feature they get meeting url inside timetable also so students can easily joined to the online meetings. Students and lectures they no need to maintain a own local databases inside they local machine now they will easily log in and see current lecture updates threw this use of application.
This app it is use full for students and lectures. this is app purpose completely get users if they merge this app with they university website.

Requirement Gathering

As a developer when we design a product we need to collect requirements from users.
As a developer of the these system I collect some user requirement from friends and my department lecturers from university of kelaniya

- Add a login system for lecturer and student.
- If student login then he/she will see only his/her department lecture schedules only
- If lecturer login then he/she will see any department lecture schedule and he can add he is time slot also as a lecture he can teach outside of his department also that's why he can see all department lecture schedules
- Create a separate database each departments
- Make a collection for every year student in Nosql

Tools

In this app I used **facebook open source tool/product is react js** and other open source tools mysql, Nosql database Mongodb, node js express,spring boot these 5 technologies I used.

React js :-

React is an open-source, front end, JavaScript library for building user interfaces or UI components. But most of people are have a mind set react is a framework but it is completely wrong it is a javascript library React is only concerned with rendering data to the DOM, and so creating React applications usually requires the use of additional libraries for state management and routing. React js first version is developed in 2013 .One of the most valuable and most wanted open source software tool is react js because react js is a most popular and easily programmers adaptable tool in this world.
React js has some notable features

- Component :- Components can be rendered to a particular element in the DOM using the React DOM library. When rendering a component, one can pass in values that are known as "props".
- Functional Components:- these are declared with a function that then returns some JSX.
- Class Components:- components are declared using ES6 classes.
- Virtual Dom :- React contain in-memory data structure cache, it's means virtual representation of a User Interface is kept in memory and synced with the real DOM by a library such as ReactDOM.

These are some main features of react js but without these features react has so many features. React has a community of millions of developers. react used in many popular major projects.

In this project I used react functional and class components and dom events.
I used some packages axios, react-router-dom, formik.

axios used for HTTP Request to send and retrieve data from external APIs so it can be displayed in our web pages and store data's in database. One way to build this feature is to use the Javascript *Fetch* API. Fetch is quite capable of retrieving external data, but it has some limitations. A more popular way of performing this operation is to use the *Axios* library. Axios is designed to handle http requests and responses.It's used more often than Fetch because it has a larger set of features and it supports older browsers.Axios deals with responses using *Promises*, so it's streamlined and easy to use in our code. Axios uses methods like get() and post() that perform http GET and POST requests for retrieving or creating resources.

And My experience react js very useful for application for front end development.
NoSql database Mongodb i used and it is controlled by node js express,another database I used mysql and it is controlled by spring boot

react-router-dom used for routing to connect other components, it is the process of keeping the browser URL in sync with what's being rendered on the page. React Router lets handle routing *declaratively*. The declarative routing approach allows to control the data flow in the application.

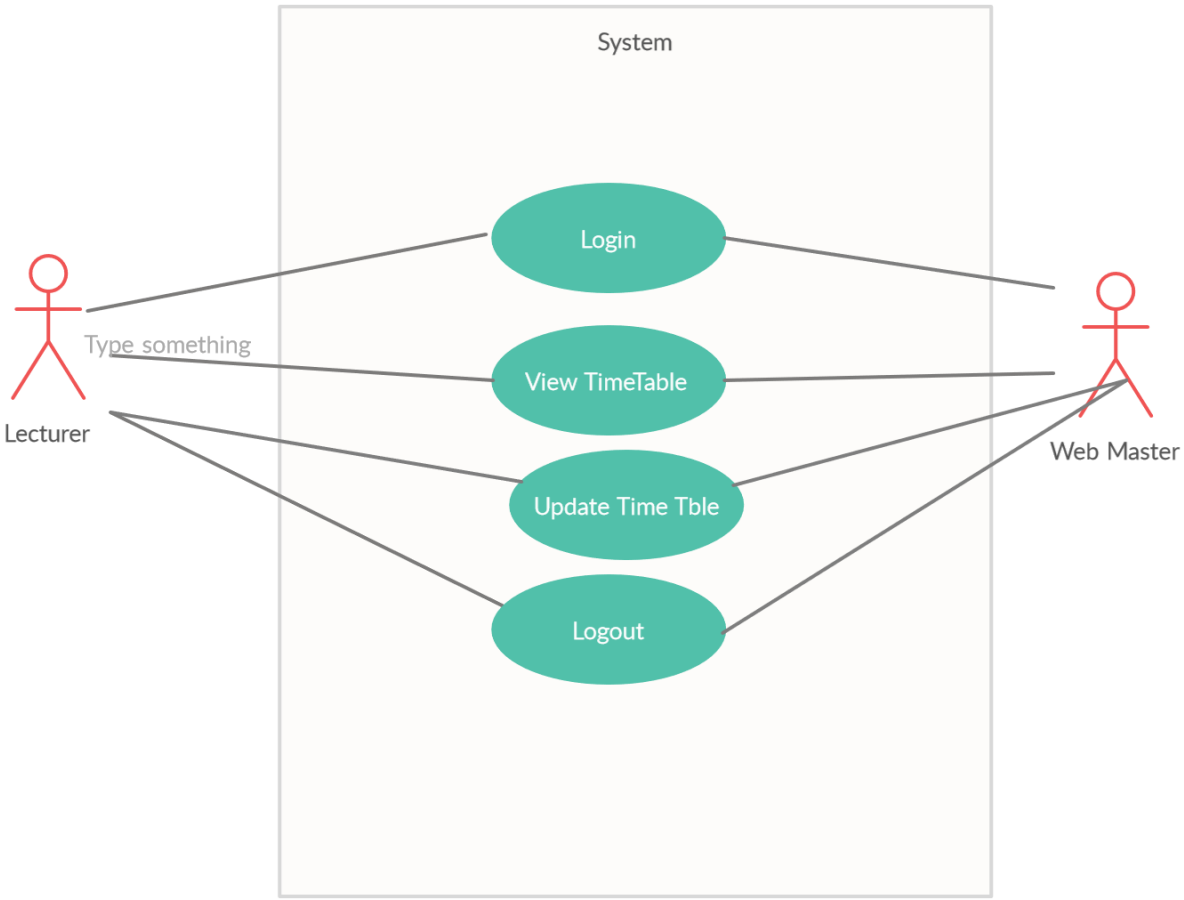
Formik is a small group of React components and hooks for building forms in React and React Native. It helps with the three most annoying parts:

- Getting values in and out of form state
- Validation and error messages
- Handling form submission

With out this packages I import some hooks from packages useState, useHistory, useEffect following this hooks usecases are useState store the data's temporarily,useHistory used for routing ,useEffect used for render method itself shouldn't cause side effects. It would be too early we typically want to perform our effects *after* React has updated the DOM.

UML Modelling

Use case diagram for Lecturer process

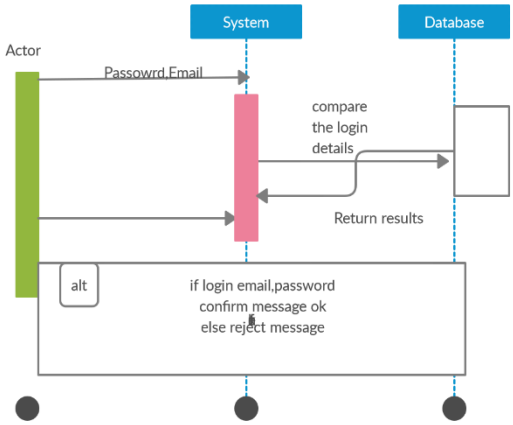


Use case name :-Lecturer update course schedule
Summary **:-** Lecturer enter the system and he/she can view all department timetables and he can make lecture schedule and remove the lecture schedule he/she assigned lecture.
Actor **:-** Lecturer/Professor
Precondition **:-** actor has to login into the system
Main sequence :-

- Lecturer has to login into the system if email and password is correct system will got to next page

- Lecturer want to choose the department then system will generate department time table
- If he/she want to make changes then choose the department ,year, semester and course code then Lecturer can make changes.

Sequence diagram for Login System



App Functions and How it'works

In this app Frond end Part I used react js
Les't see frond end function how it's works
React-app

universiyscheduler_uov/src/
in the src directory I created Home.js ,Header.js,indexbody . Home.js is the index page in contains Header.js and and indexbody.js Header.js contains university name(I created fake name) and navigation bars.Indexbody contains login form. then lecturer/student can login into the system using he is password and specific email address react js is check wheather given email address is students email address or lecturer email address and it will connect corresponding mysql table and backend part I used spring boot for mysql database connection and it will check return user's information if user will available if user not exists return null after if spring boot return user info it will save onto the localstorage using react js or else return null then will notify in web page "user not exists".
After successful login done by lecturer then it will goes LectureApp component using react routing
src\components\Lecture This directory contain LectureApp,FormAddUpdate,TimeTable

in the LectureApp component returncontain first Header next one is TimeTable final one is FormAddUpdate.TimeTable does it shows department list from mysql database .after choose the department choose and click view timetable button the it will connect to mongo database and using nodejs express and getting the time table.
Final component is FormAddUpdate component is does making new lecture schedule and updating the lecture schedule first choose department then after select year after semester then after it show course code for particular semester it will retrieve course codes from nosql mongo database after Lecturer enters the Add button it will update mongodb particular coursecode .

If student login then it will be redirect to students page ViewTimeTable component if student makes login it will get the student department which department he/she studying from the mysql database then it will pass as url parameter value after that take that parameter value get the particular department from course modules mongodb.

In this app for a back end part I used spring boot for mysql connectivity and node js express for mongo db connectivity let's see how they works.

Spring Boot -Mysql : In the mysql I created the database called university_schedule it has 3 tables lecture ,student contains email, addresss ,name these are same column for two tables and student table contain another column department which is he/she studying department name.And Another table is course table it has 3 column's department name ,degree program how the degree has been saved in mongo db .these are handled by spring boot .This is a sample project so I created databases and tables based on this this project not like a actual university project.
In the spring boot I create a main package com.uni.log.schedule inside a main package I create sub packages lecture, controller ,repo . controller package contains controller repository it is done the HTTP request post , get methods are done by ControllerRepositary class. repo package has three classes LectureRepositary, CourseRepositary, StudentRepositary this classes are connect with the particular database tables in the our database it has 3 tables lecture ,course,student tables. table package has Lecture ,Student ,Course this classes are recognize they each corresponding tables.so spring boot doing login system,get department lists.

Node js express – Mongo DB : In the mongo db I created databases for each department's and I create a collection for separately each batches.And each collection has 2 objects sem1, sem2 with in that array it has each course module details course code, meetingurl ,time, lecturer email.
I used express to these node js tasks.i created 4 files in a routes folder. GetTimeTable file has return the array, in the array each object has particular course module details. GetCourseCode file has return the course codes in a array format. RemoveSchedule file has remove the particular lecturer timetable for that course module. UpdateShedule it will add the time slot for that course module.