Software Design Specification

Version 1.0

Status: Draft

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Content

1. Introduction:

1.1 Purpose

The purpose of this document is to give detailed information pertaining to the design for " Course-wise attendance management " project applications. The

applications described here include web application namely “ CDMS “ - Course database management system and android based application “ Remote Attendance Marker ”.

It contains different diagrams convolving various aspects of the project. Each of them provides the intricacies of the project which would be implemented.

The project enables admin to add various courses, allow the instructor to float various courses. Students could request different courses. Attendance in each of the class would be done remotely by taking photographs of the class and by facial recognition services provided by the external API, we mark the attendance accordingly. The following diagram shows the outlay of the work.

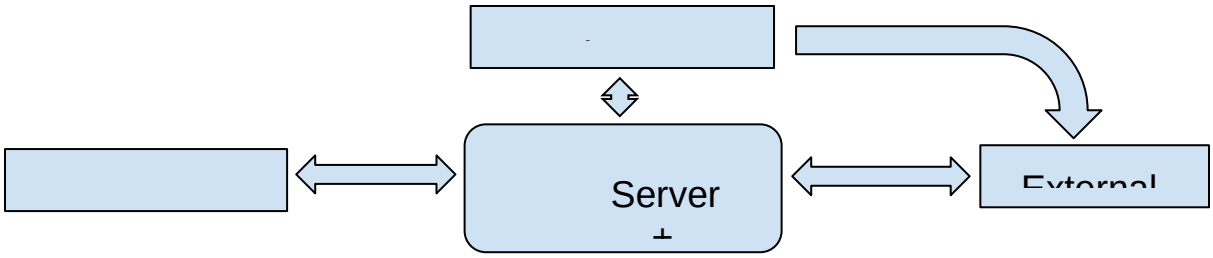
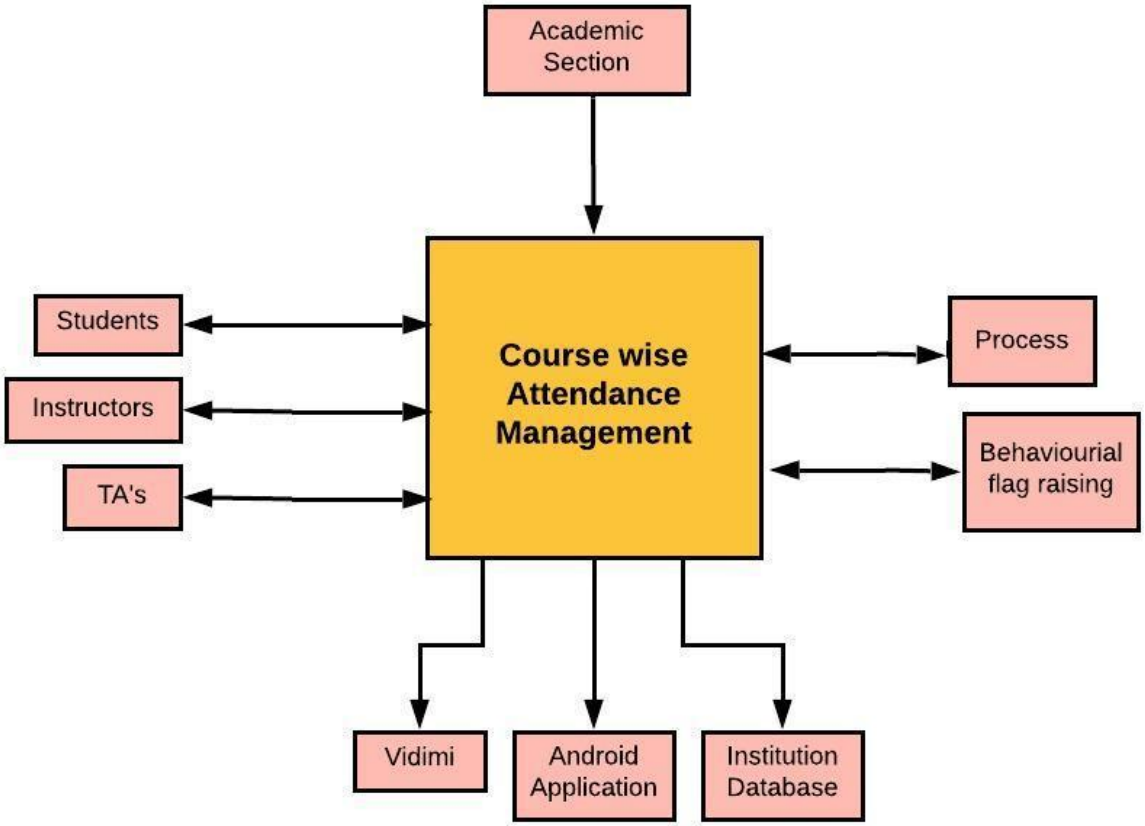


Figure 1: Basic outlay

2. **Context diagram :**



Context Diagram

Figure 2: Context Diagram for the project

3. **Logical structure diagram :**

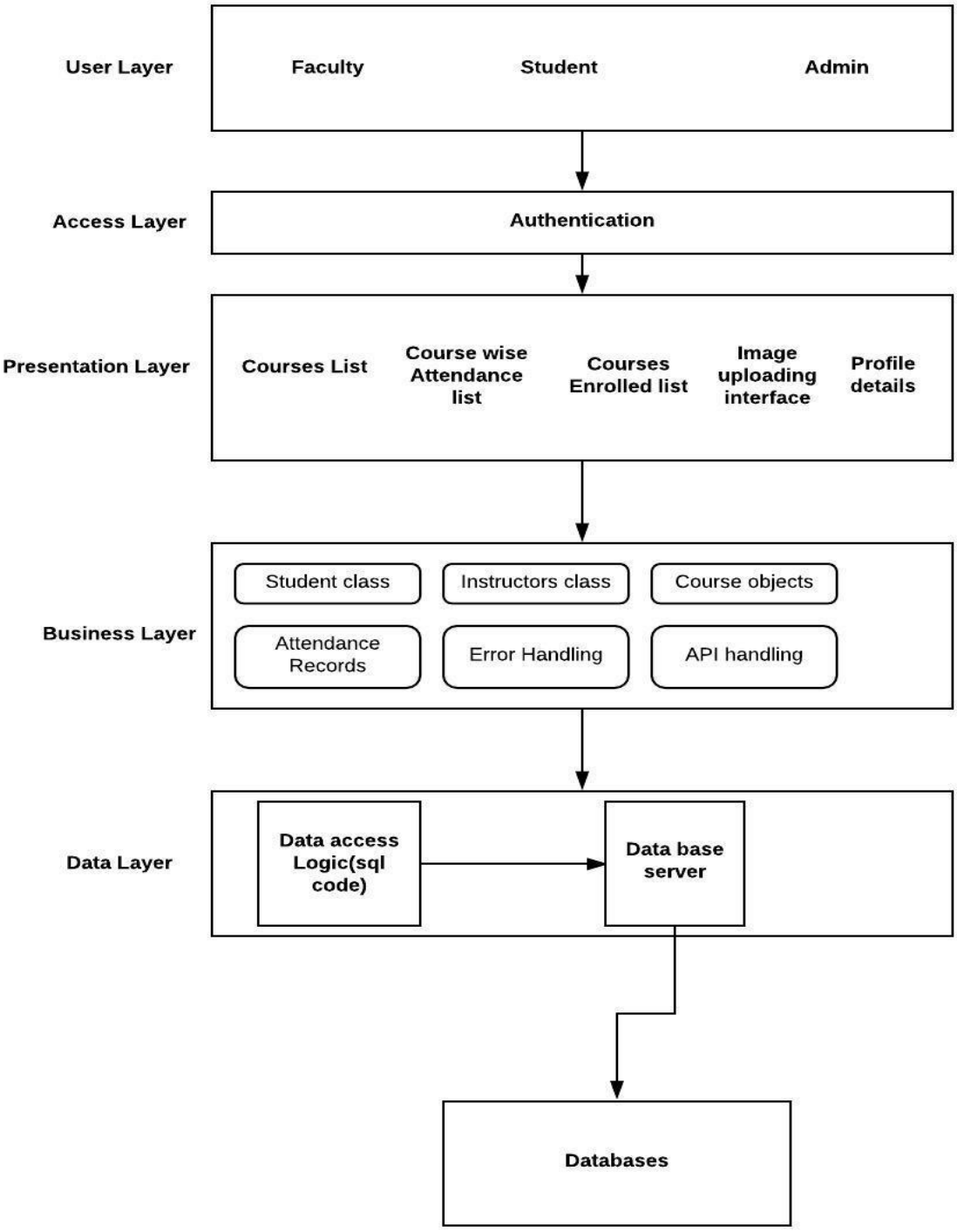


Figure 3: Logical Structure Diagram

4. **Data Flow Diagram:**

DFD 0 level:

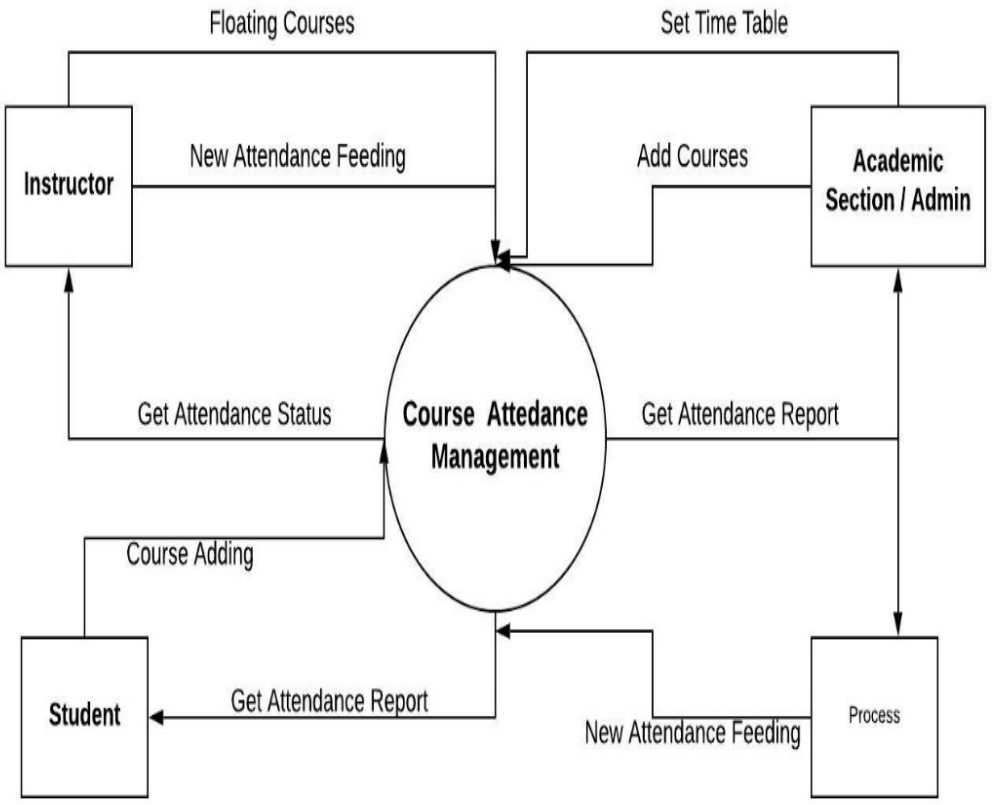


Figure 4: DFD level 0

DFD 1 level:

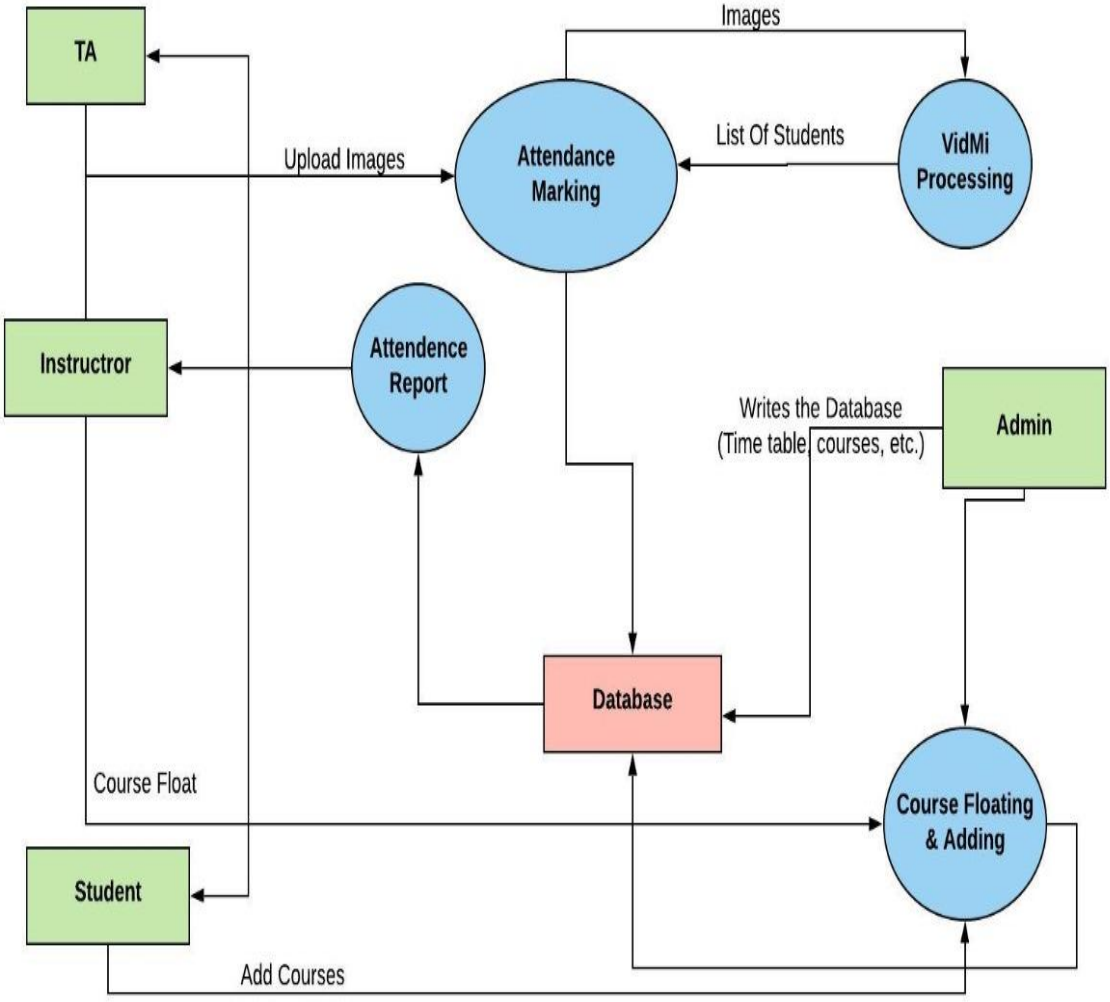


Figure 5: DFD level 1

DFD 2 level:

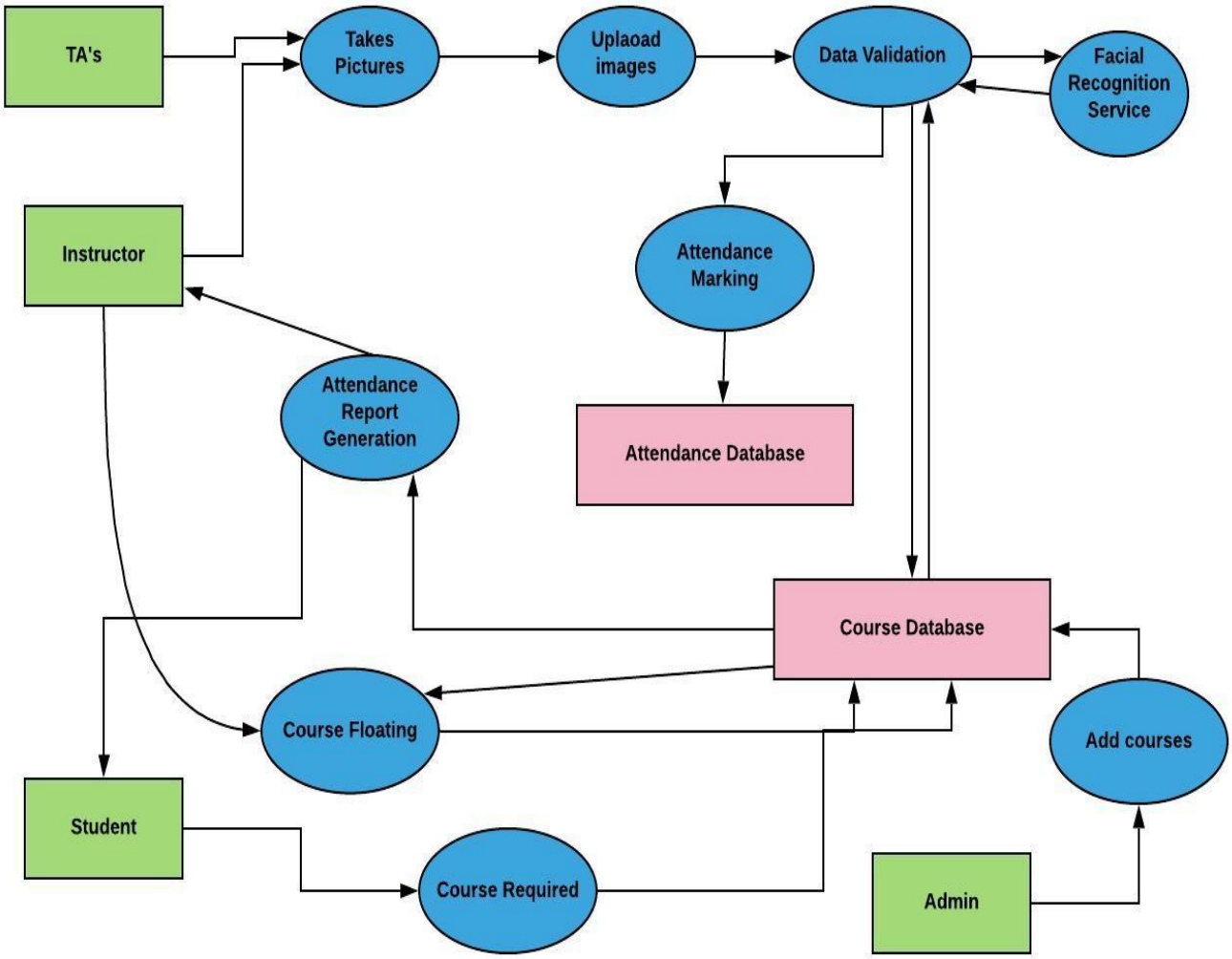
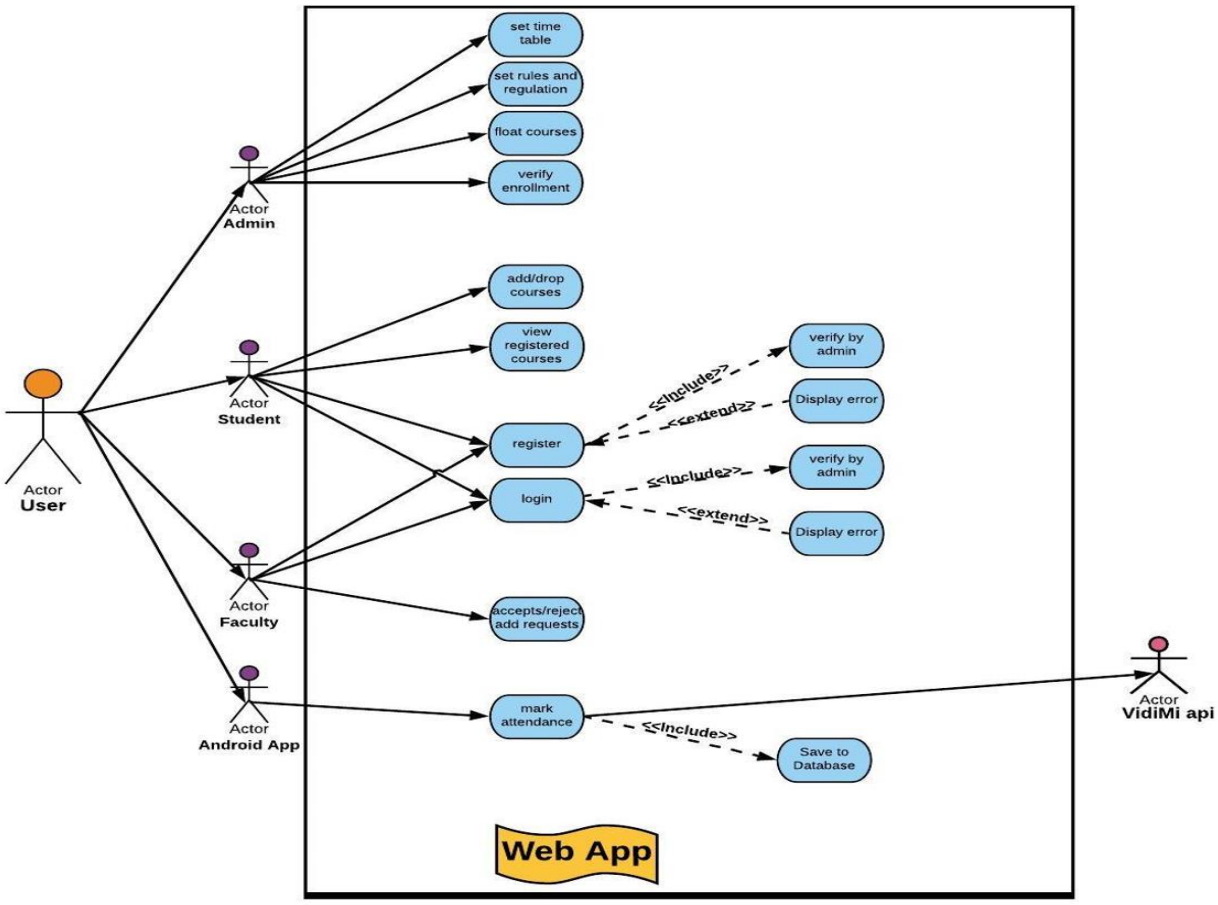


Figure 6: DFD level 2

5. UML diagrams:

Behavioral Diagram:

1. Use case:



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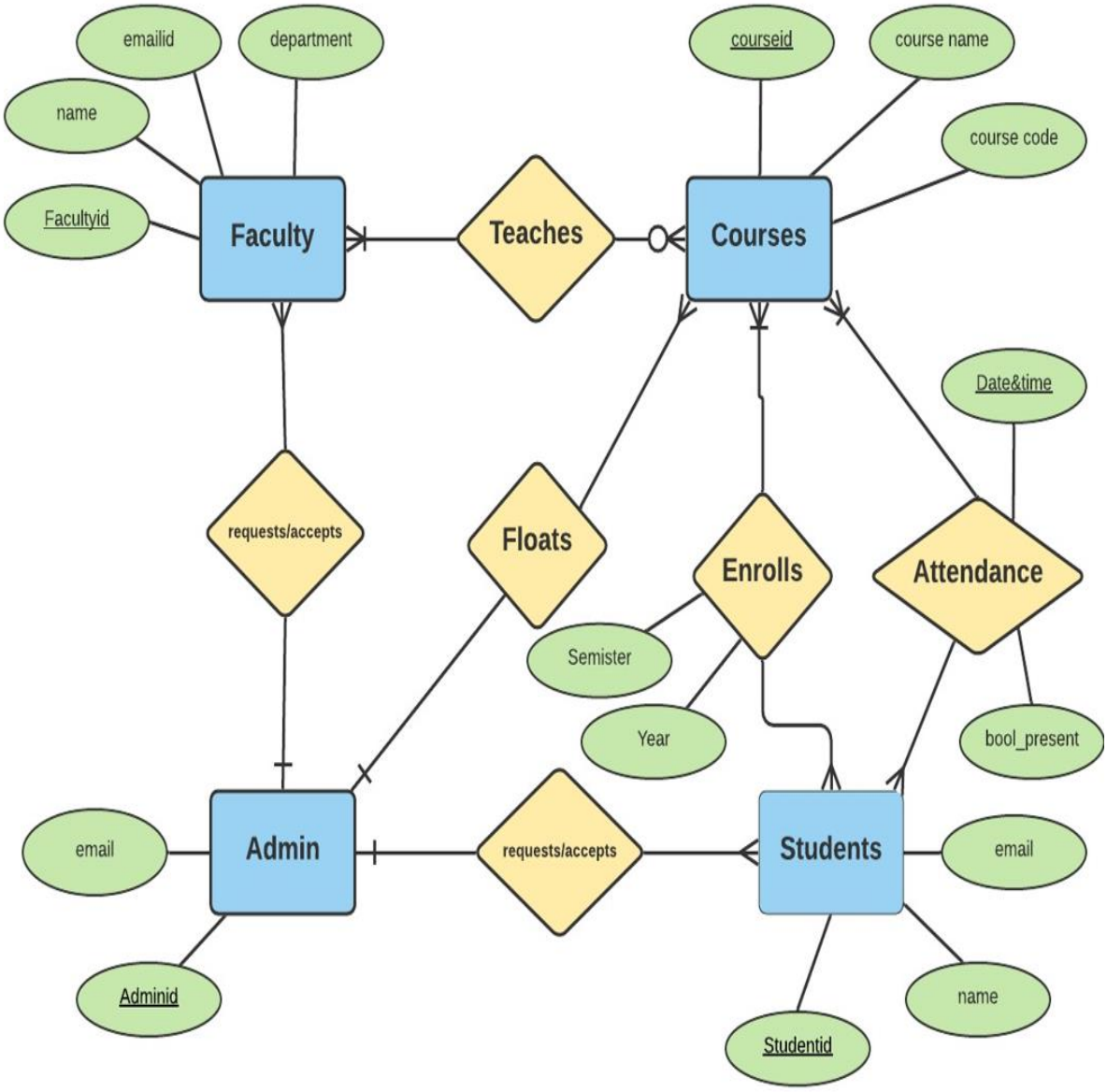
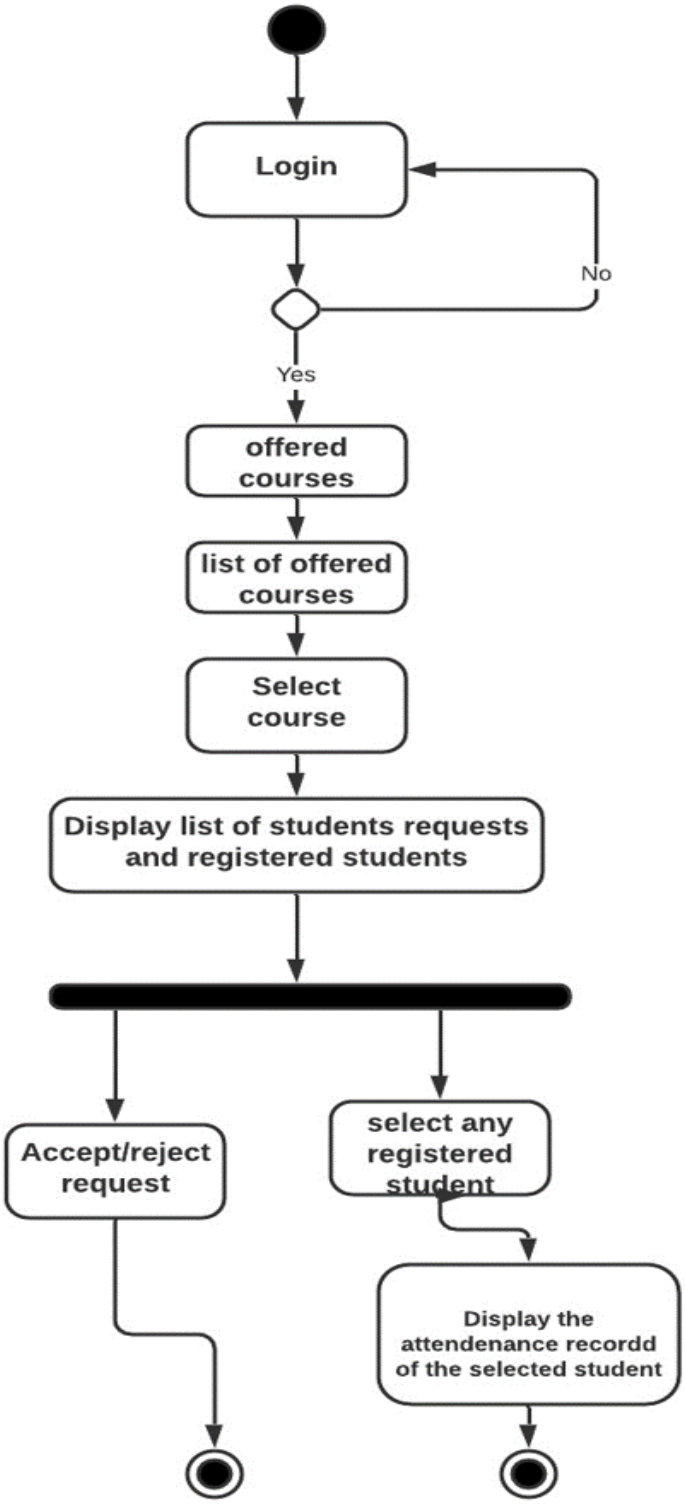
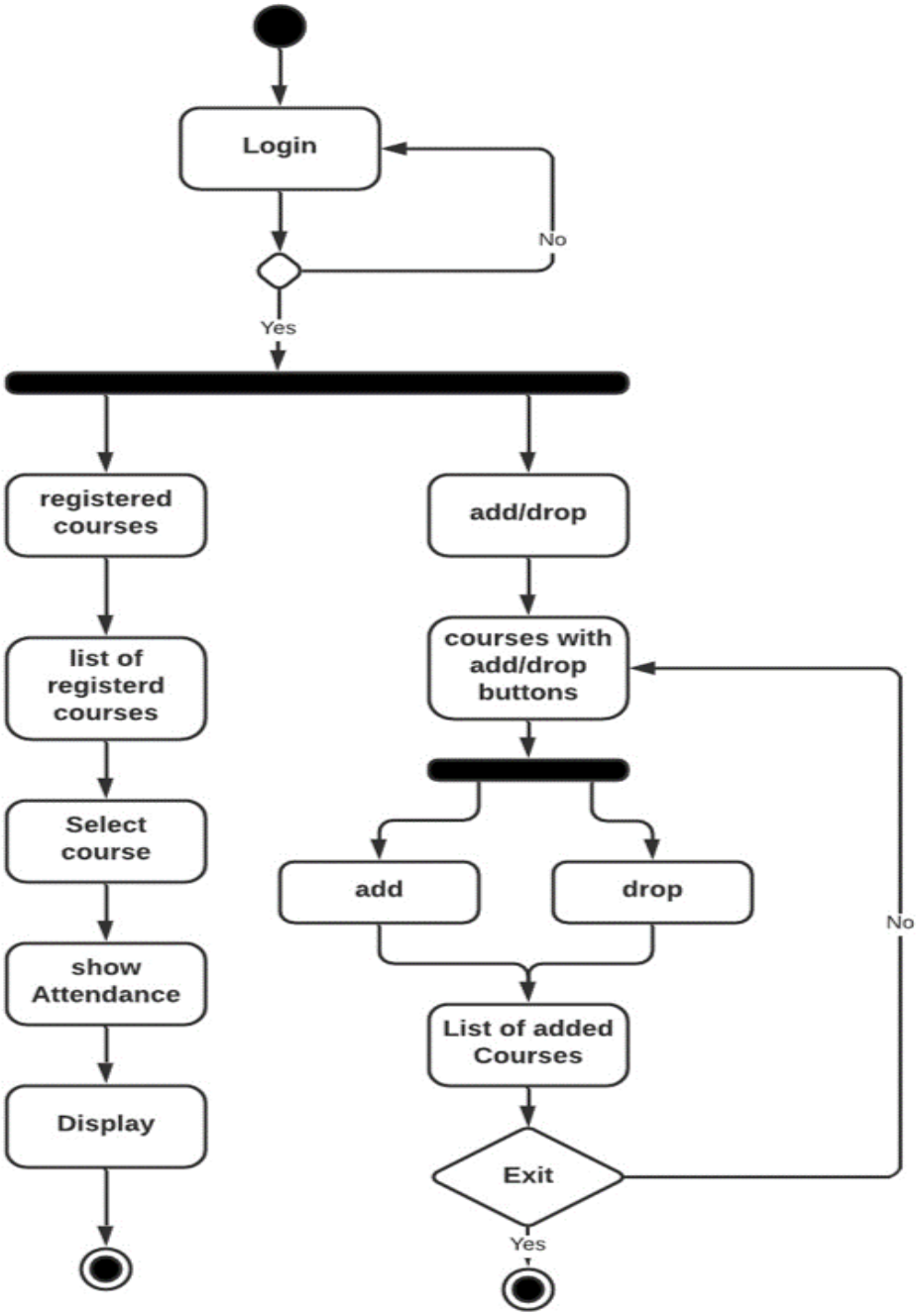
ER Diagram:


emailid
department
name
Facultyid
Faculty
Teaches
courseid
course name
course code
Courses
Date&time
requests/accepts
Floats
Enrolls
Attendance
Semister
Year
bool_present
email
Admin
requests/accepts
Students
email
Adminid
Studentid
name

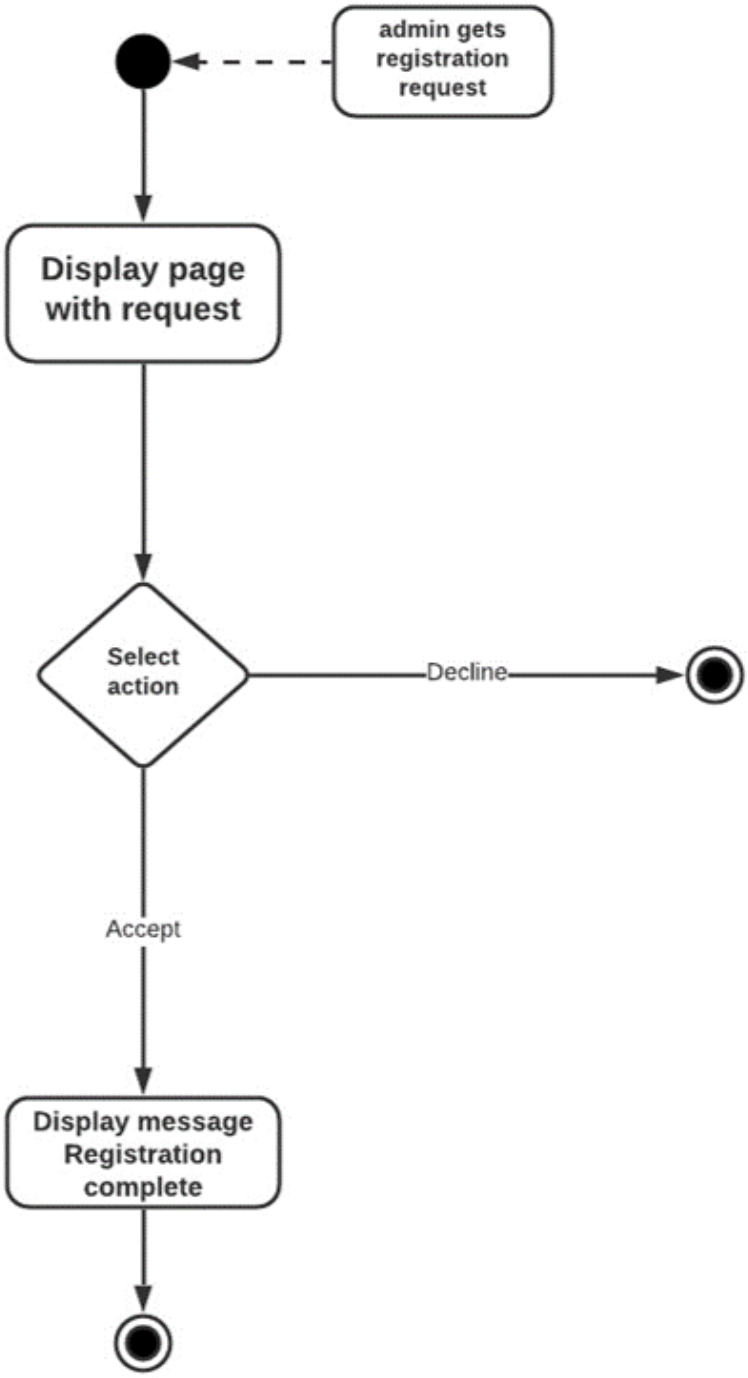
Activity Querying Courses for faculty



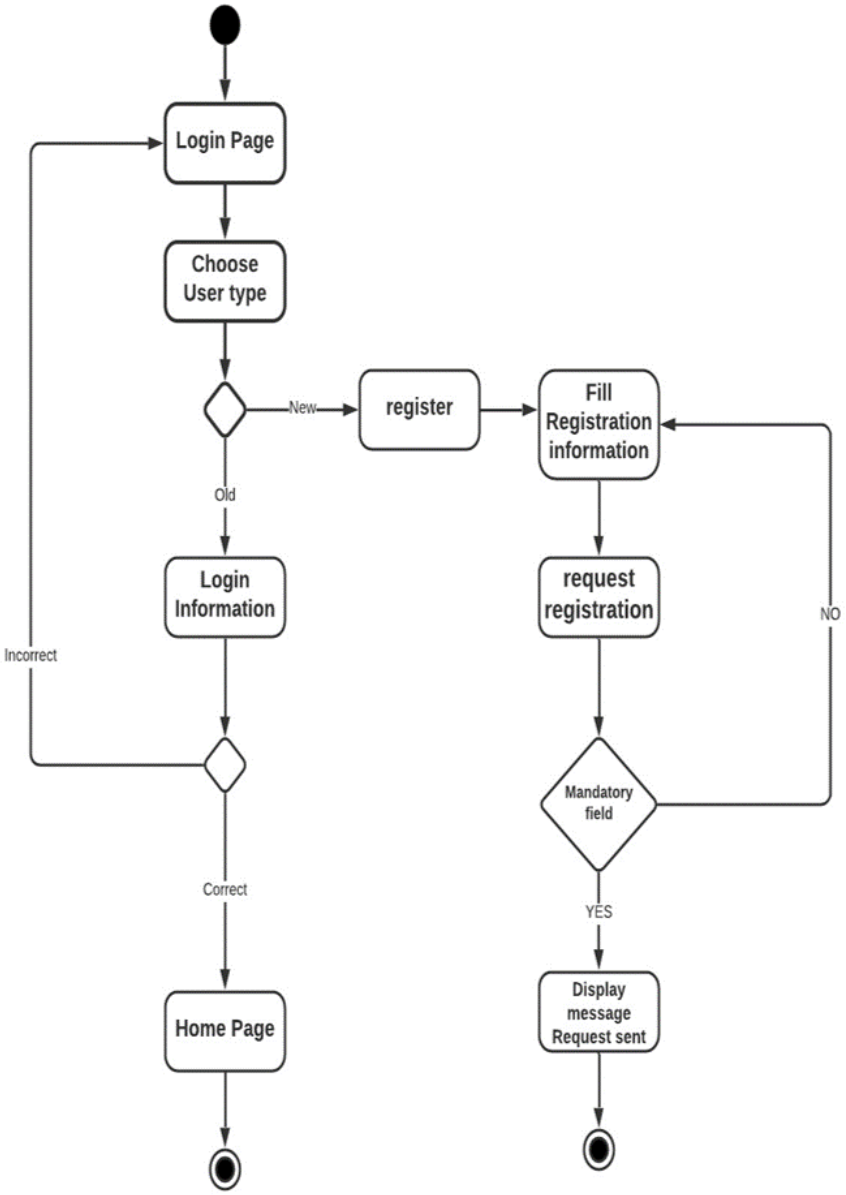
Activity Diagram for Querying courses



Registration Approval

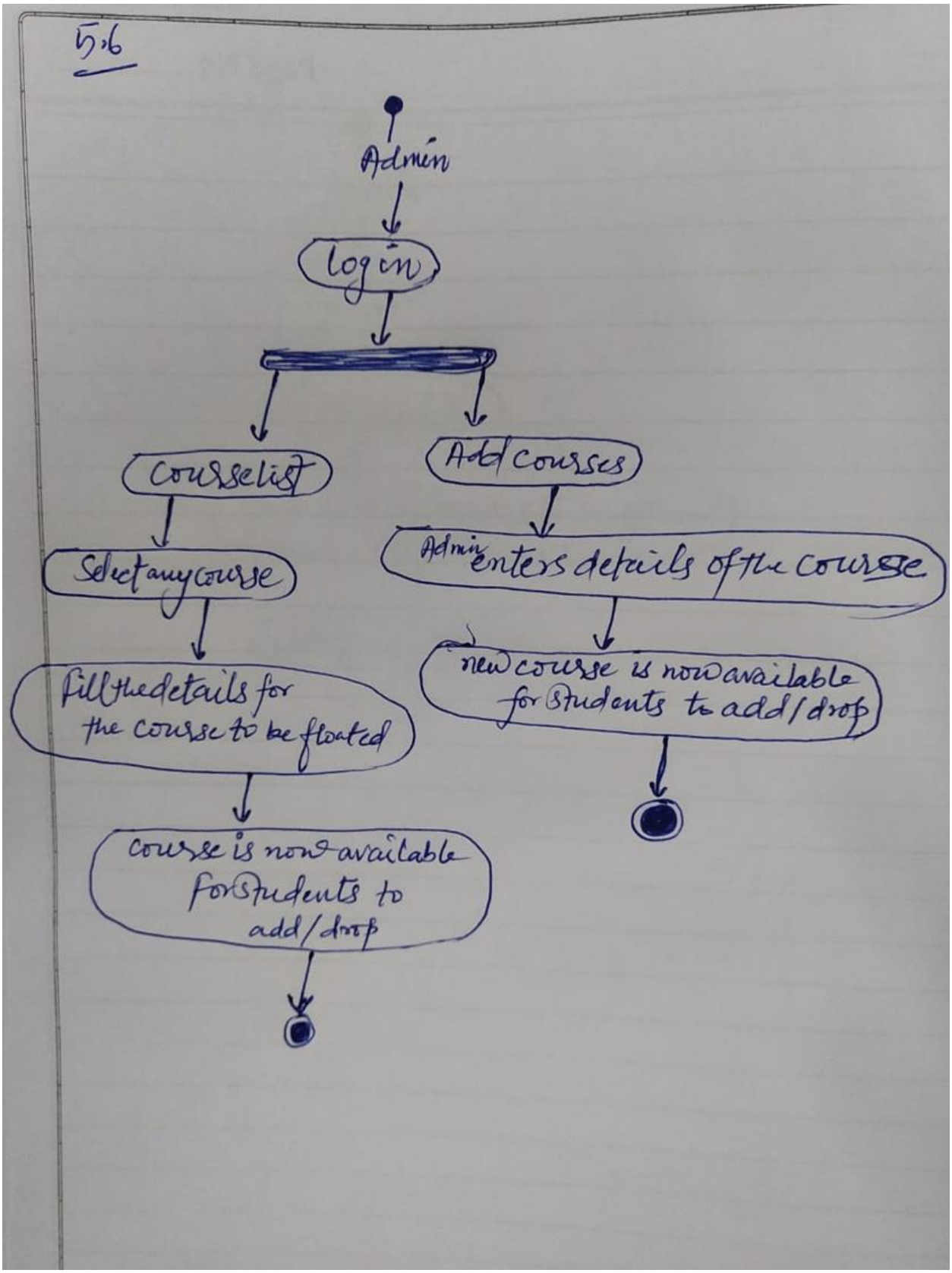


Activity Querying Courses for faculty

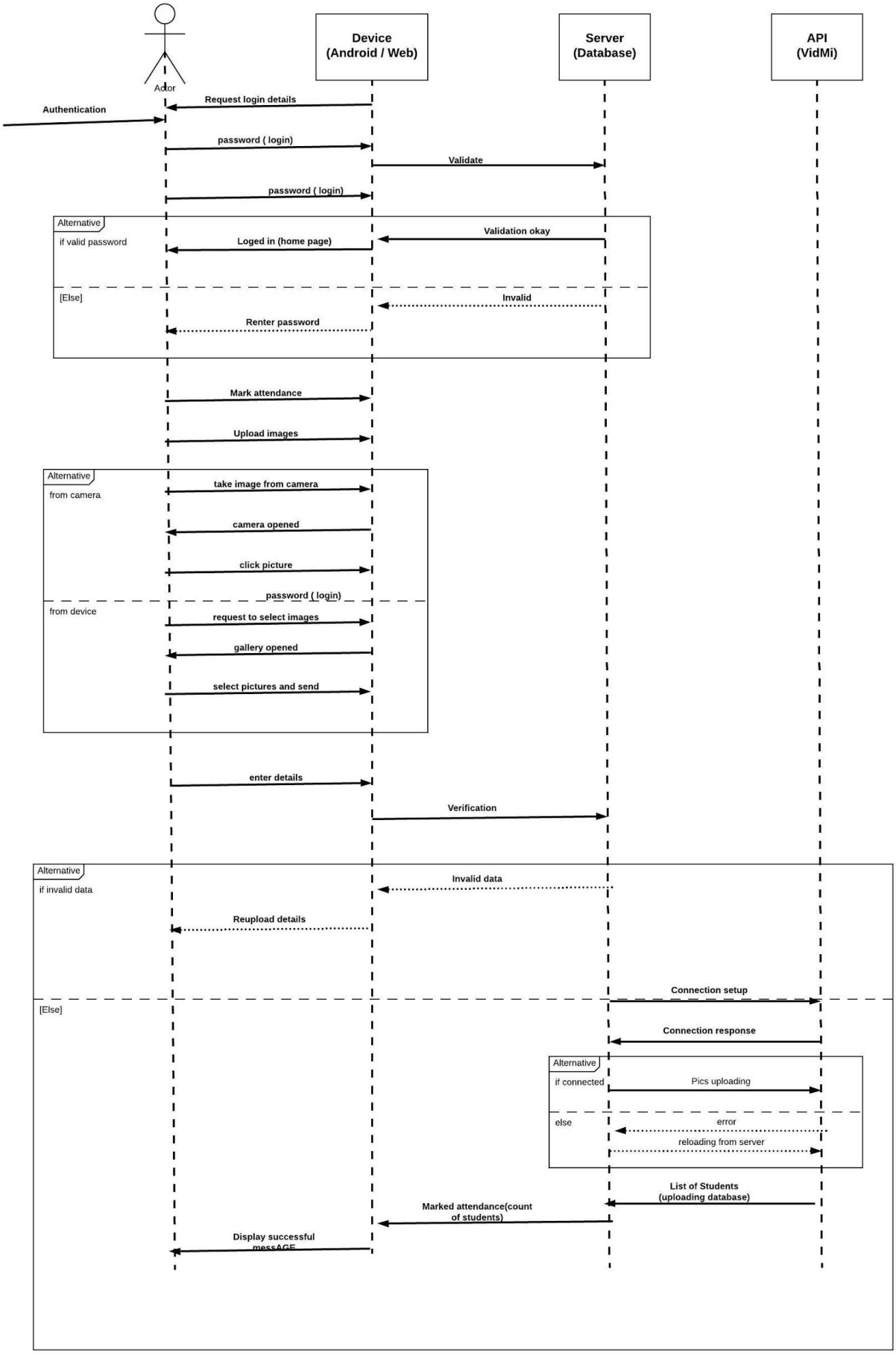


Activity Assigning List of courses ;

5.6

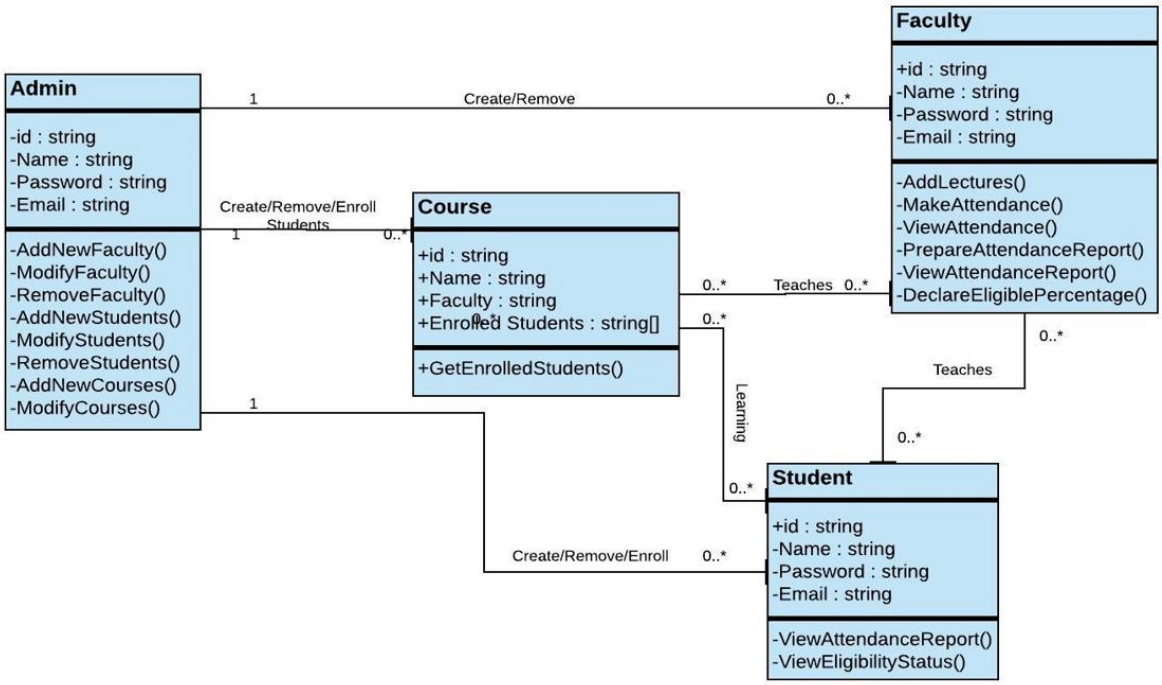

Admin
login
Courselist
Add courses
Select any course
Admin enters details of the course
fill the details for the course to be floated
new course is now available for students to add/drop
course is now available for students to add/drop

Sequence Diagram:


Actor
Device (Android / Web)
Server (Database)
API (VidMi)
Authentication
Request login details
password (login)
Validate
password (login)
Alternative
if valid password
Validation okay
Loged in (home page)
[Else]
Invalid
Renter password
Mark attendance
Upload images
Alternative
from camera
take image from camera
camera opened
click picture
password (login)
from device
request to select images
gallery opened
select pictures and send
enter details
Verification
Alternative
if invalid data
Invalid data
Reupload details
Connection setup
[Else]
Connection response
Alternative
if connected
Pics uploading
else
error
reloading from server
List of Students (uploading database)
Marked attendance(count of students)
Display successful messAGE

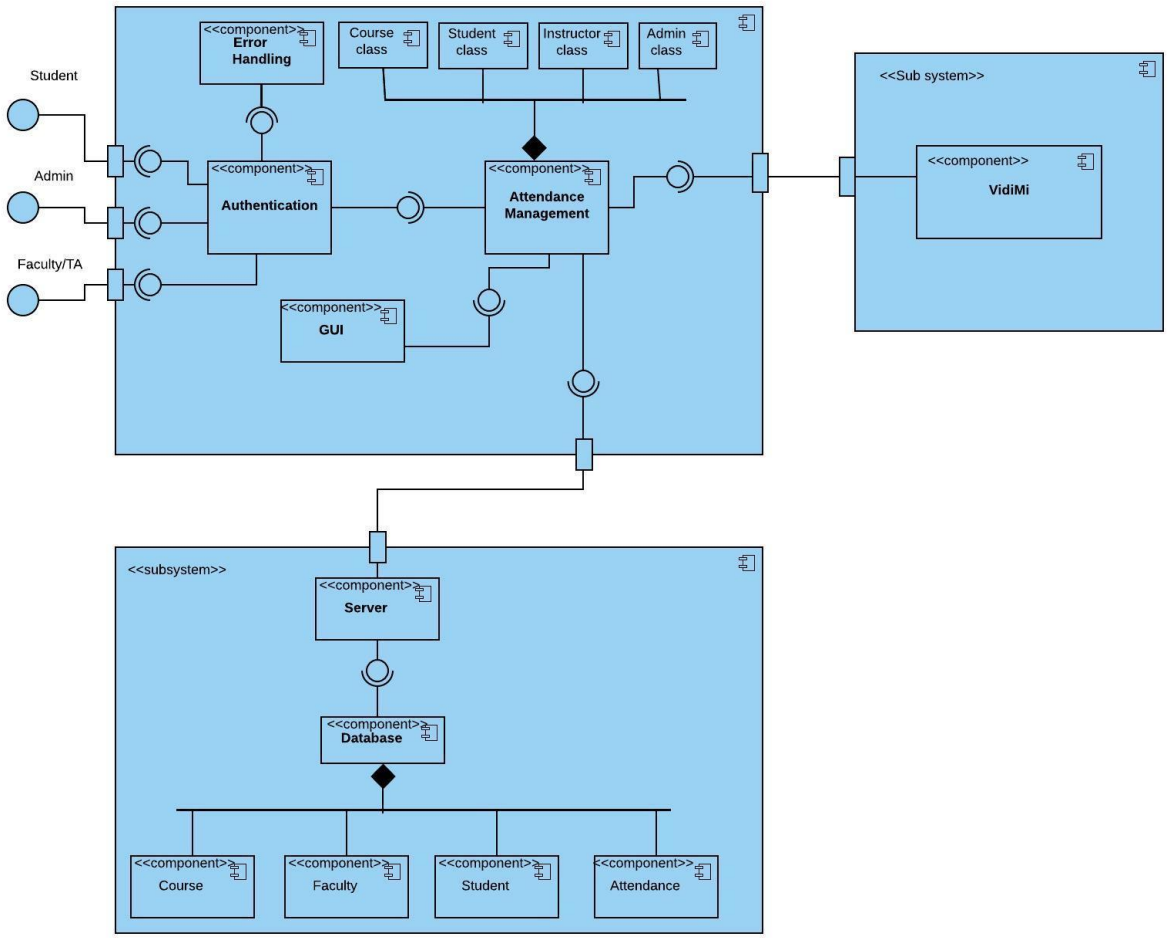
Structural Diagram:

Class Diagram:

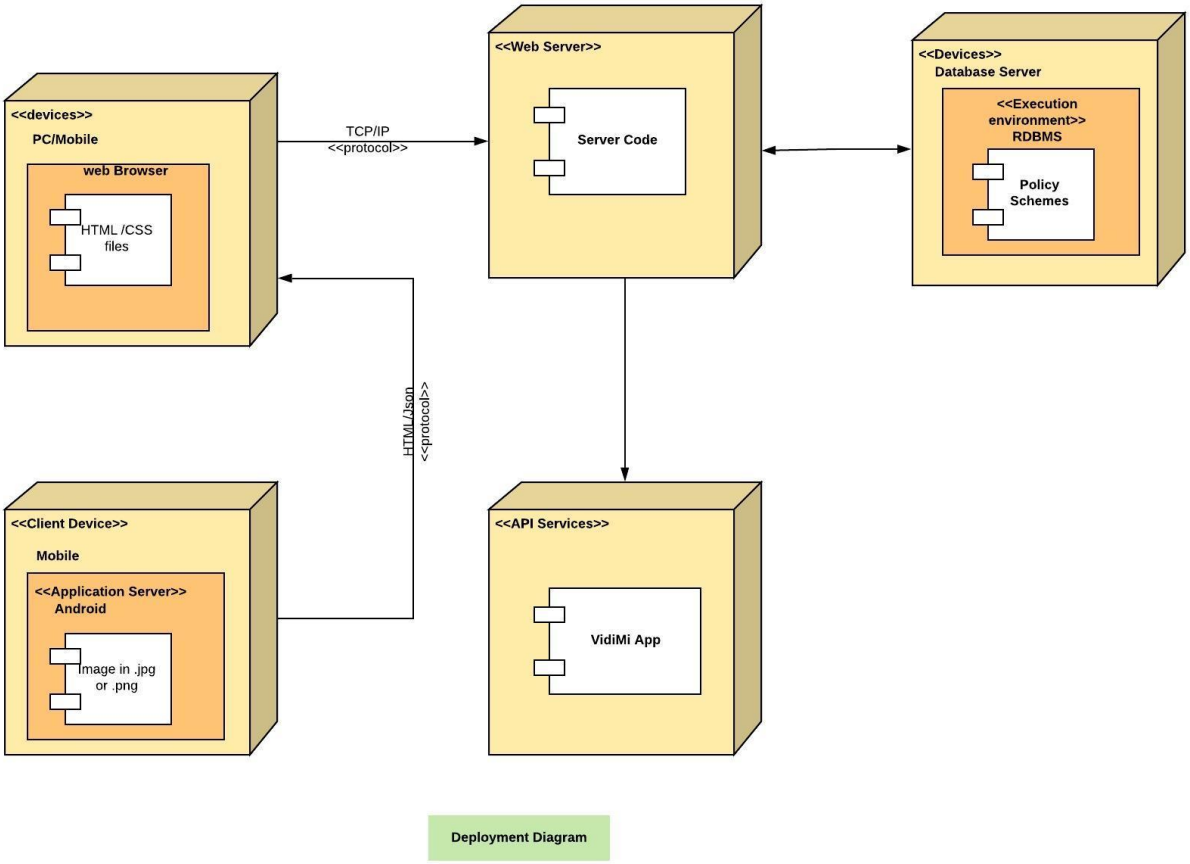


Class Diagram

Component Diagram:



6. Deployment diagram:



7. **Discussion:**

Why Python is chosen in the design over other languages for backend code?

- Our team is acquainted with coding in python, so It would make a better quality of code would be assured by working in python.

- We have experience with working in Django framework which is based on python, as part of the project before.
- Python has a diverse amount of libraries which would become handy.
- Python code has better readability, hence maintenance, when deployed, would be simpler.

Pros:
Has better libraries, better readability, better-debugging capability.
Cons:
Generally considered slower.
Prone to runtime error.
Developers mainly are acquainted with Java rather than python, Hence realtime maintenance is slightly costly.

14.2 Why Django over other python based Frameworks?

- Django has better integrations with various databases like PostgreSQL, the one we are planning to implement on.
- Django seems to be better scalable, which is required considering that this project would be implemented on the institution level. Also, it has greater processing speeds for any requests.
- Django has better security features, ensuring that the system is not easily prone to any attacks.
- Our team has experience working in this framework in making a project.

Pros:
Scalable, secure, widely accepted
Runs in almost all Operating Systems including Linux(various flavours) , windows
Cons:
Has monolithic architecture, Not many Django based Developers

Why Java for Android application?

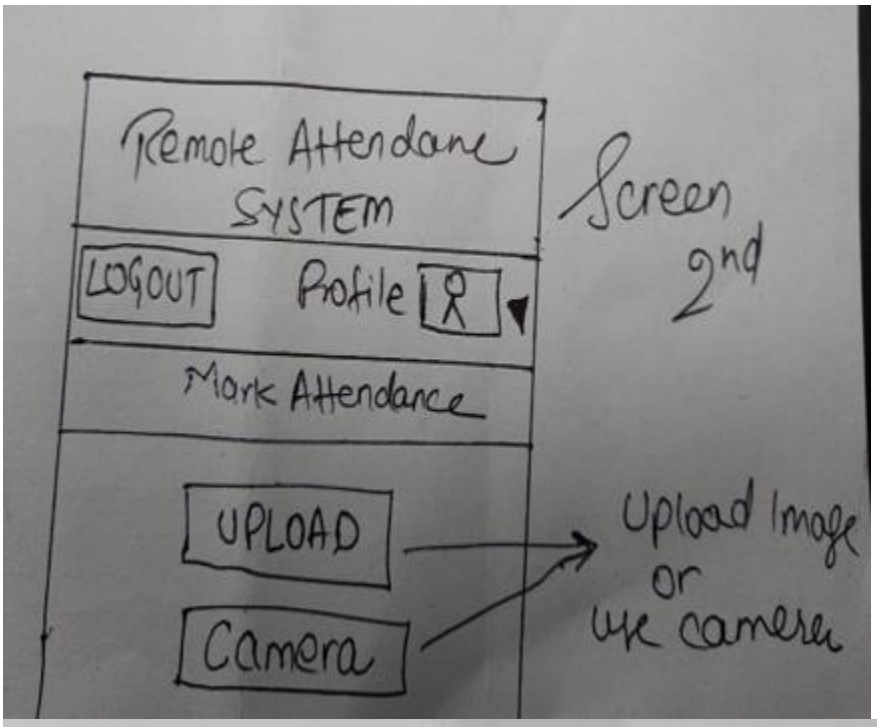
- The features offered in android studio for developing java based application would aid developers in fastening the process of writing code.
- Different Java libraries are already present in the device, hence no need to pack extra code in the deployed application.
- Familiarity with Java ensures that the quality of the code is better and cleaner.

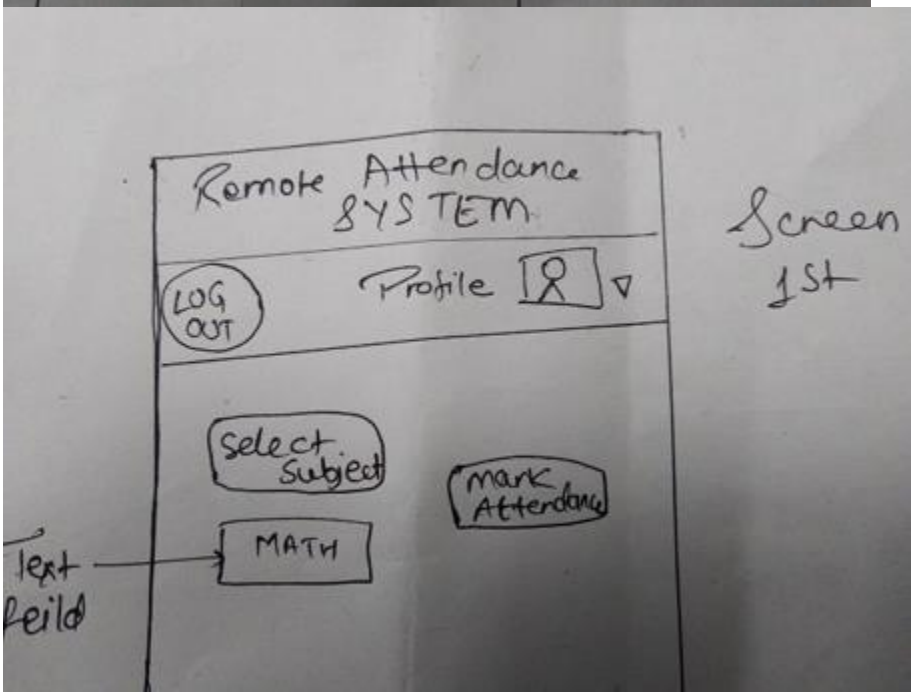
Pros:
Coupled with above-mentioned points, Java is tried and tested language.
We could target wider android versions, without taking care of each version.

Cons:
Not cross-compatible. Flutter would have ensured that the same code could be deployed both on android and iOs based platforms.

Logical Interface Design:

Mobile App:


Remote Attendance SYSTEM
LOGOUT
Profile
Mark Attendance
UPLOAD
Camera
Upload Image or use camera
Screen 2nd


Remote Attendance SYSTEM
LOG OUT
Profile
Select Subject
Mark Attendance
MATH
text feild
Screen 1st