A

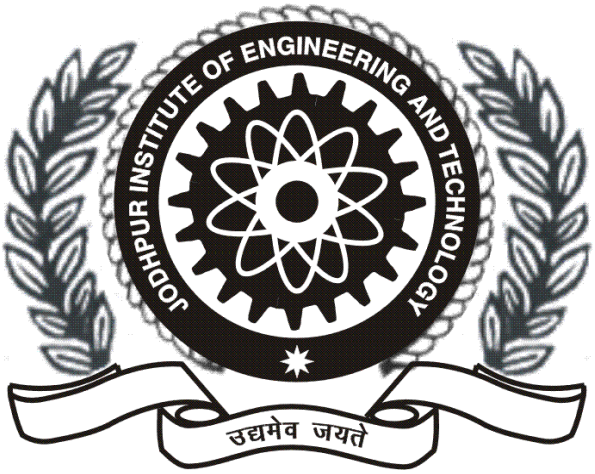
SUMMER TRAINING PROJECT REPORT

ON

WORKSHOPS AND LABS

In partial fulfillment of

B.Tech I yr **(Computer Science & Engg.)**



Submitted To:

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CSE

Acknowledgment

I would like to acknowledge the contributions of the following people without whose help and guidance this project would not have been completed.

I respectfully thank Mrs. Anju Jangid , for providing me an opportunity to do this project work and giving me all support and guidance, which made me complete the project up to very extent.

I am also thankful to Mrs. Mamta Garg, HoD of Computer Science and Engineering Department, Jodhpur Institute of Engineering and Technology, for his/her constant encouragement, valuable suggestions and moral support and blessings.

Although it is not possible to name individually, I shall ever remain indebted to the faculty members of Jodhpur Institute of Engineering and Technology, for their persistent support and cooperation extended during his work.

This acknowledgement will remain incomplete if I fail to express our deep sense of obligation to my parents and God for their consistent blessings and encouragement.

1. Table of Contents

1. Introduction

1.1 Problem Statement

Description: Presently each educational Institution has its ***WORKSHOPS AND LABS*** that are utilized by the students of that specific Institution. In Covid scenario, students are primarily studying in online mode and even if some workshop/ lab based on courses are conducted on campus, its optional for the students to join on campus and due to personal reasons and impact of covid on families, some students study in online mode. For education like Design education and other workshop/ lab-based education, students need these facilities to work on their assignments and projects. To facilitate students to utilize the facilities of Institutions closer to their hometowns, a collective database could be prepared for such facilities. These could be booked by students for specific job works and duration through their Institutions and with prior approvals. Each Institution may specify financial charges for such facilities, which may be paid by the parent Institutions or students themselves depending on the scenario whether for the specific job work, parent Institution had to provide the facility to the student or not. Payment terms for a Security Amount and the charges for usage could be specified by each Institution. This could be planned and implemented through a web-based portal. Such a solution would lead to more judicious utilization of resources and assets at national level and would benefit students staying across the country. It will have a significant impact on education and skill development at national level even in post-covid scenario.

Bucket Domain: Smart Education

1.2 Sub problems

1.2.1 Presently each educational Institution has its *WORKSHOPS AND LABS* that are utilized by the students of that specific Institution.

- The labs and workshops are only utilized by the students of specific institution.
- If the institute does not have enough students in a particular branch, then the institute is not fully utilizing its assets, so they are just lying around and aren't generating any benefit for the institution or students.

1.2.2 In Covid scenario, students are primarily studying in online mode and even if some workshop/ lab based on courses are conducted on campus, its optional for the

students to join on campus and due to personal reasons and impact of covid on families, some students study in online mode.

- Due to the covid pandemic the whole nation was not supposed to travel to different city for reducing the spread of the pandemic.
- The primarily most of the students were studying online but the real-life experience of laboratories and workshops was missing, the virtual labs did their best to tackle these kinds of situations but the real-life errors and the physical experience of different kind of equipment was cannot be expected through a virtual platform.
- The institutes tried there best to conduct this kind of laboratories and workshops but due to the inability of students going to their specific institutions due to specific reasons, so they study in online mode only.

1.2.3 For education like Design education and other workshop/ lab-based education, students need these facilities to work on their assignments and projects.

- For students of design and architecture the workshops are really important to complete their assignments and project as the need to do practical work on it
- If they can't go to their specific institution, it becomes really difficult for them to complete their assignment and project.

1.2.4 To facilitate students to utilize the facilities of Institutions closer to their hometowns, a collective database could be prepared for such facilities. These could be booked by students for specific job works and duration through their Institutions and with prior approvals.

- As there are some kind institutions are present in most of the towns and cities, so a wed portal must be made where students can visit and look around for institutions in their hometown which will help them to complete their assignment and projects, it will also help them to practice for their practical exam.
- A database must be present for storing a record of the institutions providing the service in their specific cities and the record of the students visiting the institution.

1.2.5 Each Institution may specify financial charges for such facilities, which may be paid by the parent Institutions or students themselves depending on the scenario

whether for the specific job work, parent Institution had to provide the facility to the student or not.

- As the institutions are giving their service, they will be charging a specific amount for their assets.
- The charges can be paid by the parent institution or by the student it self according to the scenario whether the parent institution wants student to get practical experience or the student wants to practice and work for their own.

1.2.6 This could be planned and implemented through a web-based portal. Such a solution would lead to more judicious utilization of resources and assets at national level and would benefit students staying across the country. It will have a significant impact on education and skill development at national level even in post-covid scenario.

- We required an online portal for providing this kind of service, so anybody in the world can access it as their requirement and need.
- As many institutions lack in the strength of students their assets are not fully utilized, they require a way to utilize their resources in a more fruitful way.
- In post covid situation the students can use this webapp for practicing their practical laboratories in their vacation time.
- The institutes will be benefits because it generates them income with minimal investment, they cab advertise the workshops organized.
- The students can develop their skill and gain knowledge from these workshops.

2. Technology used in Project

2.1 BACKEND:

2.1.1 PYTHON FLASK (FRAMEWORK)

Flask is a web framework that provides libraries to build lightweight web applications in python. It is developed by Armin Ronacher who leads an international group of python enthusiasts (POCCO). It is based on WSGI toolkit and jinja2 template engine. Flask is considered as a micro framework.

What is WSGI?

It is an acronym for web server gateway interface which is a standard for python web application development. It is considered as the specification for the universal interface between the web server and web application.

What is Jinja2?

Jinja2 is a web template engine which combines a template with a certain data source to render the dynamic web pages.

2.1.2 FLASK-SQLALCHEMY (DATABASE MANAGEMENT SYSTEM)

Using raw SQL in Flask web applications to perform CRUD operations on database can be tedious. Instead, SQLAlchemy, a Python toolkit is a powerful OR Mapper that gives application developers the full power and flexibility of SQL. Flask-SQLAlchemy is the Flask extension that adds support for SQLAlchemy to your Flask application.

What is ORM (Object Relation Mapping)?

Most programming language platforms are object oriented. Data in RDBMS servers on the other hand is stored as tables. Object relation mapping is a technique of mapping object parameters to the underlying RDBMS table structure. An ORM API provides methods to perform CRUD operations without having to write raw SQL statements.

2.1.3 FLASK-LOGIN (USER CONTROL)

Flask-Login provides user session management for Flask. It handles the common tasks of logging in, logging out, and remembering your users' sessions over extended periods of time.

It will:

- Store the active user's ID in the session, and let you log them in and out easily.
- Let you restrict views to logged-in (or logged-out) users.
- Handle the normally-tricky "remember me" functionality.
- Help protect your users' sessions from being stolen by cookie thieves.
- Possibly integrate with Flask-Principal or other authorization extensions later on.

However, it does not:

- Impose a particular database or other storage method on you. You are entirely in charge of how the user is loaded.
- Restrict you to using usernames and passwords, OpenIDs, or any other method of authenticating.
- Handle permissions beyond "logged in or not."
- Handle user registration or account recovery.

2.1.4 SMTPLIB (USER VERIFICATION)

Python provides smtplib module, which defines an SMTP client session object that can be used to send mail to any Internet machine with an SMTP or ESMTP listener daemon.

Here is a simple syntax to create one SMTP object, which can later be used to send an e-mail −

```
import smtplib

smtpObj = smtplib.SMTP( [host [, port [, local_hostname]]] )
```

Here is the detail of the parameters −

- host − This is the host running your SMTP server. You can specify IP address of the host or a domain name like tutorialspoint.com. This is optional argument.
- port − If you are providing *host* argument, then you need to specify a port, where SMTP server is listening. Usually this port would be 25.
- local_hostname − If your SMTP server is running on your local machine, then you can specify just *localhost* as of this option.

An SMTP object has an instance method called sendmail, which is typically used to do the work of mailing a message. It takes three parameters −

- The *sender* − A string with the address of the sender.
- The *receivers* − A list of strings, one for each recipient.
- The *message* − A message as a string formatted as specified in the various RFCs.

2.2 FRONTEND:

2.2.1 HTML5

HTML5 is the latest specification of the HTML language, and represented a major break with previous markup practices. The purpose of the profound changes to the language was to standardize the many new ways in which developers were using it, as well as to encourage a single set of best practices with regards to web development.

Most of the individual changes are a result of larger objectives in the design of the language. These objectives primarily include:

- Encouraging semantic (meaningful) markup
- Separating design from content
- Promoting accessibility and design responsiveness
- Reducing the overlap between HTML, CSS, and JavaScript
- Supporting rich media experiences while eliminating the need for plugins such as Flash or Java

Getting a handle on HTML5 isn't just about learning which CSS features replace old HTML features. If you want to get an intuitive sense of HTML5, it is best to understand how these objectives affected the development of the language.

Important Benefits of HTML5 to Choose for Your Project:

1. Cleaner Code Structure
2. Cross-Browser Compatibility
3. Audio and Video Tags
4. Offline Browsing
5. No More Cookies
6. Canvas for Animation and Game Development

2.2.2 CSS

CSS stands for Cascading Style Sheets. It is a style sheet language which is used to describe the look and formatting of a document written in markup language. It provides an additional feature to HTML. It is generally used with HTML to change the style of web pages and user interfaces. It can also be used with any kind of XML documents including plain XML, SVG and XUL.

CSS is used along with HTML and JavaScript in most websites to create user interfaces for web applications and user interfaces for many mobile applications.

What does CSS do

- You can add new looks to your old HTML documents.

- You can completely change the look of your website with only a few changes in CSS code.

Why use CSS

These are the three major benefits of CSS:

1) Solves a big problem

Before CSS, tags like font, color, background style, element alignments, border and size had to be repeated on every web page. This was a very long process. For example: If you are developing a large website where fonts and color information are added on every single page, it will be become a long and expensive process. CSS was created to solve this problem. It was a W3C recommendation.

2) Saves a lot of time

CSS style definitions are saved in external CSS files so it is possible to change the entire website by changing just one file.

3) Provide more attributes

CSS provides more detailed attributes than plain HTML to define the look and feel of the website.

2.2.3 BOOTSTRAP

- Bootstrap is a free front-end framework for faster and easier web development
- Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins
- Bootstrap also gives you the ability to easily create responsive designs

2.2.4 JAVASCRIPT ES6

ES6 or ECMAScript6 is a scripting language specification which is standardized by ECMAScript International. It is used by the applications to enable client-side scripting. This specification is affected by programming languages like Self, Perl, Python, Java, etc. This specification governs some languages such as

JavaScript, ActionScript, and Jscript. ECMAScript is generally used for client-side scripting, and it is also used for writing server applications and services by using Node.js.

ES6 allows you to make the code more modern and readable. By using ES6 features, we write less and do more, so the term 'Write less, do more' suits ES6. ES6 introduces you many great features such as scope variable, arrow functions, template strings, class destructions, modules, etc.

ES6 was created to standardize JavaScript to help several independent implementations. Since the standard was first published, JavaScript has remained the well-known implementation of ECMAScript, comparison to other most famous implementations such as Jscript and ActionScript.

History

The ECMAScript specification is the standardized specification of scripting language, which is developed by Brendan Eich (He is an American technologist and the creator of JavaScript programming language) of Netscape (It is a name of brand which is associated with Netscape web browser's development).

Initially, the ECMAScript was named Mocha, later LiveScript, and finally, JavaScript. In December 1995, Sun Microsystems (an American company that sold the computers and its components, software, and IT services. It created Java, NFS, ZFS, SPARC, etc.) and Netscape announced the JavaScript during a press release.

During November 1996, Netscape announced a meeting of the ECMA International standard organization to enhance the standardization of JavaScript.

ECMA General Assembly adopted the first edition of ECMA-262 in June 1997. Since then, there are several editions of the language standard have published. The Name 'ECMAScript' was a settlement between the organizations which included the standardizing of the language, especially Netscape and Microsoft, whose disputes dominated the primary standard sessions. Brendan Eich commented that 'ECMAScript was always an unwanted trade name which sounds like a skin disease (eczema).'

2.2.5 GEOLOGICAL API

he Geolocation API allows the user to provide their location to web applications if they so desire. For privacy reasons, the user is asked for permission to report location information.

WebExtensions that wish to use the Geolocation object must add the "geolocation" permission to their manifest. The user's operating system will prompt the user to allow location access the first time it is requested.

Concepts and usage

You will often want to retrieve a user's location information in your web app, for example to plot their location on a map, or display personalized information relevant to their location.

The Geolocation API is accessed via a call to navigators. geolocation; this will cause the user's browser to ask them for permission to access their location data. If they accept, then the browser will use the best available functionality on the device to access this information (for example, GPS).

1.3 CODE EDITOR:

- VISUAL STUDIO CODE
- LIVE SERVER
- PRETTIER
- JINJA2

1.4 DATABASE:

2.4.1 SQLITE

SQLite is a software library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. SQLite is one of the fastest-growing database engines around, but that's growth in terms of popularity, not anything to do with its size. The source code for SQLite is in the public domain.

What is SQLite*?*

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. It is a database, which is zero-configured, which means like other databases you do not need to configure it in your system.

SQLite engine is not a standalone process like other databases, you can link it statically or dynamically as per your requirement with your application. SQLite accesses its storage files directly.

Why SQLite?

- SQLite does not require a separate server process or system to operate (serverless).
- SQLite comes with zero-configuration, which means no setup or administration needed.
- A complete SQLite database is stored in a single cross-platform disk file.
- SQLite is very small and light weight, less than 400KiB fully configured or less than 250KiB with optional features omitted.
- SQLite is self-contained, which means no external dependencies.
- SQLite transactions are fully ACID-compliant, allowing safe access from multiple processes or threads.
- SQLite supports most of the query language features found in SQL92 (SQL2) standard.
- SQLite is written in ANSI-C and provides simple and easy-to-use API.
- SQLite is available on UNIX (Linux, Mac OS-X, Android, iOS) and Windows (Win32, WinCE, WinRT).

2. Literature Survey

Meeting with HOD's of different departments about the requirements for providing the labs to students of different institutes:

- The availability of lab technician
- Number of students booking and charging accordingly
- The requirements of the lab for working

Automating the system for maximum use of labs and how the portal can be beneficial for the institutes and students:

- The geography tag of the institutions will help the students to find the institutes near them and select the slot for laboratory according to their convenience
- It will suggest and allot the slots accordingly the demand for maximum utilisation of laboratory and workshop which will be beneficial of the institutes
- It will give the institutions a portal for advertising the workshop and courses their institute is providing
- It will be a portal for the students to get physical experience of different institute and the working of them
- The students will be able to complete their assignment and practical records along with get the physical experience and the errors arise in real world in the situations like covid

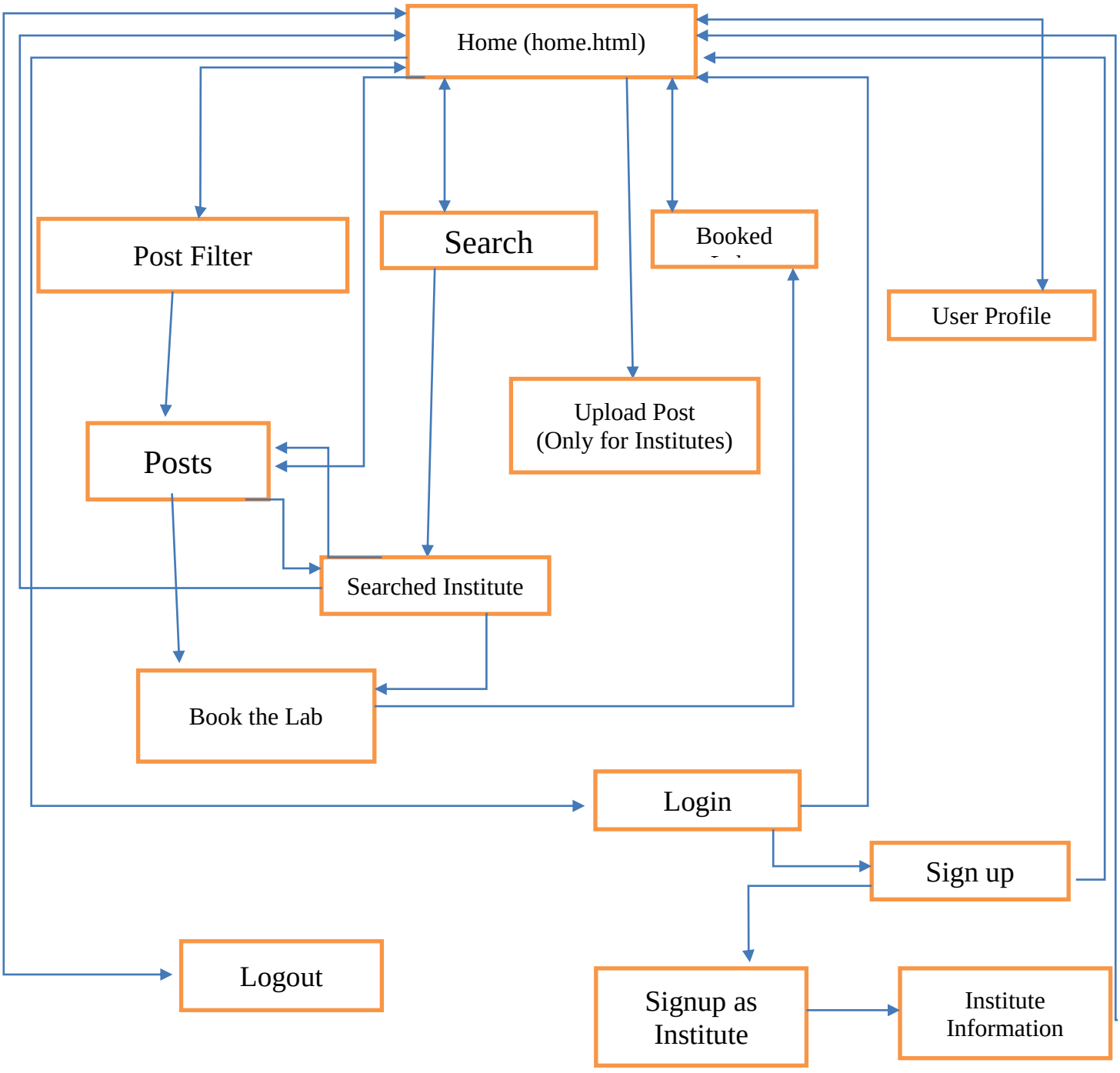
Features of the website:

- Slot booking for the laboratory and workshop
- Organised data about the dates of the slot booked and the work shops attended
- The students can give reviews about the institute
- The institutes will provide the data about their laboratory, workshop and the timings they can provide their services
- Payment facility for the institutes, either the payment will be done by students or by their parent institution
- Advertisement about workshops of different institutions can be done

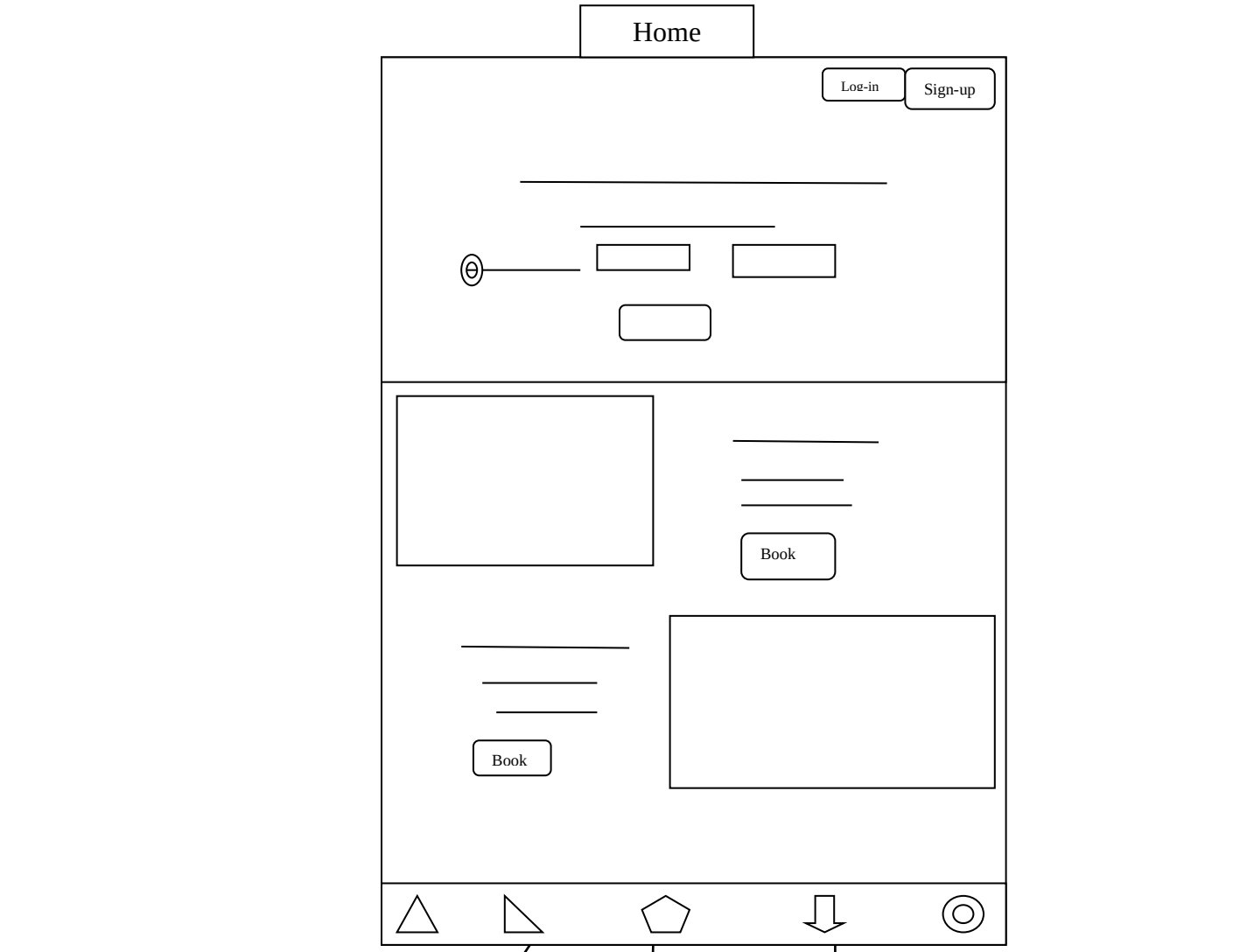
- Reviewing about the workshop

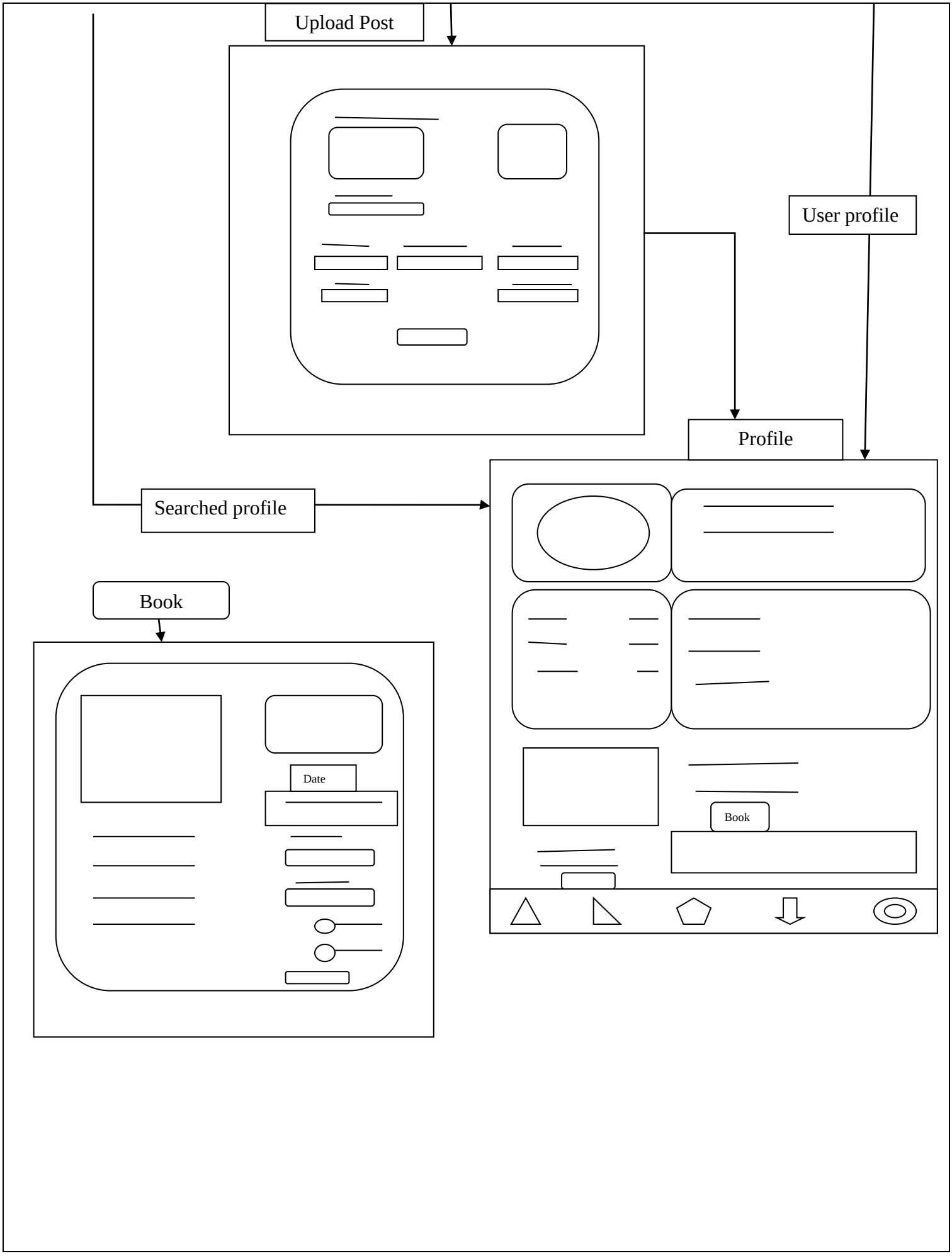
3. Details of Project

3.1 Sitemap



3.2 Wireframe

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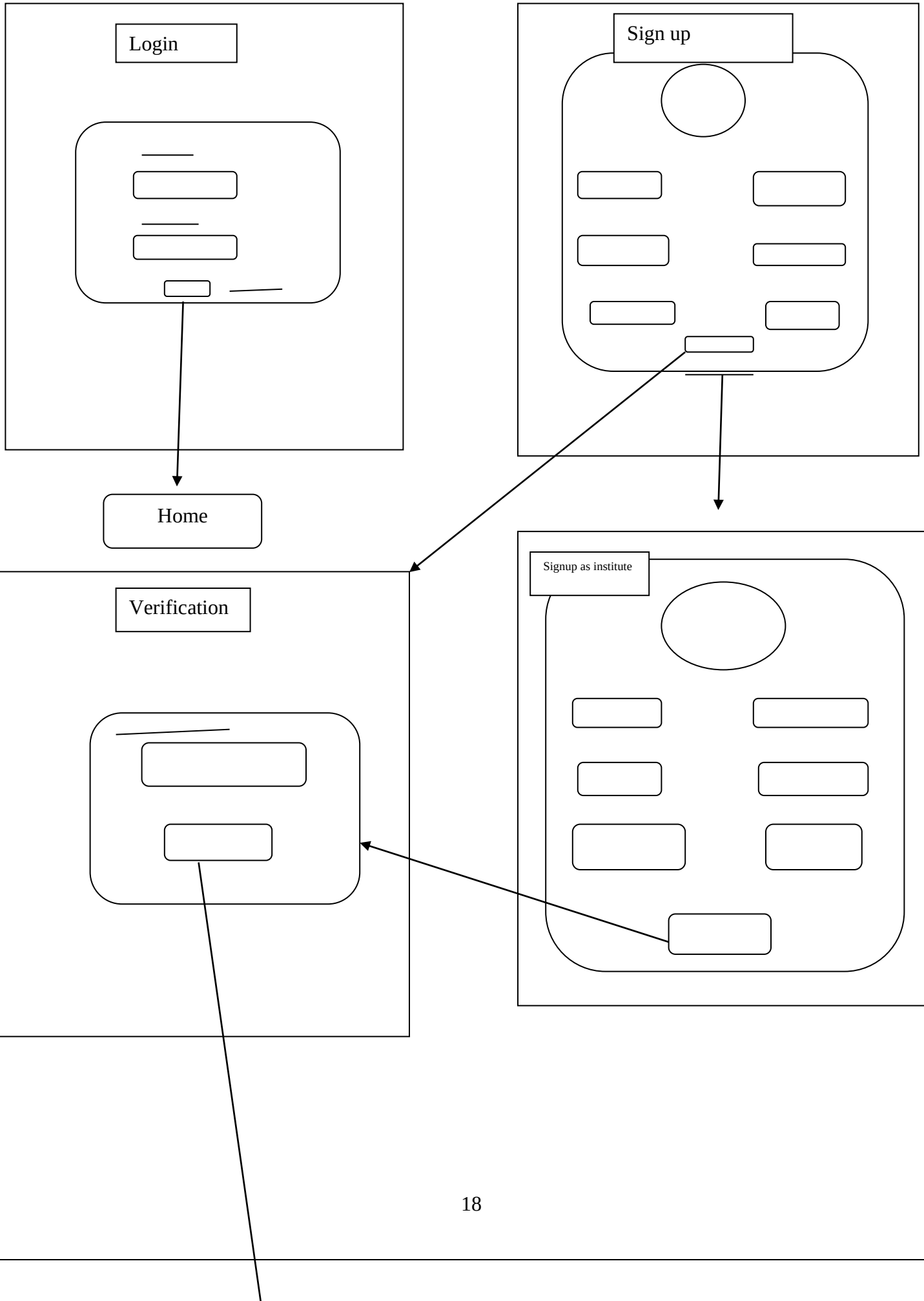
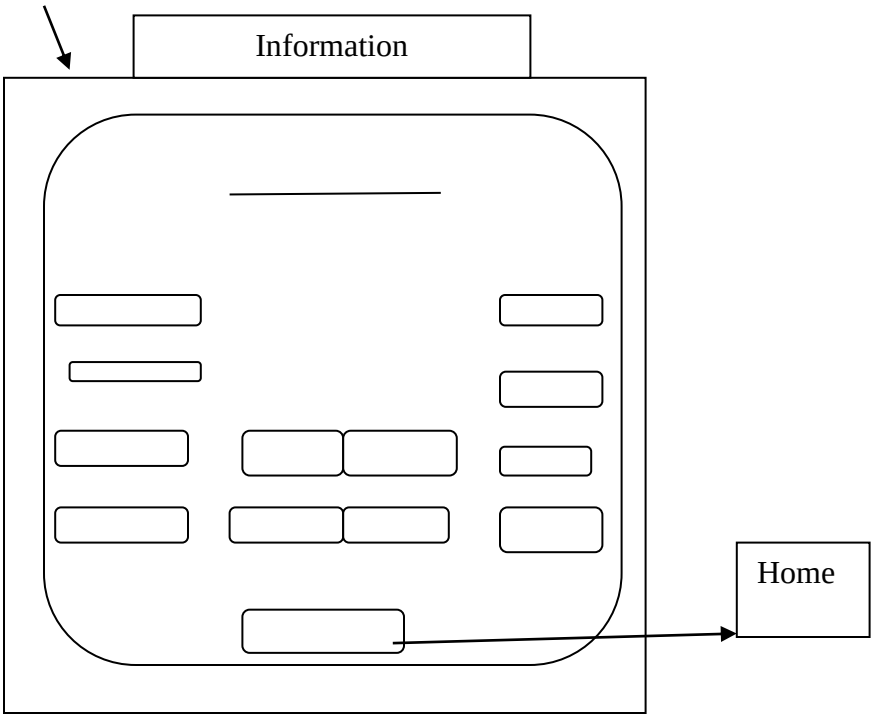

Login
Sign up
Home
Signup as institute
Verification



3.3 Goals, Requirements and Analysis

- Goals:
    - Develop a user interface for the students where they can sort different kinds of laboratories and institute.
    - A software where user can sort institutes according to the distance between them and the organization.
    - Development of a suggestion software for suggesting user different kinds of workshops.
    - Develop a timeline for students to manage their requests for different kind of laboratories and workshops, the upcoming booking of slots will also be shown in timeline.
    - Develop a request and payment verification method for the students and the institutes.
    - Portal must be developed for the institutes where they can upload about the services, they are providing it can either the use of laboratories or posting about the workshops they are organizing.

- An interface must be developed for the institutes to book slots for their students in different institutes.

Requirement:

- As a student it is really important to get physical experience of the laboratories they are studying, so in covid times and now also when they can't travel to their parent institution, they can use this platform to search and get physical experience of all the things they want.
- Some students who are perusing online degree in different fields also requires a platform where they can get to know about different laboratories and workshops around them so they can test their skills and accrue practical knowledge.
- Most of the institutions organizes different kinds of workshop and are lacking participation as they are not known by many people.

Analysis

- The students and the institutes require a platform to connect to each other.
- The students need a place where they can search and find labs and workshops for completing their assignment and projects with physical equipment and practice for their practical exams.
- The university need a platform from where they can utilize their unused assets and generate income from them.
- The institute also need a platform where it can post about the workshops they are organizing and increase public recognition.

3.4 Functions/Modules Details

1. from flask import Flask
   - Flask to create app and local server
2. from flask_sqlalchemy import SQLAlchemy
   - SQLAlchemy to Join data base and manage it
3. from os import path
   - Save uploaded post on the given path

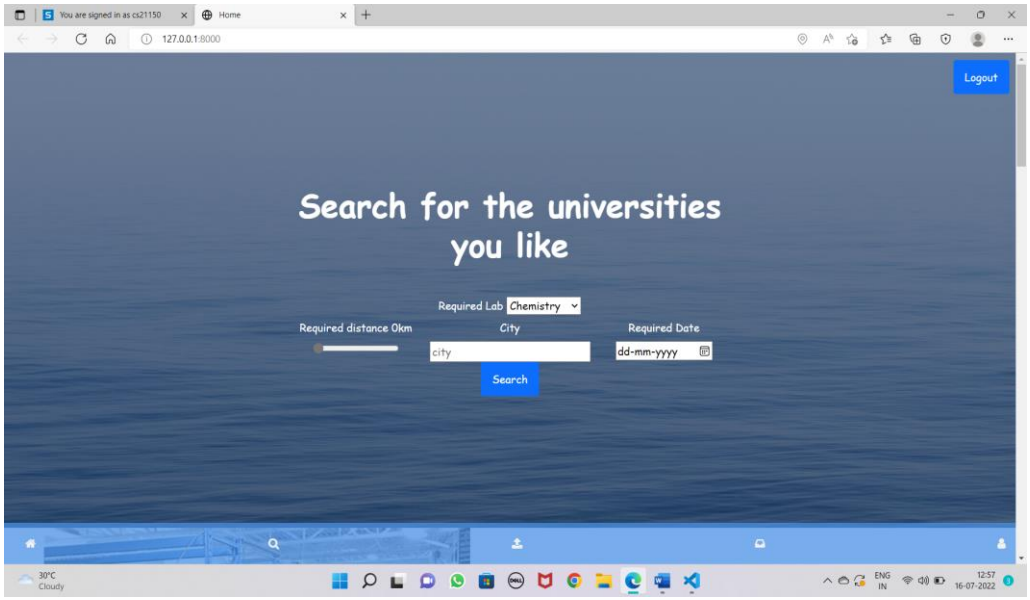
4. from flask_login import LoginManager
    - LoginManager to manage user login and logout
5. from flask import Blueprint,render_template,request, url_for,redirect
    - Blueprint is used to prepare a frame for all the end points
    - Render_templates is used to render the html templates
    - Request is used to get and send data from html page to backend
    - url_for is used to detect url for different function
    - redirect is used to redirect the user to different pages
6. from flask_login import login_required,current_user

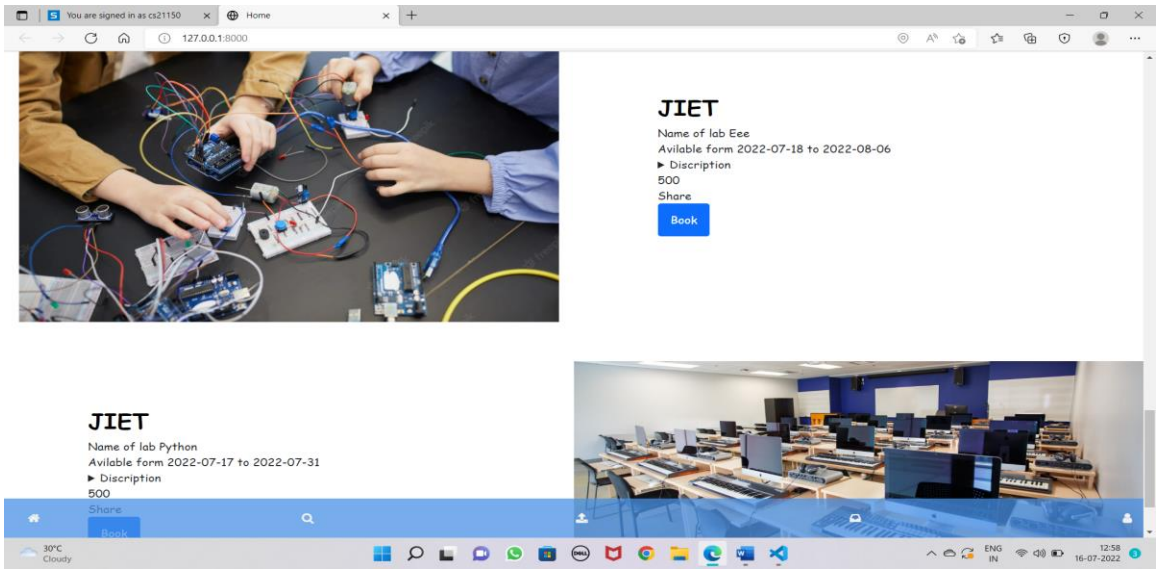
    login_required force the user to login to view certain pages

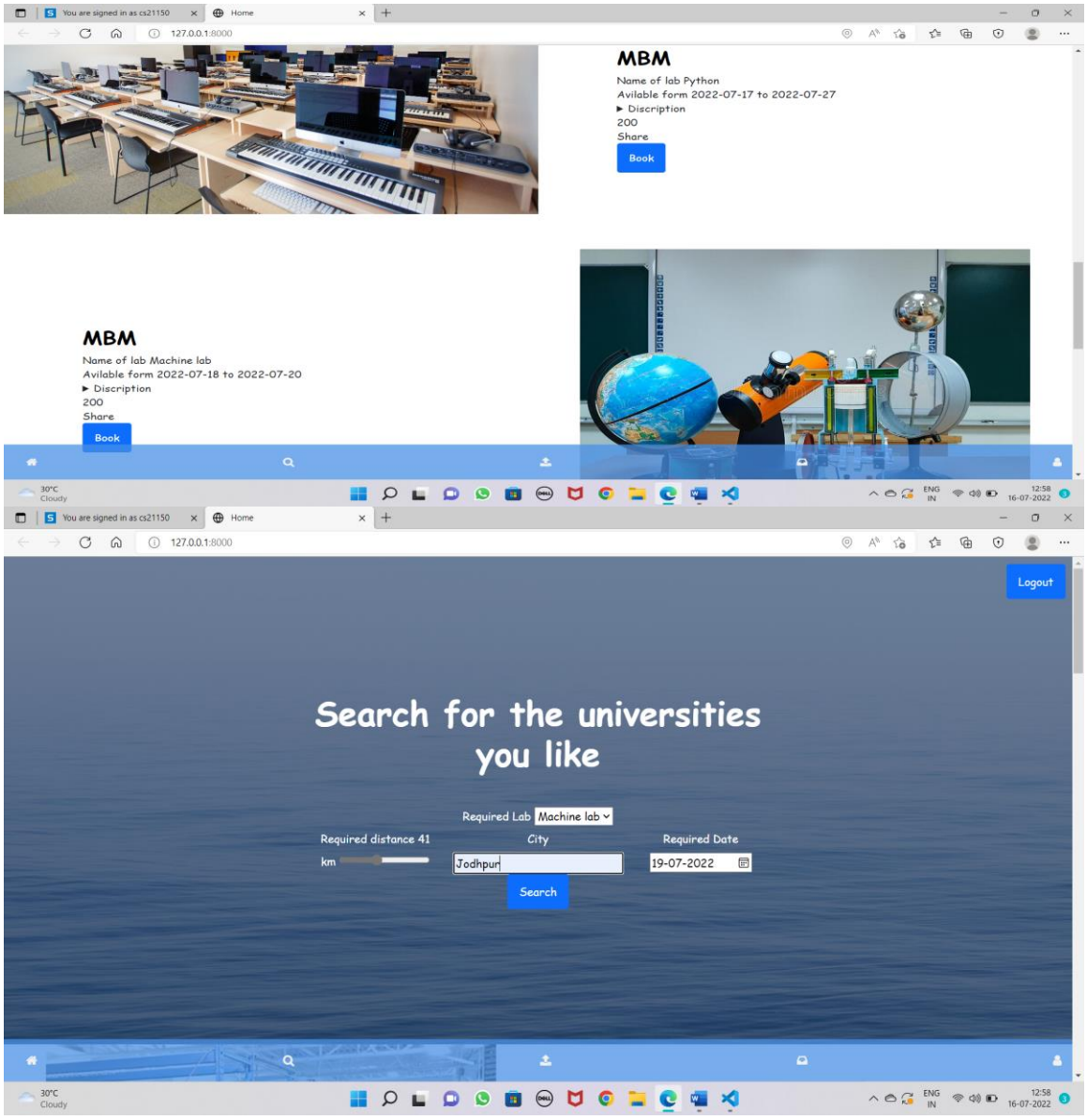
    current_user is used to store the details of the logged in user

7. import datetime
    - datetime is required to create datetime object
8. import json
    - json is used to store a list in json file for the utilization of javascript
9. import random
    - random is used to generate random one time password for verification
10. from werkzeug.security import generate_password_hash, check_password_hash
    - generate_password_hash is used to store the password in an encrypted form
    - check_password_hash is used to check if the password given by user and password in database are same or not
11. import uuid as uuid
    - uuid is used to rename the given pictures as we need to locate them
12. import smtplib
    - smtplib is used to send email for conformation and verification
13. import haversine
    - haversine is used to find the distance between the user and institute
14. from flask_login import UserMixin
    - UserMixin is used to manage user data for logged in users
15. from sqlalchemy.sql import func
    - func is used to store current date and time in sqlite database

3.5 Project Screenshots



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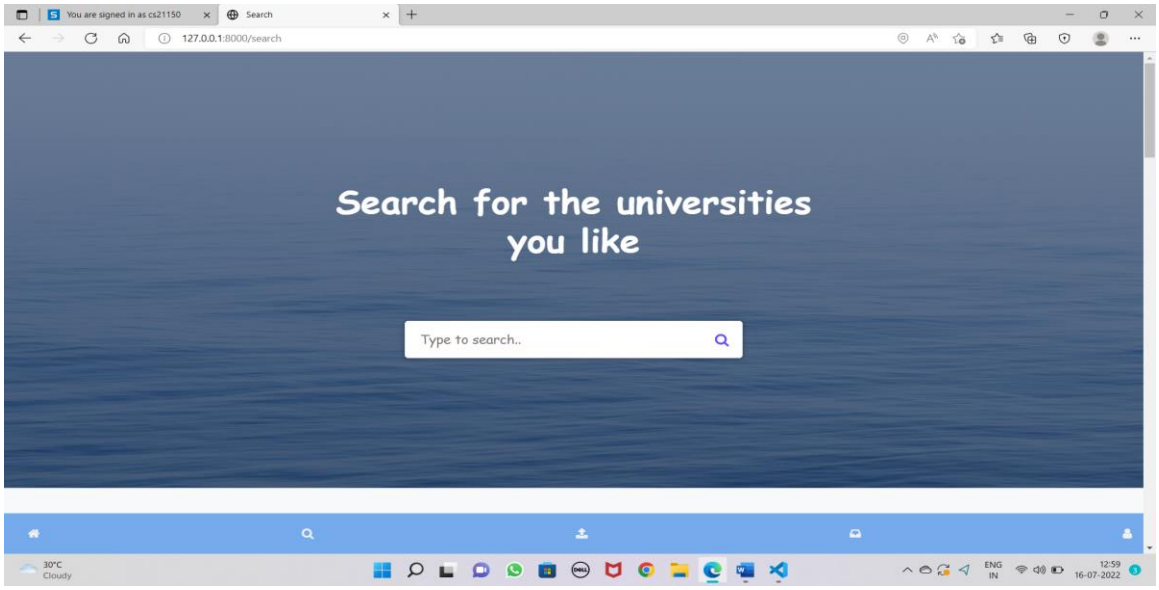
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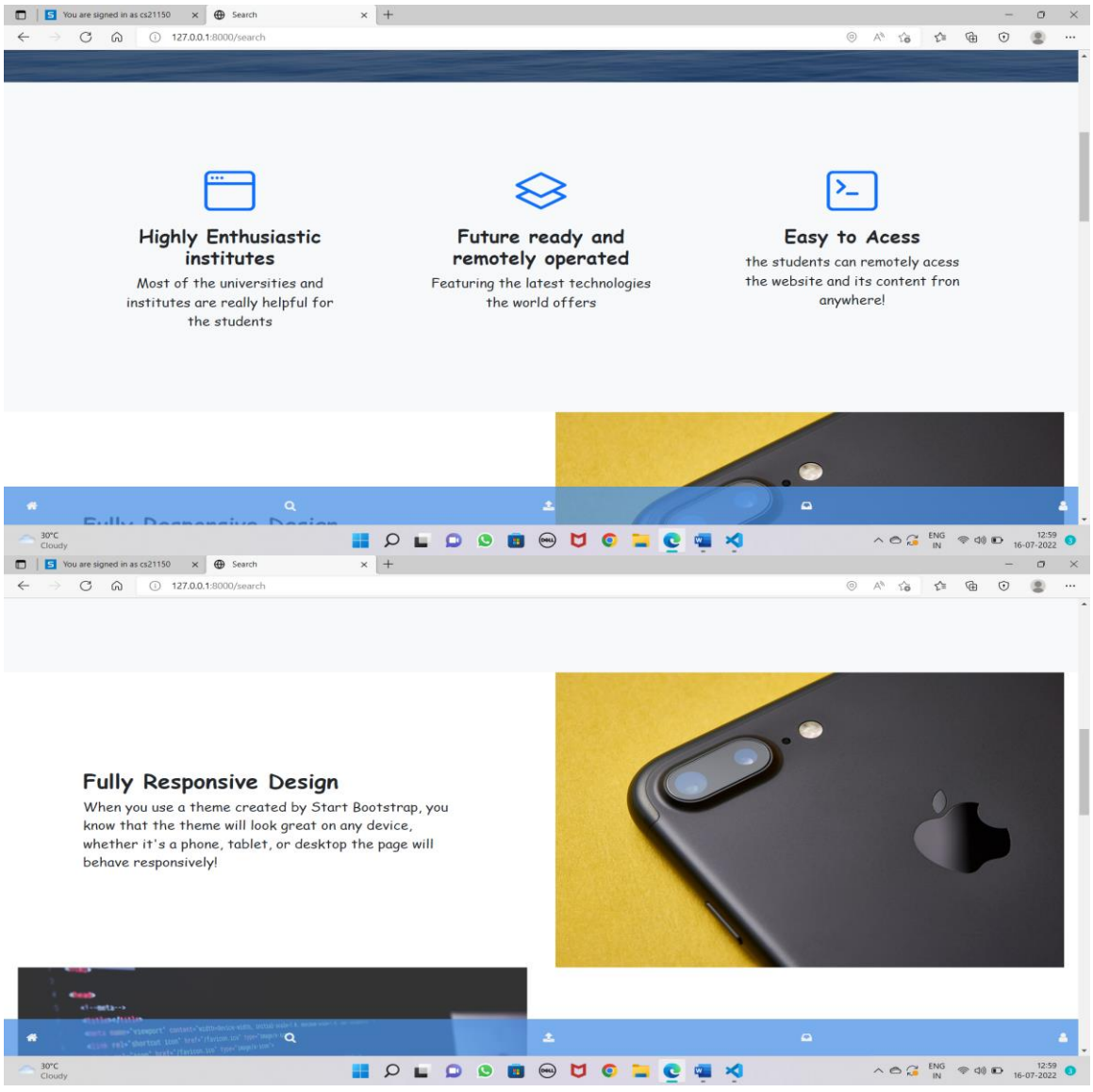
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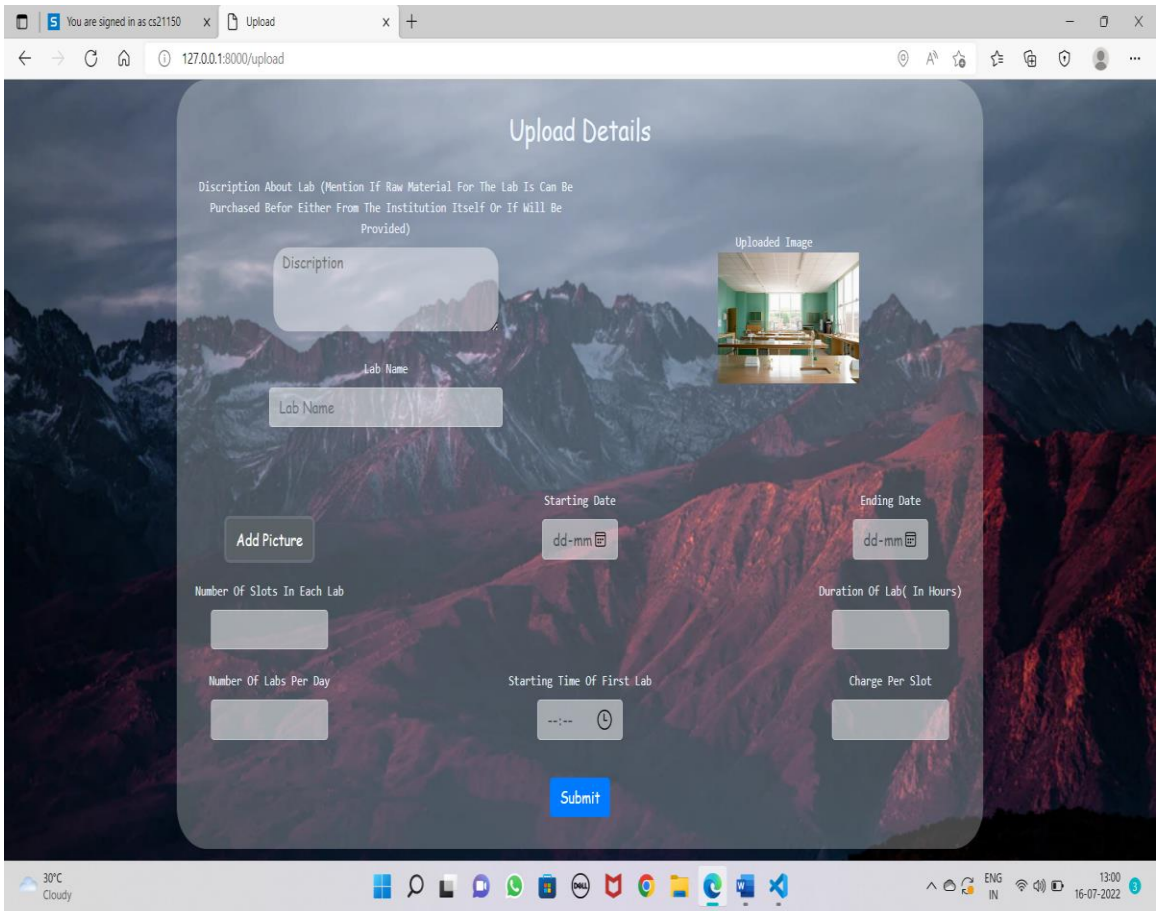
Highly Enthusiastic institutes
Most of the universities and institutes are really helpful for the students
Future ready and remotely operated
Featuring the latest technologies the world offers
Easy to Acess
the students can remotely acess the website and its content fron anywhere!
Fully Responsive Design
When you use a theme created by Start Bootstrap, you know that the theme will look great on any device, whether it's a phone, tablet, or desktop the page will behave responsively!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Discription About Lab (Mention If Raw Material For The Lab Is Can Be Purchased Befor Either From The Institution Itself Or If Will Be Provided)
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Lab Name
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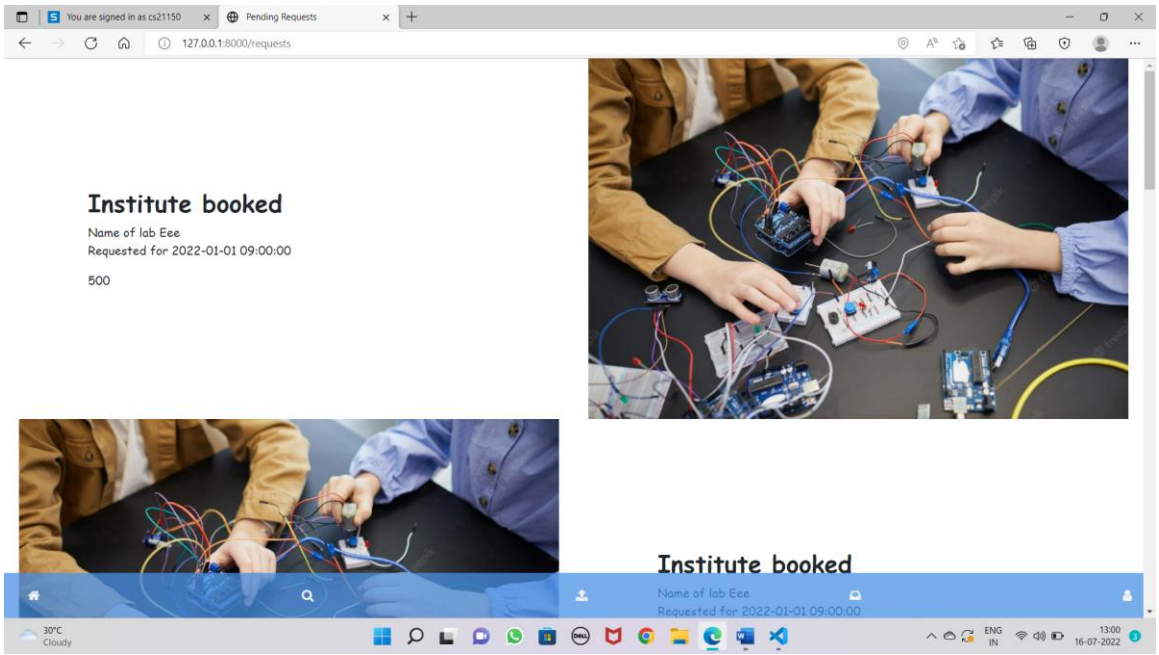
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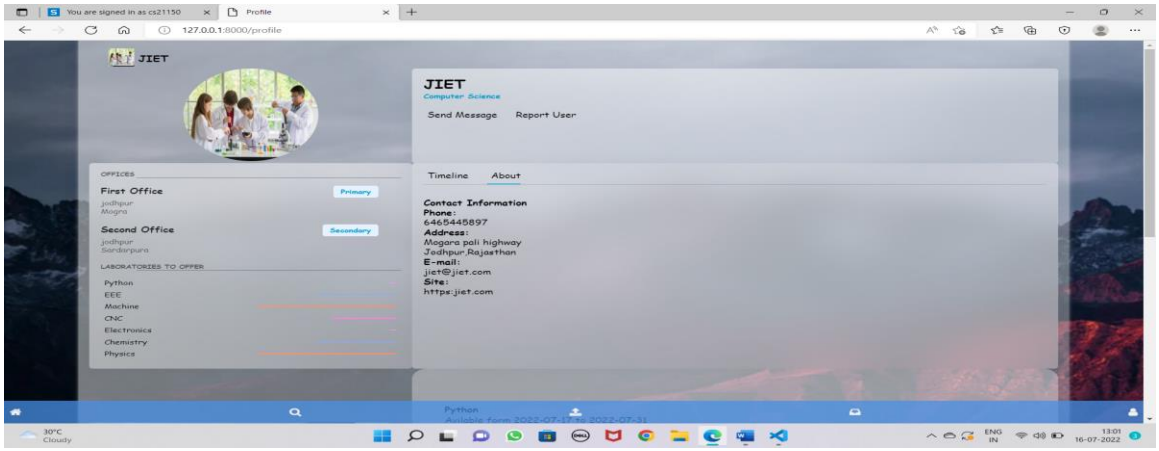
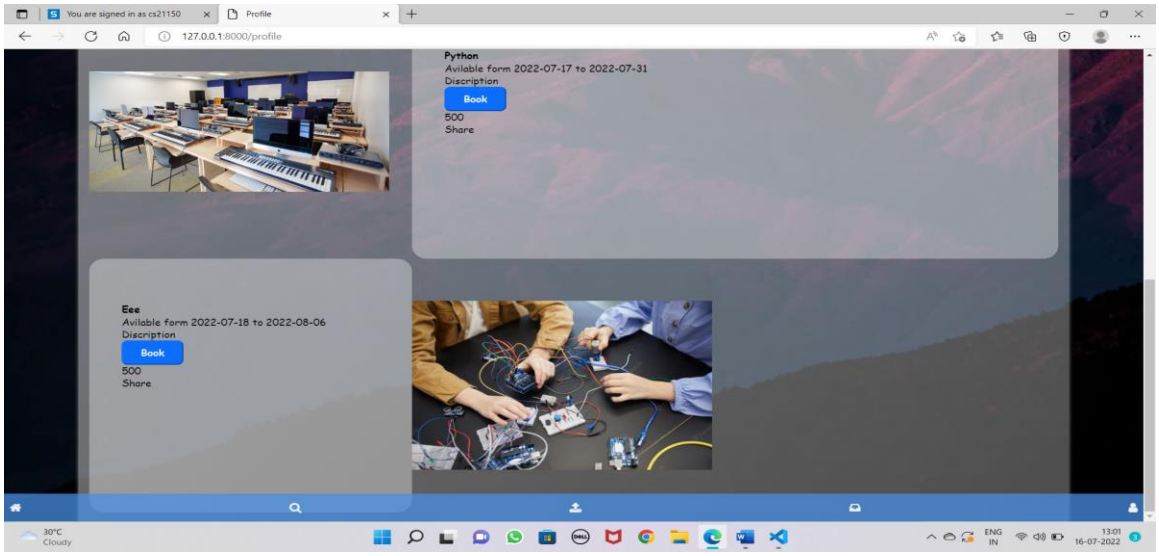
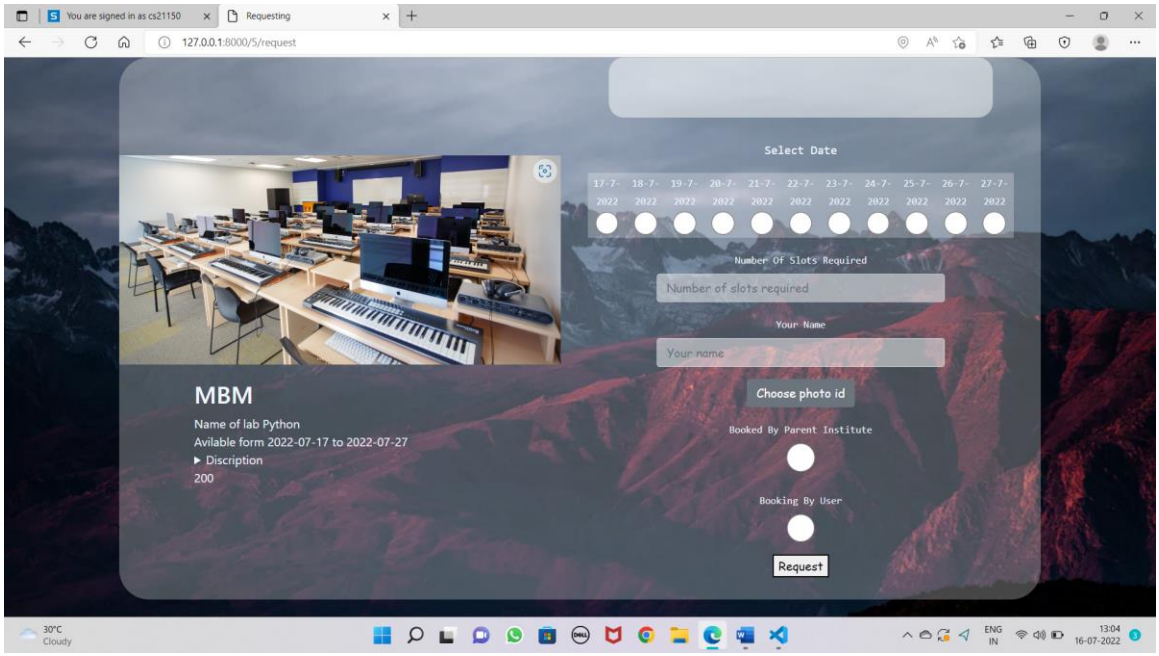
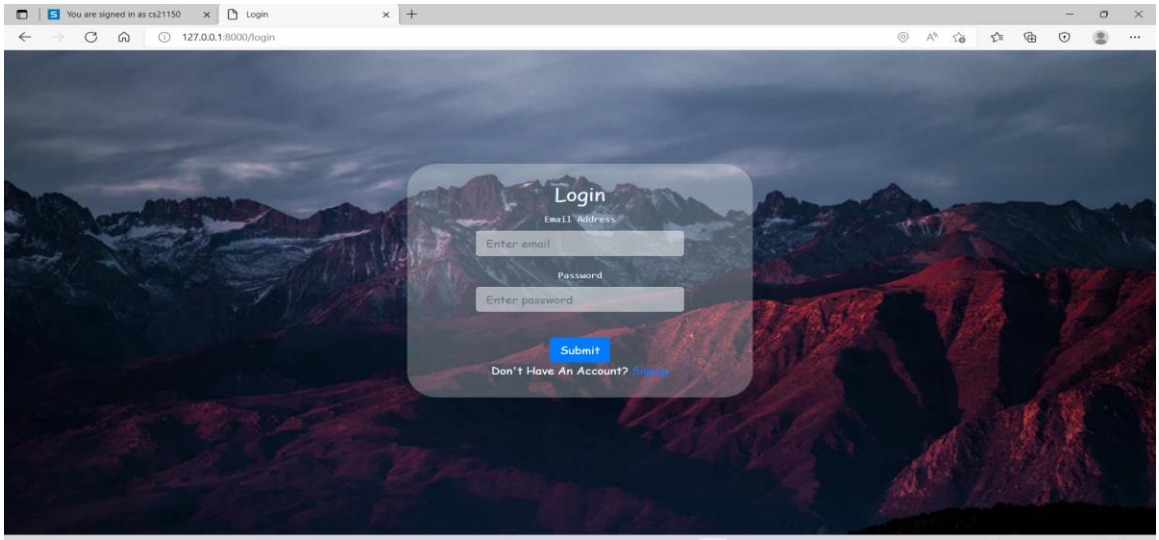
Pending Requests
127.0.0.1:8000/requests
Institute booked
Name of lab Eee
Requested for 2022-01-01 09:00:00
500
Institute booked
Name of lab Eee
Requested for 2022-01-01 09:00:00
30°C
Cloudy
ENG
IN
13:00
16-07-2022


You are signed in as cs21150
Profile
127.0.0.1:8000/profile
JIET
JIET
Computer Science
Send Message
Report User
OFFICES
First Office
Primary
Second Office
Secondary
LABORATORIES TO OFFER
Python
EEE
Machine
CNC
Electronics
Chemistry
Physics
Timeline
About
Contact Information
Phone:
6465445897
Address:
Mogara pali highway
Jodhpur,Rajasthan
E-mail:
jiet@jiet.com
Site:
https:jiet.com


You are signed in as cs21150
Profile
127.0.0.1:8000/profile
Python
Avilable form 2022-07-17 to 2022-07-31
Discription
Book
500
Share
Eee
Avilable form 2022-07-18 to 2022-08-06
Discription
Book
500
Share


You are signed in as cs21150
Requesting
127.0.0.1:8000/5/request
Select Date
17-7-2022
18-7-2022
19-7-2022
20-7-2022
21-7-2022
22-7-2022
23-7-2022
24-7-2022
25-7-2022
26-7-2022
27-7-2022
Number Of Slots Required
Number of slots required
Your Name
Your name
Choose photo id
Booked By Parent Institute
Booking By User
Request
MBM
Name of lab Python
Avilable form 2022-07-17 to 2022-07-27
Discription
200


You are signed in as cs21150
Login
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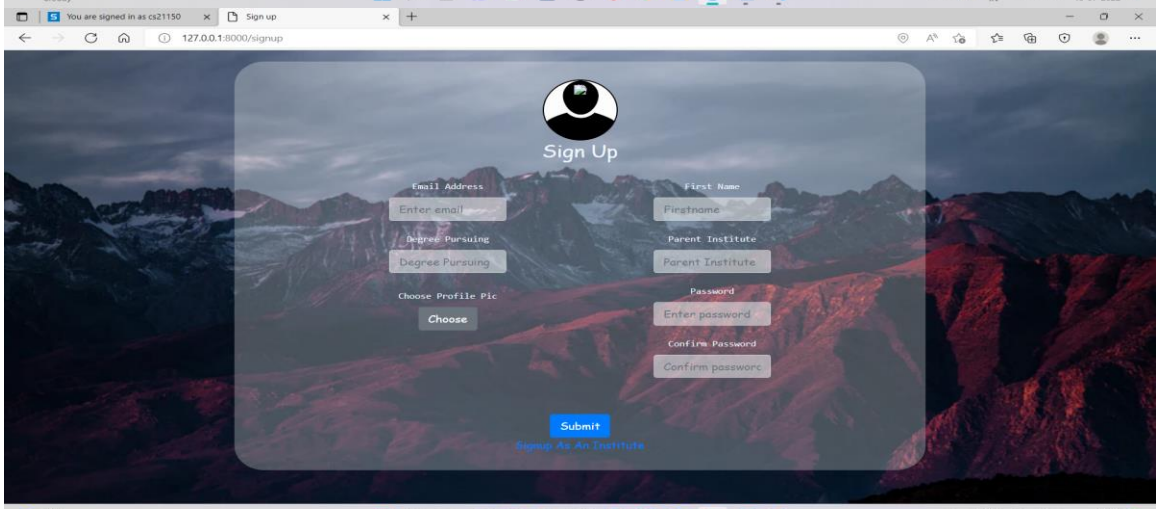
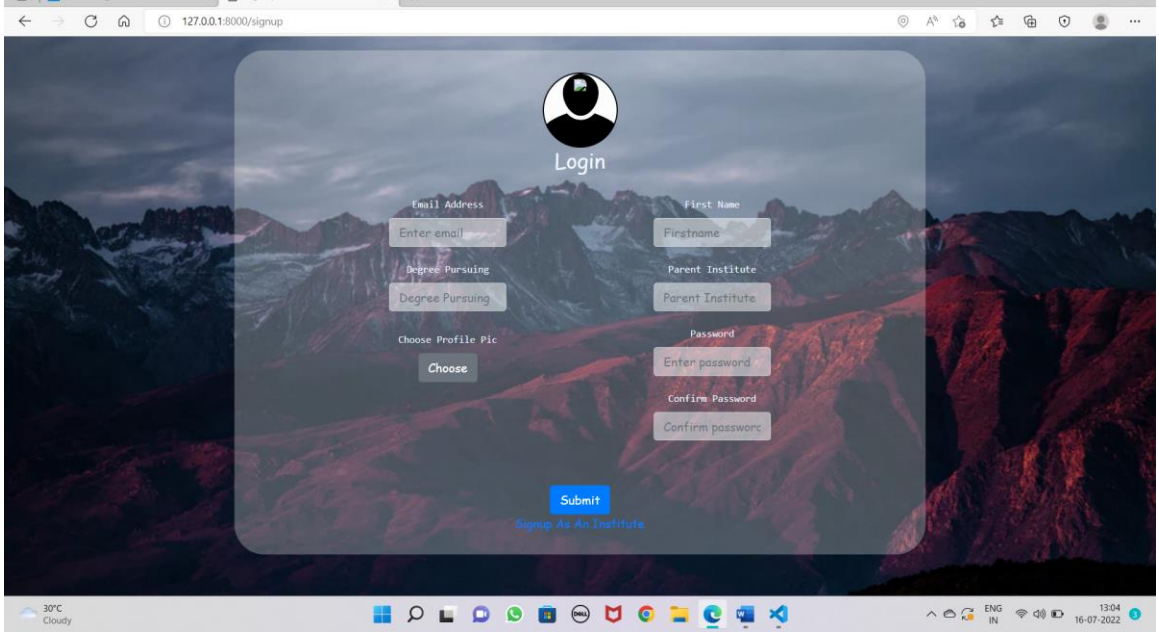
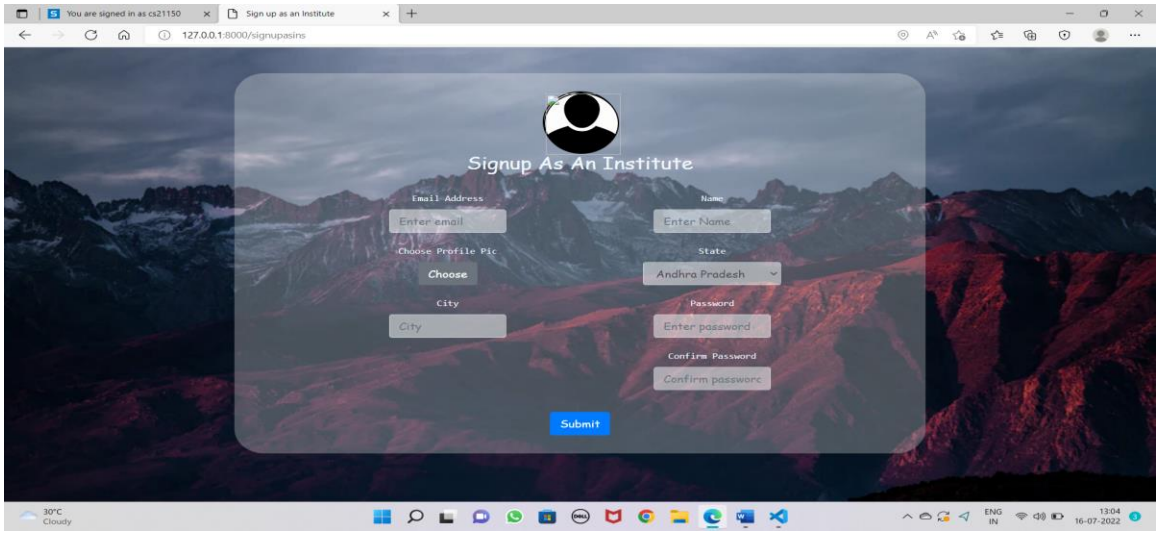
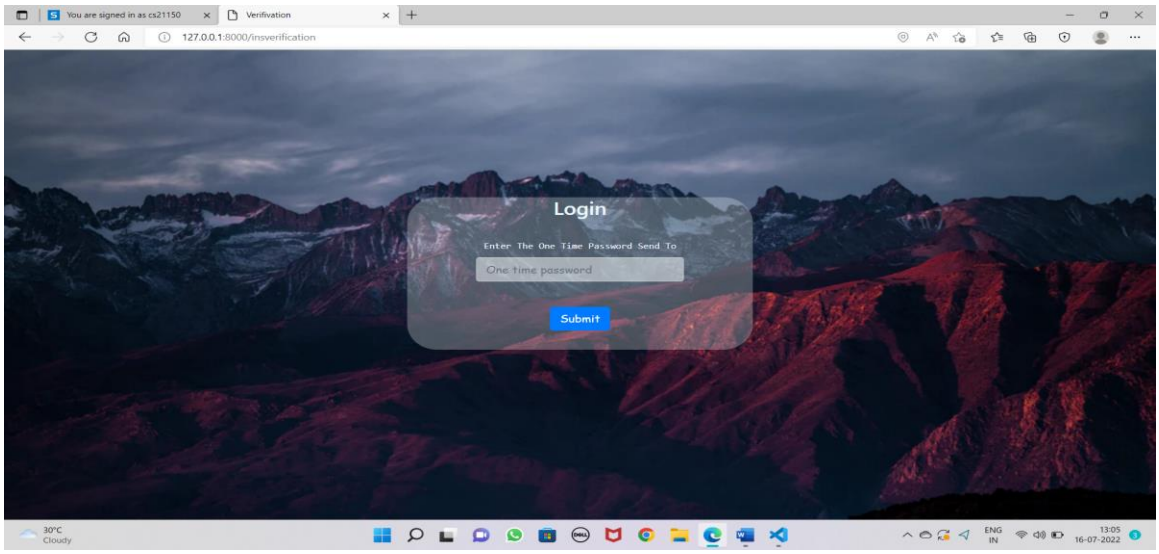
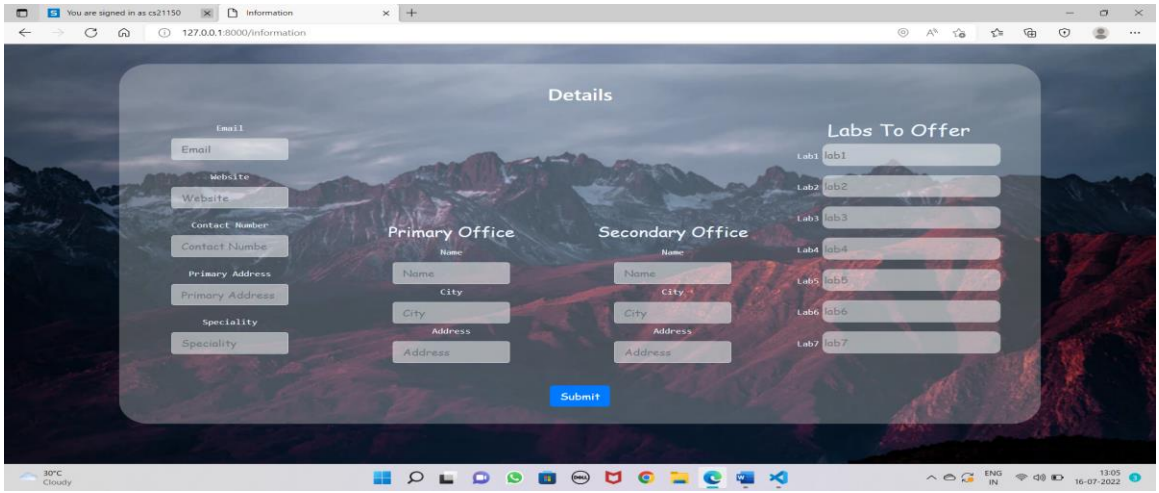
Login
Email Address
Enter email
Password
Enter password
Submit
Don't Have An Account? Signup


You are signed in as cs21150
Sign up
127.0.0.1:8000/signup
Sign Up
Email Address
Enter email
First Name
Firstname
Degree Pursuing
Degree Pursuing
Parent Institute
Parent Institute
Choose Profile Pic
Choose
Password
Enter password
Confirm Password
Confirm password
Submit
Signup As An Institute


You are signed in as cs21150
Sign up
127.0.0.1:8000/signup
Login
Email Address
Enter email
First Name
Firstname
Degree Pursuing
Degree Pursuing
Parent Institute
Parent Institute
Choose Profile Pic
Choose
Password
Enter password
Confirm Password
Confirm password
Submit
Signup As An Institute


Signup As An Institute
Email Address
Enter email
Name
Enter Name
Choose Profile Pic
Choose
State
Andhra Pradesh
City
City
Password
Enter password
Confirm Password
Confirm password
Submit


Login
Enter The One Time Password Send To
One time password
Submit


Details
Email
Email
Website
Website
Contact Number
Contact Numbe
Primary Address
Primary Address
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Speciality
Primary Office
Name
Name
City
City
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Secondary Office
Name
Name
City
City
Address
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Labs To Offer
Lab1
lab1
Lab2
lab2
Lab3
lab3
Lab4
lab4
Lab5
lab5
Lab6
lab6
Lab7
lab7
Submit

4. Applications

Application as per Students perspective

- The students can use this webapp for getting physical experience of the laboratory and interact with real life errors which can't be identifies in virtual labs.
- The students who are not able to go to their university due to issues like quarantine or any kind of personal reason. This webapp will help them to find institutes that will provide them the equipment required for their individual practical.
- The students can use this webapp for attending various workshops on different topics organized all kind of universities and institutes to improve their knowledge and improvise their skills.

Application as per Institute's perspective

- The universities and institutes will use this webapp for advertising their institute and provide service of practical experience to the student which will a source income for them.
- From this webapp the institutes will use their assets which are not in use due to lack of students to generate income.
- This webapp will be the perfect portal for inviting students to the workshops they organize.
- They can keep a record of the student attending their institute for the work shop and the practical sessions.
- The parent university of the students can book slot for their students in a certain institute for practical sessions in other cities.

Features as per student perspective

- The students can easily sign up by email or phone number or email and the verification will be done though one time password send via mail.

- There will a home page as a social media platform where the students can filter institute by the distance between them and the institute and the laboratory they want to attend.
- The student will then select their preferable institute and fill the requirements accordingly if the institution if providing the labs in their preferable time slot, it will also show the slot available in a certain lab.
- When the students will fill the details required and select the time slot they want, the request will be sent to the server and their request will register.
- This section will also have a search option for students to search about the institute they want to know.
- The search results will show the institutes and its geographic location on the map, all the laboratory the institute is providing and the workshop they had organized or are going to organize will be displayed.
- The students get to meet new people and interact with them.

Features as per Institute's perspective

- The institutes can sign up as an institute and will be verified by one rime password send via mail.
- There will be a home page as a social media platform where the institutes can look at the other institutes around them and the laboratory they are providing as a competition.
- The institutes will also have the explorer section where they can get idea from different universities about the creative workshops they are providing to the students.
- This section will also have a search option for research about the option given by different institutes all over the world.
- There will be an upload section for the institutions to upload the details about their laboratory and workshop.
- The institution can post about various activities on the webapp for increasing their recognition among the students.

5. Future Work and Conclusion

- Development of a payment verification method
- Development of a review system
- Fake user detection
- Post updating portal
- Profile editing section
- Detection of cancelation

References:

- Youtube
  i) Backend flask tech with tim youtube
  ii) Frontend code with harry

- Books
  1) Think in python by Allen B. Downey
  2) Dive into html5 by mark pilgrim
  3) SQLite database design and management by Riaz Ahmed
- Welcome to Flask — Flask Documentation (2.1.x) (palletsprojects.com)
- Flask-SQLAlchemy — Flask-SQLAlchemy Documentation (2.x) (palletsprojects.com)
- Flask-Login — Flask-Login 0.6.1 documentation
- Getbootstrap.com
- W3school/javascript