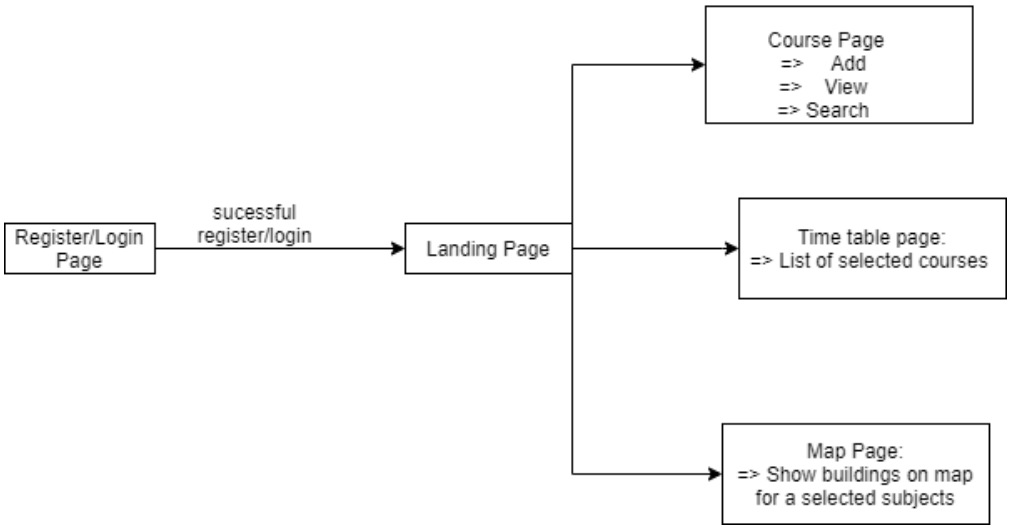
This doc will have basic requirements for the assignment task. We will also include some suggestions and libraries that we have tested. **If you are familiar with some other tools or libraries, feel free to use that. You don't have any constraints on languages, libraries, or frameworks. Your focus should be on building a product that fits the requirements.**

Problem Statement:

Design and implement an application to allow students to choose & register for multiple courses, view their timetable and render the class's location on map. The application should take care of the following aspects:

- Classes can be of multiple subjects - DBMS, Operating System, DSA etc.
- Each class has a fixed time slot. (For simplicity consider every class happens once a week at the same time. Ex DBMS: Every Monday 5pm-6pm)
- Students can add a class to their timetable if the class's time doesn't clash with already booked classes' time.
- Students can delete a class from their timetable.
- Map will render building locations for all the classes of the course (description at the end)

Project Flow:



We have split the assignment into following parts:

1. Register/Login Page: (authentication not required)
    a. Enter Student's details to login/register
2. Landing Page:
    a. Minimal UI page that links to all the following pages:
        i. Course Page:
            1. It will have a list of courses and their corresponding class's details.
            2. You can add a class to your timetable.
            3. It will show error on adding classes with the same time slots.
        ii. Timetable page:

1. This will show the list of selected classes along with their details.

iii. Map Page:

1. Input: course code
2. This will render building locations for all the classes of the course

Key Entities for Reference:

- ✓ *This is just sample schema; you can change the schema according to your convenience.*
- ✓ *Every subject should have classes on different buildings. (OS=> SJT, TT; DBMS=> SJT, MB, TT etc)*

- Course:

```
{
  "id": "CSE1002", (PrimaryKey)
  "name: "OS",
}
```

- Class: [P.S it is suggested to create classes for a subject on different buildings)

```
{
  "id": "class_id", (PrimaryKey)
  "courseCode": "CSE1002",
  "faculty": "Murali Sir",
  "building": "SJT",
  "time": "Monday 5pm-6pm"
}

{
  "id": "class_id_2", (PrimaryKey)
  "courseCode": "CSE1002",
  "faculty": "Deepa Ma'am",
  "building": "TT",
  "time": "Tuesday 5pm-6pm"
}
```

- Building:
  - Sample building object:

```
{
  "name":"SJT",(PrimaryKey)
  "location": {
    "lat": 37.7,
    "lon":-127.5
  }
}
```

- Student:

```
{
"rollNo": "19BCEXXXXX",
"name": "Student_Name",
"classes":["class1_id", "class2_id"]
}
```

Key API Endpoints

The web portal will interact with a REST API to get data.

1. POST /student:
   - Adds student to the student entity
   - Body:

```
{
   "name": "Student_Name",
   “rollNo”: “17BCE2138”
}
```

2. GET /student/{studentId}:
   - Gets a student for a given roll number

3. GET /classes/{courseCode}
   - Returns array of classes for a given course
   - Sample request
     - /courses/CSE1002
       1. Will return an array of classes of the course CSE1002

. 4. Post /class/{studentId}:
   - Adds a class to student’s entity if there are no clashes

5. Delete /class/{studentId}/{classId}:
   - Deletes a class with the given classId from the student’s entity
6. Get /class/{studentId}/:
   Gets all the classes registered by the student with rollNo = studentId
7. Get /classes-on-map/{courseCode}:
   - Get an array of classes of the given courseCode with the given additional information:
     - sum of students registered to a given class
     - building location associated to that class
   - Sample req: Get /classes-on-map/CSE1002
   - Response:

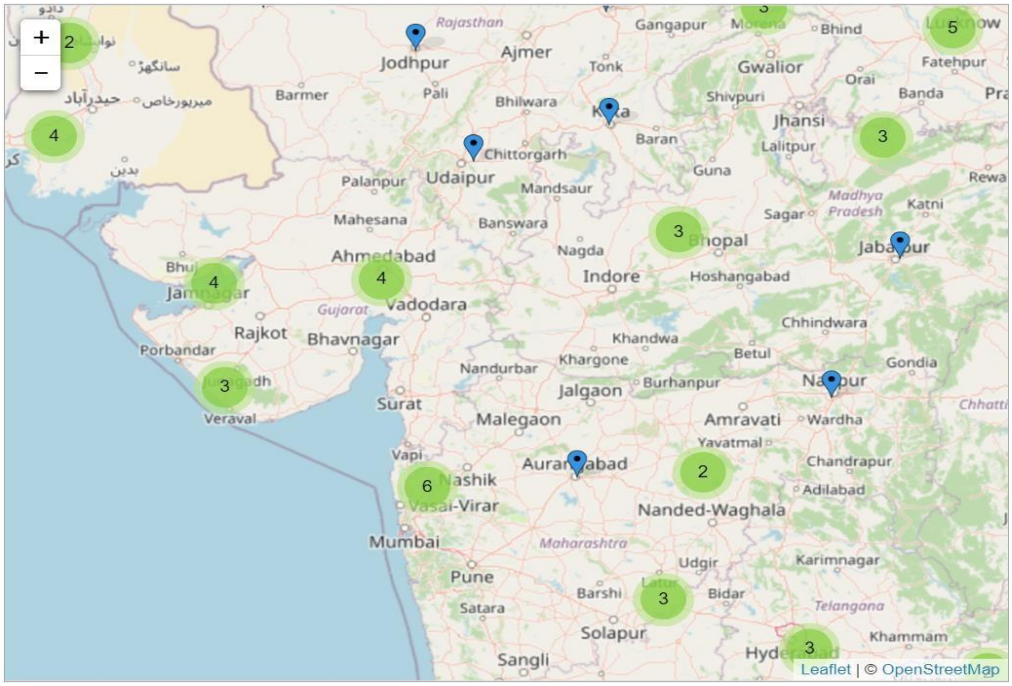
```
[
   {
      "id": "classId_1",
      "courseCode": "CSE1002",
      "faculty": "Murli Sir",
      "building": "SJT",
      "time": "Monday 5pm-6pm",
      "studentsRegistered": x,
      "location": {
         "lat": 37.7,
         "lon":-127.5
         }
   },
   {
```

```
    "id": "classId_2",
    "courseCode": "CSE1002",
    "faculty": "Deepa Ma'am",
    "building": "TT",
    "time": "Tuesday 5pm-6pm",
    "studentsRegistered": y,
    "location": {
      "lat": 38.7,
      "lon":-127.5
      }
  }
]
```

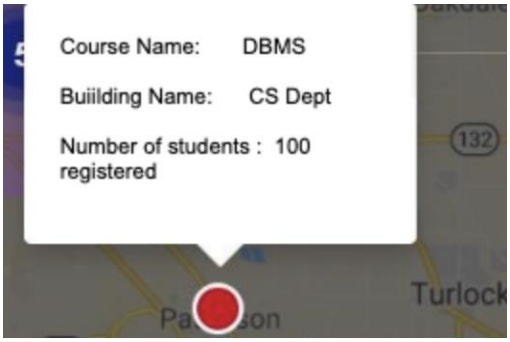

Key Http Endpoints Needed:

1. /**register**:
   - Description: This will register or logins a student
     i. GET /student/{rollNo}: for login
     ii. POST /student: for register
2. **/map:**
   - Description: This will take a courseCode as input and renders all the location associated to all the classes of a given course on the map
   - API : Get /classes-on-map/{courseCode}:
   - Features of map page:
     i. There should be a marker cluster indicating the classes on the map.
        1. On zooming in, the clusters should split into individual classes markers
     ii. On hovering over the markers, popup should be visible containing the class info:
        1. Info on popup:
           a. Course name
           b. Building name
           c. Number of students registered to this class
   -
3. **/courses:**
   - Description: This will render a list of courses and their corresponding classes
   - Functions:
     i. Logged in student can add classes to your time table
     ii. It will show error on adding classes with the same time slots
   - API:
     i. Adds a class to student' timetable and checks for clash:
        1. Post /class/{studentId}
4. /**timetable**:
   - Description: This will render a list of classes that the logged in student has registered
   - Functions:
     i. Get all the classes registered by the student. Get /class/{studentId}
     ii. You can delete classes from your timetable: Delete /class/{studentId}/{classId}:

This is how marker cluster should cluster classes' location



Sample pop up:



Expectation:

- Clean professional level Code.
- More weightage would be given to the functionalities than UI.
    - HTML and CSS can be taken from internet. Feel free to use any frameworks to polish the UI

Resources:

- Leaflet Javascript library for creating interactive maps.
    - We have tested this library, and this works for rendering location on a map. It has support for popups and has good set of libraries and good resources on the internet
- Leaflet/Leaflet.markercluster: Marker Clustering plugin for Leaflet (github.com) o This plugin can be used for market cluster functionality
- Plugins - Leaflet - a JavaScript library for interactive maps (leafletjs.com) o Plugin page of plugin. This has a good set of plugins for leaflet
- Maps, geocoding, and navigation APIs & SDKs | Mapbox o Leaflet documentation uses tiles API from mapbox. You need to create a free account here to get access key from mapbox.

Guidelines for Submission:

- Please use one of the below methods
    - Create a .zip file of all application related files and send an email (vithiring2021@motorq.com) with name and roll number
    - Upload code to public github repo and email us the link
    - Ensure that a README file is present in the base folder describing steps for any local steps required
    - **Imp: Record the working project and add the link of the video in README file.**