

Elab System

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P.E.S's Modern College Of Engineering



Contents

- Project Introduction
- Company profile
- AS-IS system(Existing System)
- AS-IS system limitations
- TO-BE system (Proposed System)
- Module Hierarchy Diagram
- Entity Relationship Diagram
- Data Flow Diagrams(if applicable)
- All UML Model(Use case,Sequence,Activity,class etc.)
- Data Dictionary
- Screen layouts
- Reports
- Limitations & future Enhancements

Project Introduction

- The ELab is built on the premise that teaching lab experiments online may be done more effectively and inexpensively. Students without access to physical laboratories or in situations where equipment is unavailable due to scarcity or high cost can also be given access to the labs. As well as bridging the digital divide and geographic boundaries, this enables them to compete with pupils at schools with richer resources. The experiments are accessible at any time and from any location, eliminating the temporal restrictions associated with having limited access to a physical lab.

Company Profile

- Abhinav DigiCompSoft Services Pvt. Ltd., 915, Satyaniwas, Near Raut Baug, Dhankwadi, Pune 411043, www.abhinavdcs.com
- Foundation Year – 2012
- Services – Websites - Responsive static HTML, Wordpress, e-commerce (WooCommerce, Magento, Prestashop).
Mobile Apps - Native Android and native iOS apps, Flutter Apps.
Cloud based solutions - CRM, Payroll, Inventory & Invoice, 3D Modelling, MIS.
- Products – AbhinavMIS, CRM, DigiInvoice, DigiTime
- Clients – Matrix Solutions, Lucoled NV (Netherlands), Cosign NV (Belgium), Pooja Communications, Abhinav Education Society (Pune).

AS-IS Sysyem

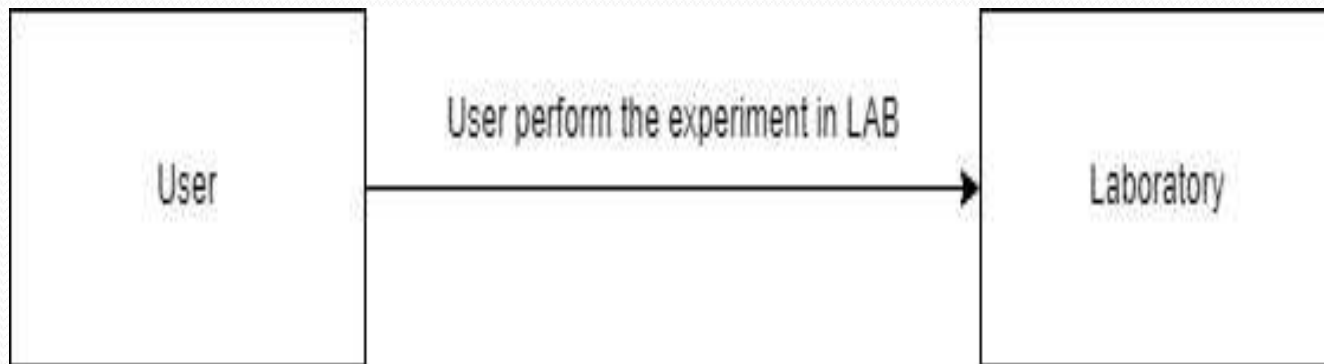


fig:- 1 AS - IS System

AS-IS system limitations

- Limited experimentation: Some AS-IS systems may not allow for a wide range of experimentation or may only support a limited number of experiments. This could be due to a lack of equipment or software capabilities, or the need for expensive materials that are not readily available.
- Inadequate data collection: The current system may not be equipped to collect and store data from experiments, which can be a valuable resource for both students and instructors.
- Limited scalability: If the current AS-IS system is not scalable, it may not be able to support a growing number of students or experiments. This could result in slow or unresponsive system performance, or the need to invest in costly upgrades or infrastructure.

TO-BE System

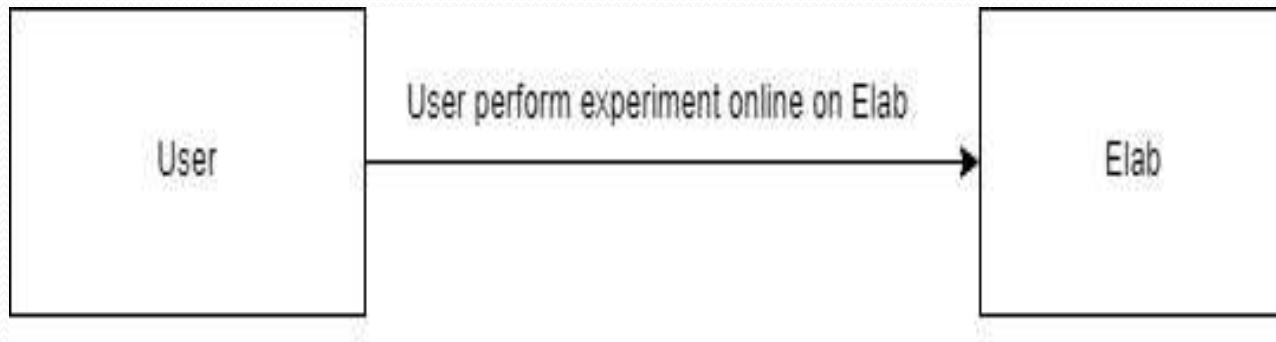
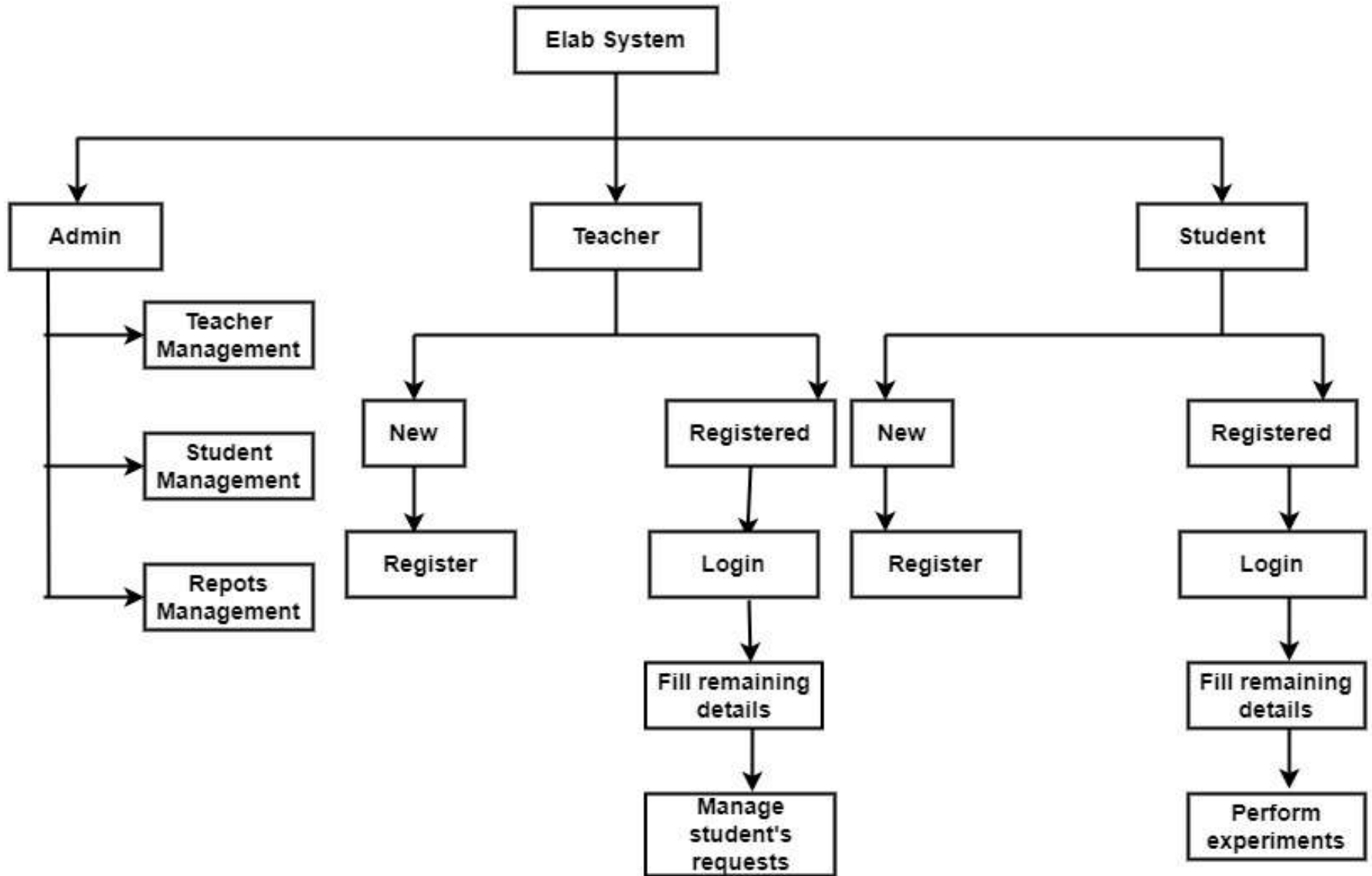
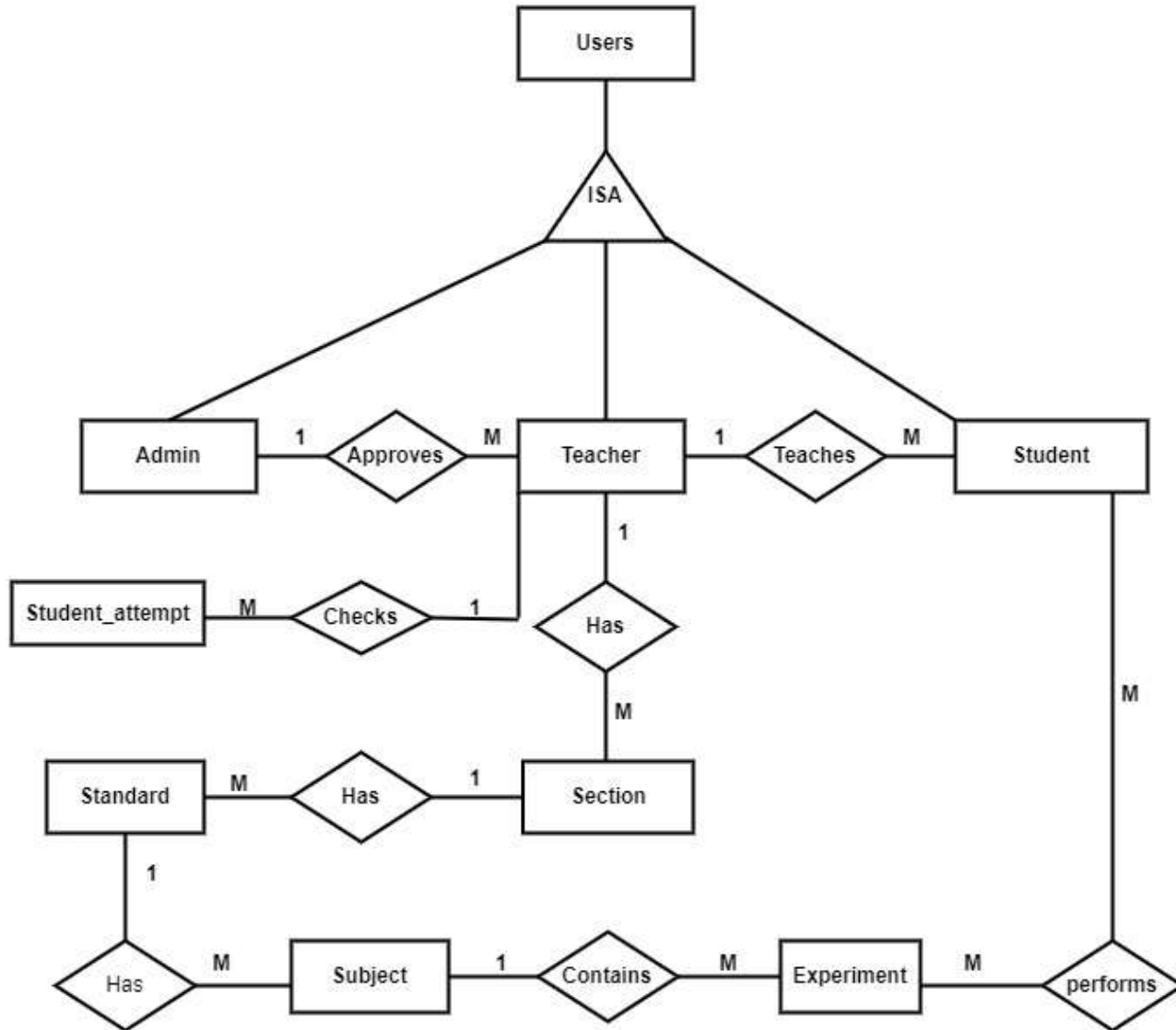


fig.- 2 TO BE System

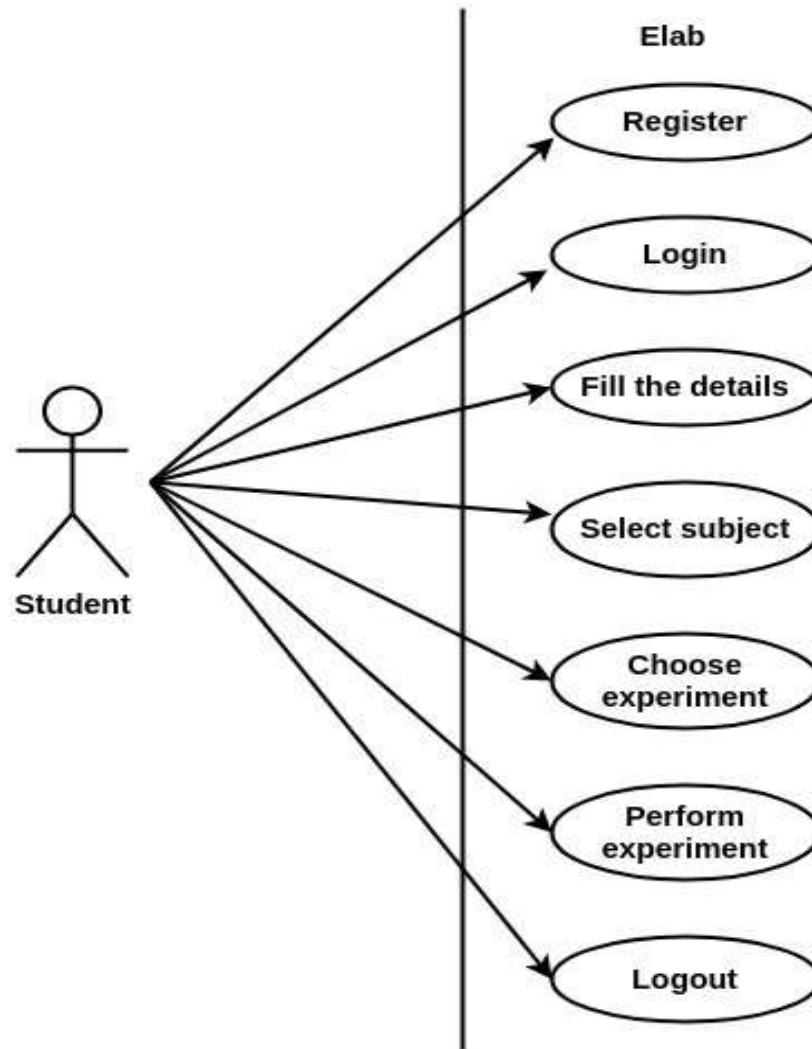
Module Hierarchy Diagram



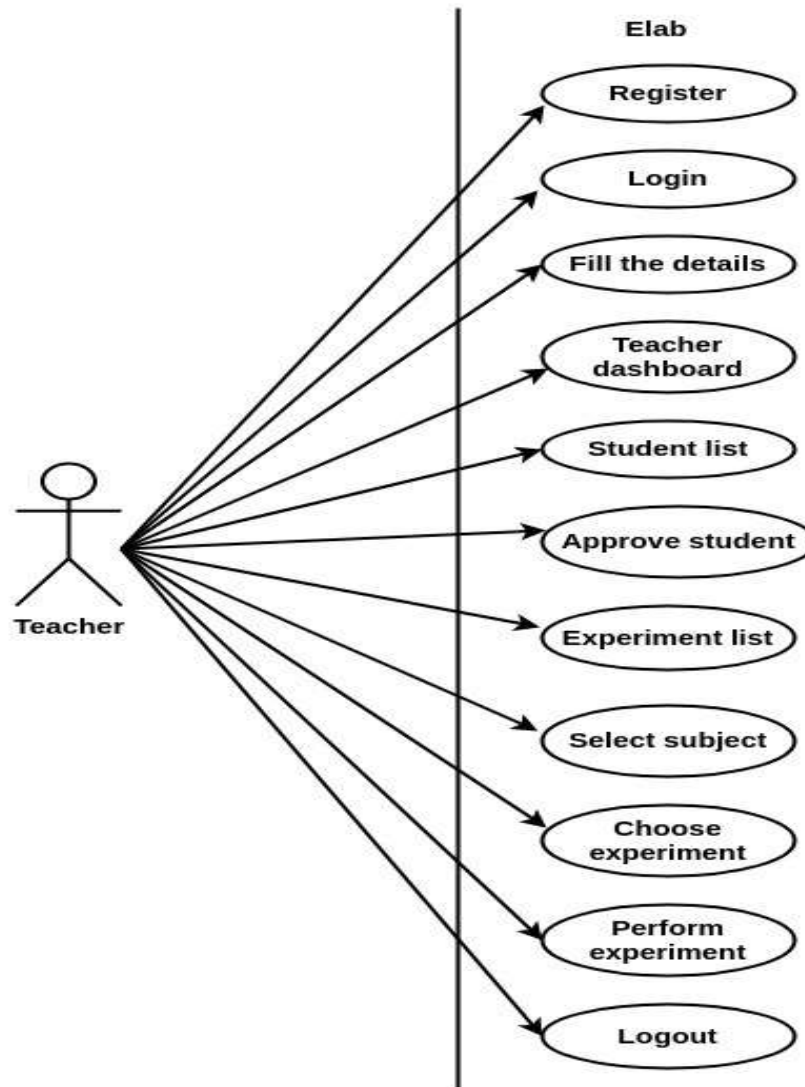
Entity Relationship diagram



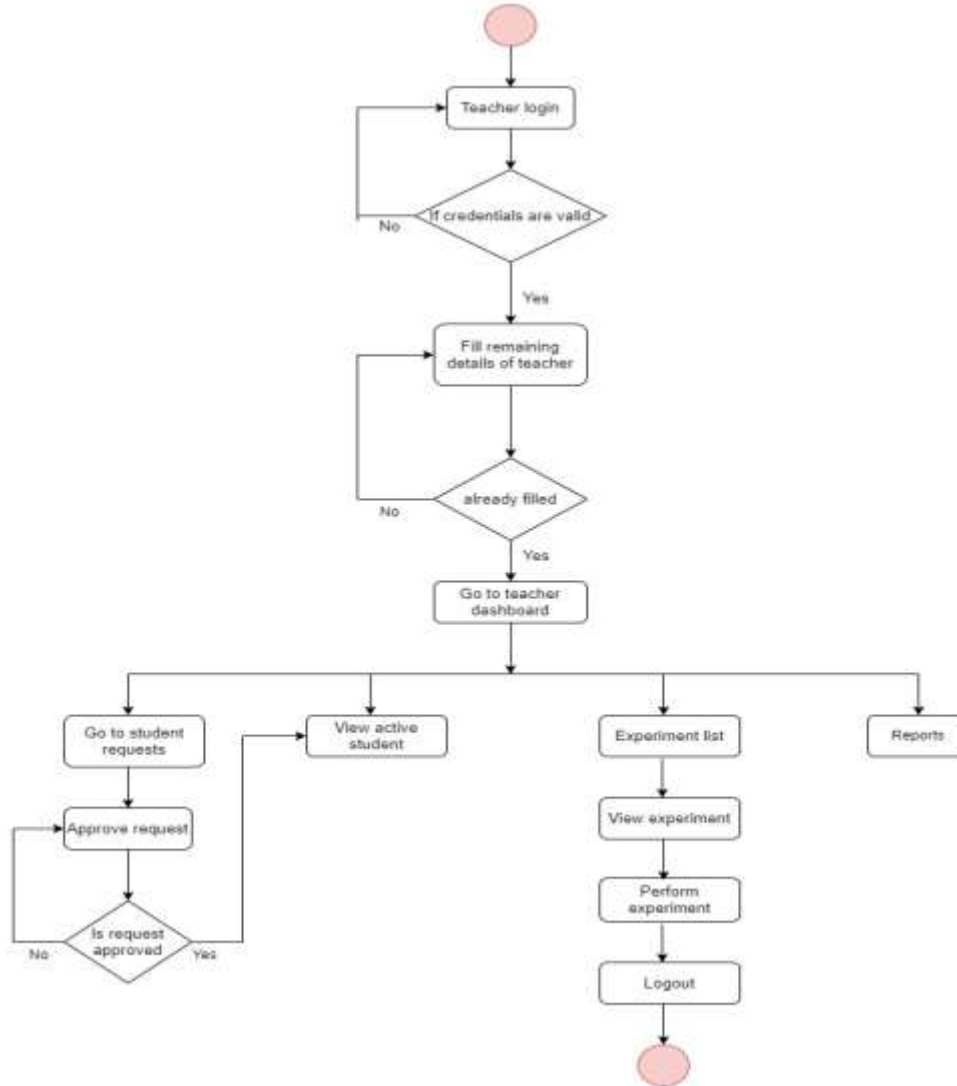
Use case Diagram of student



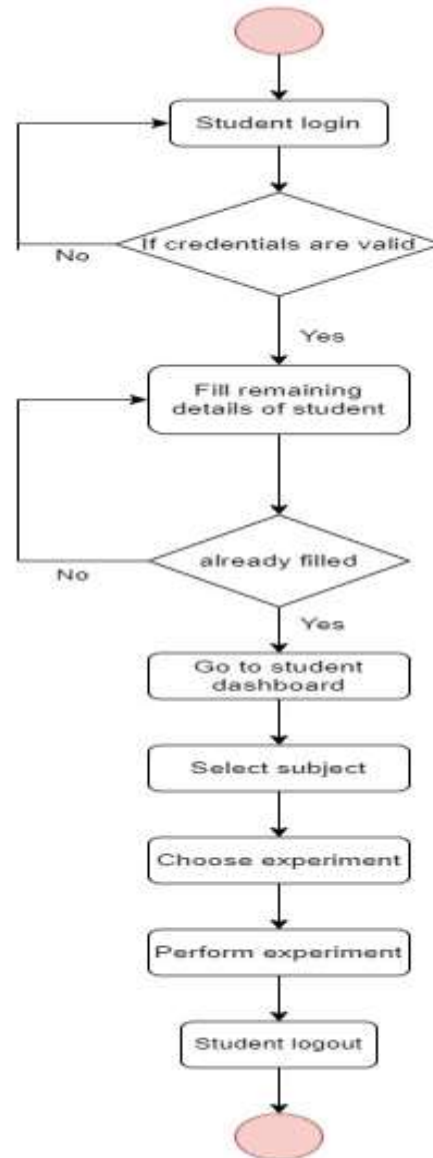
Use case Diagram of Teacher



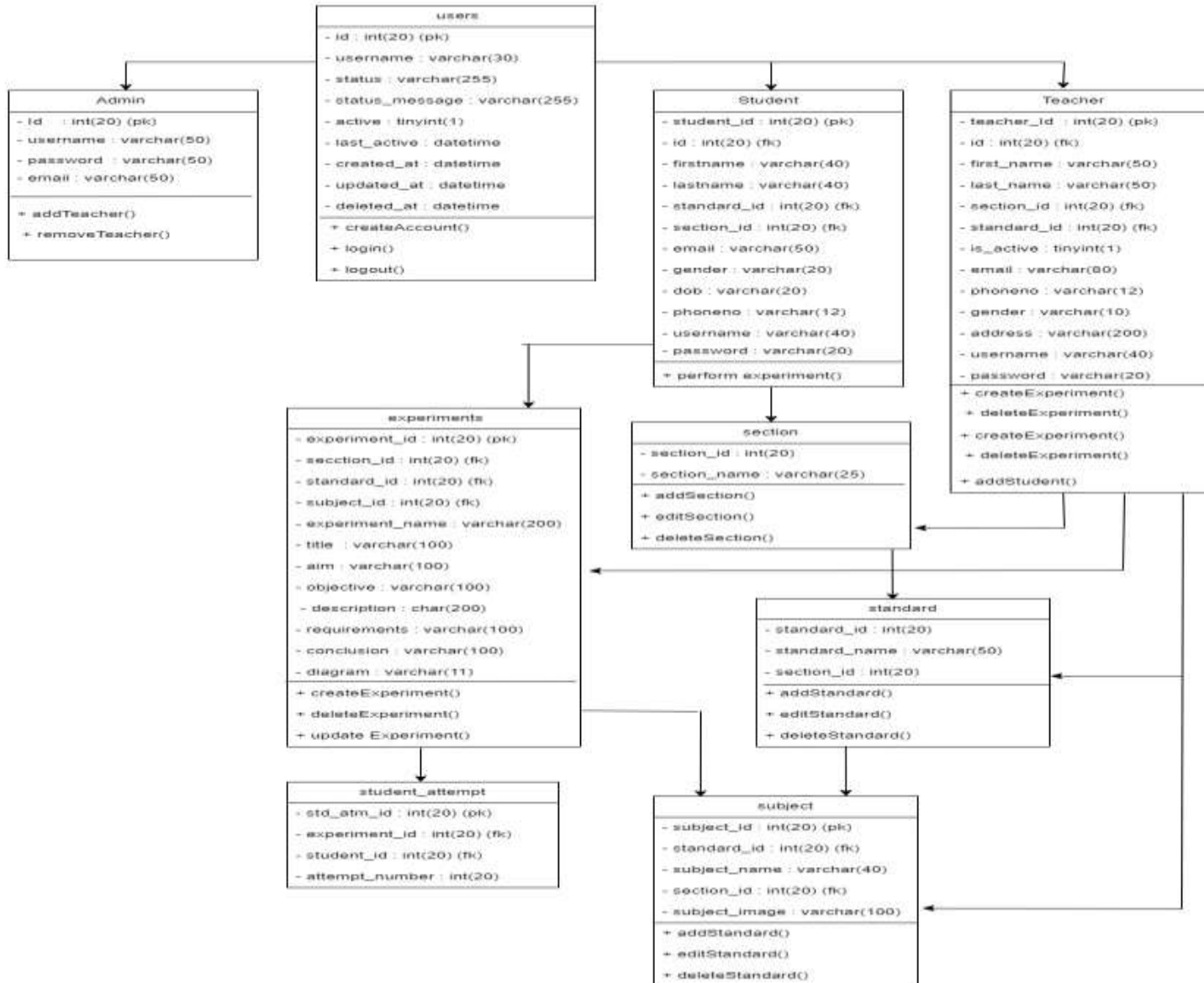
Activity Diagram for teacher:



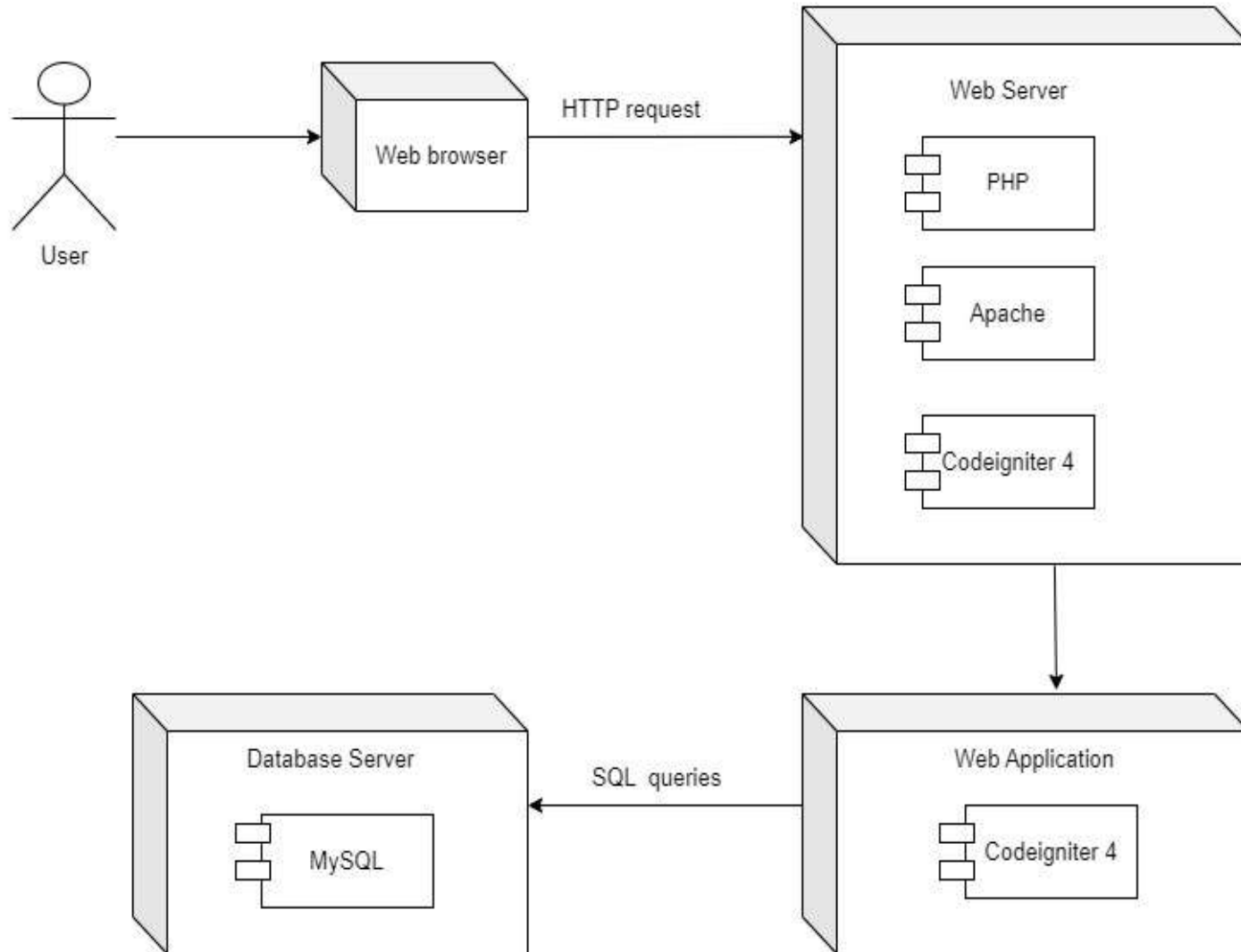
Activity Diagram for student:



Class Diagram



Deployment diagram



Data Models

- **Users:** This component would include information about the users of the system, such as their name, email, password, role (student, instructor, etc.), and any other relevant information.
- **Experiments:** This component would include information about the experiments being conducted, such as the name, description, equipment required, duration, and any other relevant information.
- **Equipment:** This component would include information about the equipment being used in the experiments, such as the name, description, specifications, and any other relevant information.
- **Data:** This component would include information about the data being collected during the experiments, such as the type of data, the format in which it is collected, and any other relevant information.
- **Results:** This component would include information about the results obtained from the experiments, such as the data collected, any calculations or analyses performed, and any other relevant information.
- **Reports:** This component would include information about the reports generated from the experiments, such as the format in which they are generated, the data and results included, and any other relevant information.

Screen Layouts

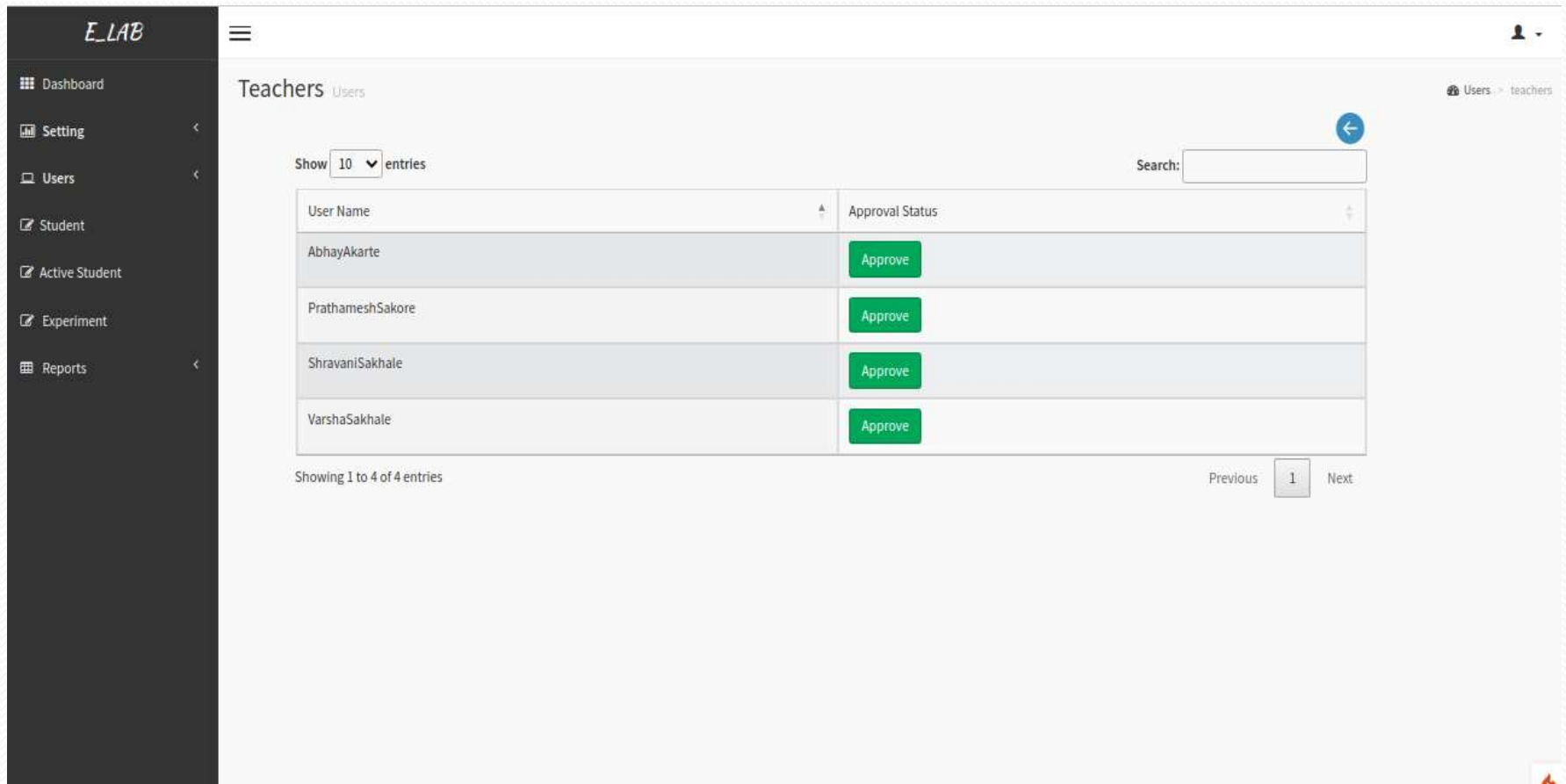
Admin Dashboard :

This is a admin dashboard where admin can handle teacher and student details and has right to approve the request of teacher.



Admin approves teacher's request :

Here admin can see the list of those teachers who have already registered but cannot login until the admin has approved the request.



The screenshot displays the E_LAB admin dashboard. On the left is a dark sidebar with navigation options: Dashboard, Setting, Users, Student, Active Student, Experiment, and Reports. The main content area is titled 'Teachers' and shows a list of four teachers, each with a green 'Approve' button. The list includes AbhayAkarte, PrathameshSakore, ShravaniSakhale, and VarshaSakhale. At the top of the list, there is a 'Show 10 entries' dropdown and a search box. At the bottom, it indicates 'Showing 1 to 4 of 4 entries' and has 'Previous', '1', and 'Next' pagination controls.

User Name	Approval Status
AbhayAkarte	Approve
PrathameshSakore	Approve
ShravaniSakhale	Approve
VarshaSakhale	Approve

Section :

E_LAB

- Dashboard
- Setting
- Users
- Student
- Active Student
- Experiment
- Reports

Section Setting

Settings > section

←

Add Section

Show 10 entries Search:

Section	Action
Junior College	Edit Delete
secondary	Edit Delete

Showing 1 to 2 of 2 entries

Previous **1** Next

Standard

E_LAB

- Dashboard
- Setting
- Users
- Student
- Active Student
- Experiment
- Reports

Add Standard

Show 10 entries

Search:


Standard	Section	Action
8	secondary	Edit Delete
9	secondary	Edit Delete
10	secondary	Edit Delete
11	Junior College	Edit Delete
12	Junior College	Edit Delete

Showing 1 to 5 of 5 entries


Previous **1** Next




Subjects

E.LAB 


Dashboard


Setting 


- Section
- Standard
- Subject


Users 


- Teacher
- Active Teacher



Student 















Active Student 


Experiment 

Reports 

Subject  Setting

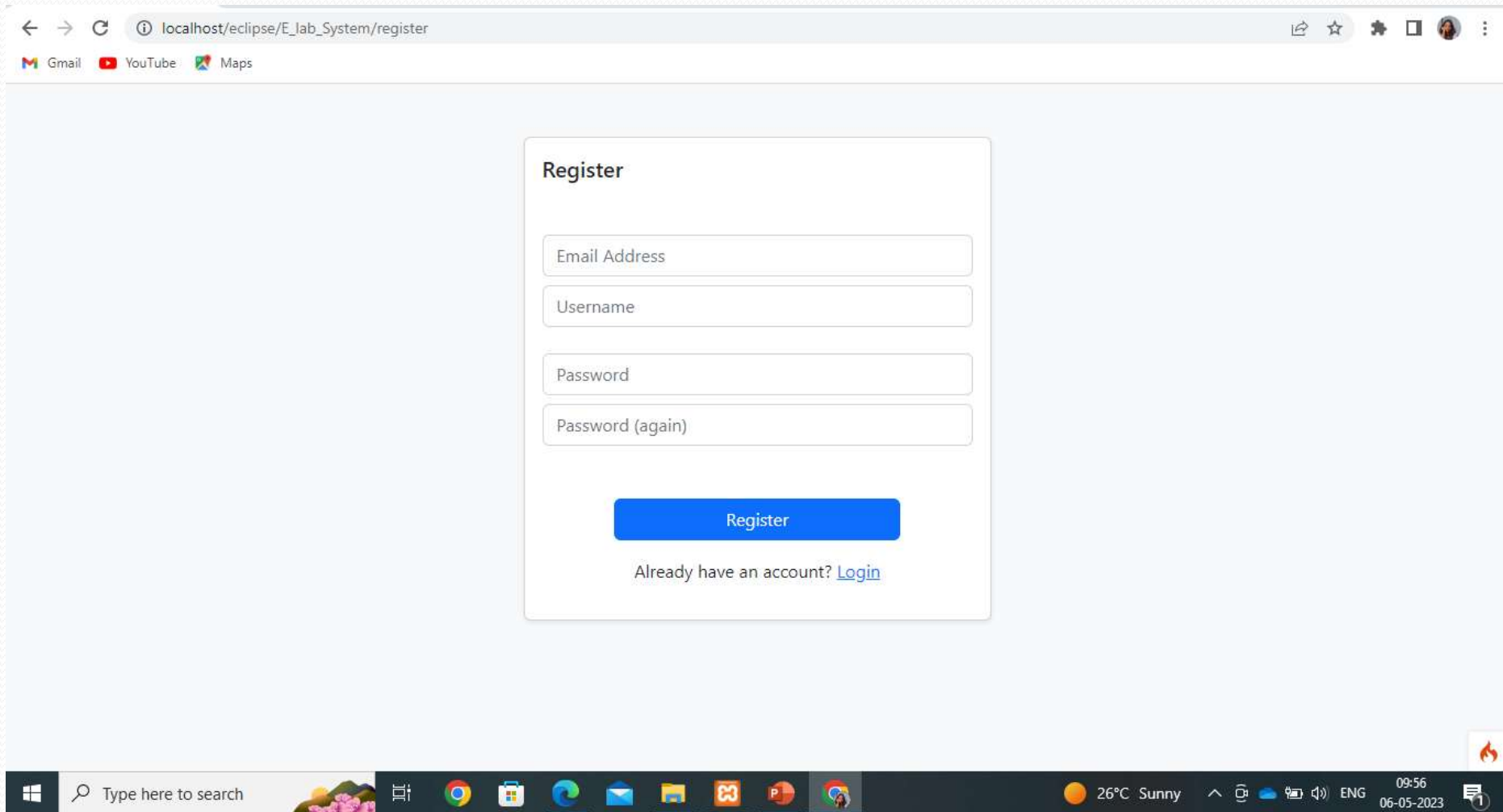
 Settings > subject 

Subject	Section	Standard	Image	Action
Science	Secondary	Eighth	science.jpg	 
Chemistry	Secondary	Fifth	chemistry.jpg	 
Physics	Secondary	Fifth	physics.jpeg	 
Biology	Middle	Tenth	biology.jpg	 
Maths	Secondary	Fifth	maths.jpg	 
Science	Middle	Tenth	science.jpg	 
Chemistry	Middle	Tenth	chemistry.jpg	 



Registration form :

This is a registration form where teacher and student can register.



The image shows a web browser window displaying a registration form. The browser's address bar shows the URL `localhost/eclipse/E_lab_System/register`. The form is titled "Register" and contains four input fields: "Email Address", "Username", "Password", and "Password (again)". Below the fields is a blue "Register" button. At the bottom of the form, there is a link that says "Already have an account? [Login](#)". The browser's taskbar at the bottom shows the Windows logo, a search bar, and several application icons. The system tray on the right shows the date and time as 09:56 on 06-05-2023, along with weather information (26°C Sunny) and system icons.

localhost/eclipse/E_lab_System/register

Gmail YouTube Maps

Register

Email Address

Username

Password

Password (again)

Register

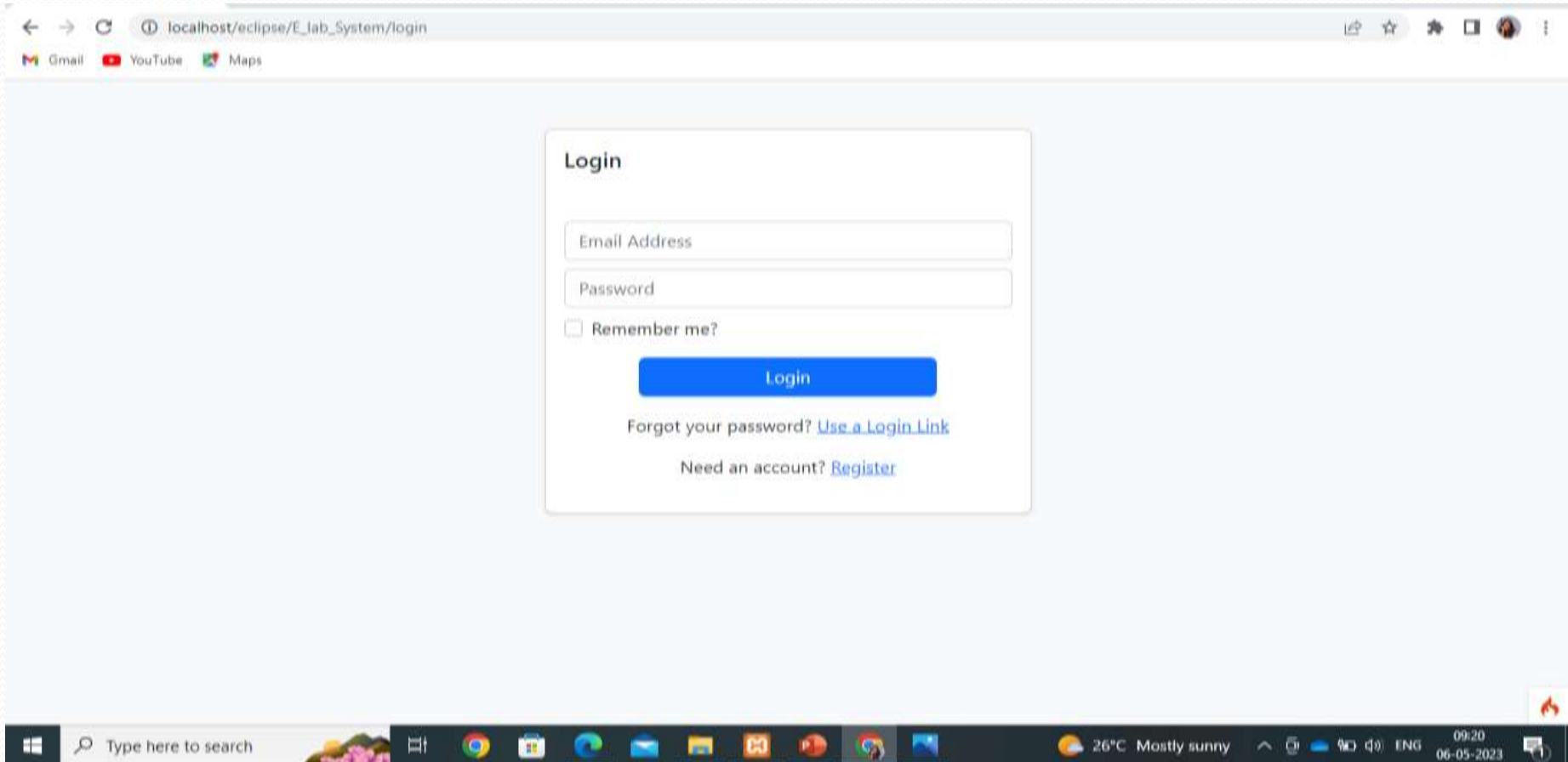
Already have an account? [Login](#)

Type here to search

26°C Sunny 09:56 06-05-2023

Login Page :

After registration teacher and student can login.



Details to be filled after teacher's login :

Register

First Name

Last Name

Email Address

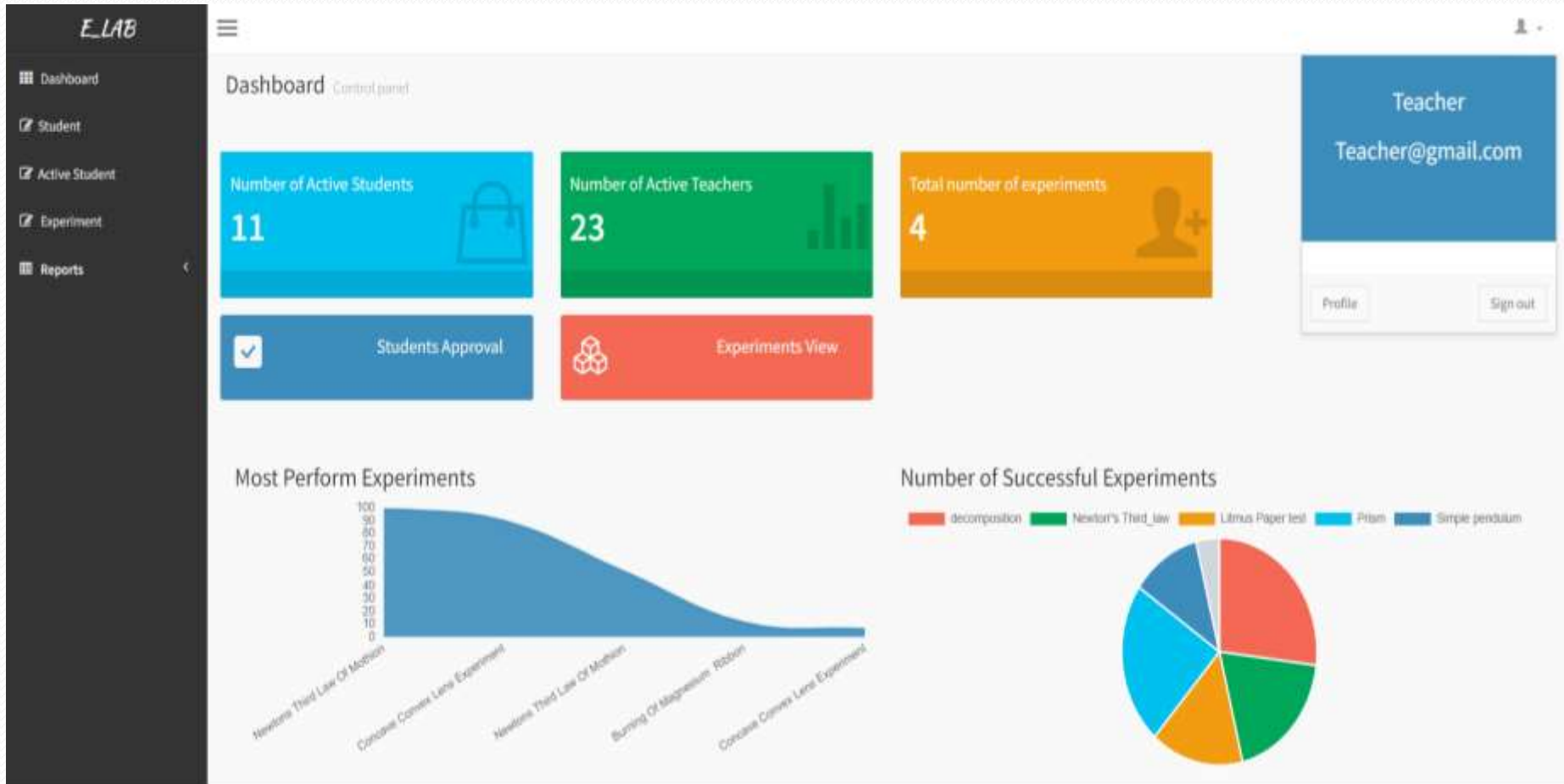
Phone no

Gender Male Female



Address









Teacher Dashboard :




Teacher approves student request :

E_LAB  

Dashboard  **Setting**  **Users**  **Student**  **Active Student**  **Experiment**  **Reports**


Student

 Student >

Show entries

User Name	Action
AmritaSingh	<input type="button" value="Approve"/>
BharatRajankar	<input type="button" value="Approve"/>
JuiTayade	<input type="button" value="Approve"/>
ManjeetSingh	<input type="button" value="Approve"/>
NayanIngole	<input type="button" value="Approve"/>

Showing 1 to 5 of 5 entries



Active Students

Dashboard

Setting

Users

Student

Active Student

Experiment

Reports

Active Student


Show 10 entries

Search:


Use Name	Action
Ajay	Disapprove
Amit	Disapprove
Atharva	Disapprove
Ayush	Disapprove
deepika	Disapprove
jane	Disapprove
Jane001	Disapprove
Piyush	Disapprove
piyush001	Disapprove
Student	Disapprove

Showing 1 to 10 of 12 entries

Previous 1 2 Next





Experiment :

E_LAB 
















- Dashboard
- Setting
- Users
- Student
- Active Student
- Experiment
- Reports


Experiments

experiments 



Show entries Search:

Experiment	Section	Subject	Standard	Title	Aim	objective	Action	Try
Burning Of Magnesium Ribbon	Middle	Chemistry	Eighth	Burning Of Magnesium Ribbon	The heat of formation of magnesium oxide is -601.83 kJ/mol.	A quick demonstration which illustrates the concept of an exothermic reaction, as well as one that p	 	
Concave Convex Lens Experiment	Secondary	Science	Fifth	Concave Convex lens	Diverges the incident rays away from the principal axis.	Concave lenses are commonly used in eyeglasses for people with nearsightedness and in projectors to	 	
Filtration of Water	Secondary	Chemistry	Tenth	Filtration of water	To determine the parameters that are characteristic for a filtration process.	To produce safe and clean water	 	
Image Formation	Secondary	Science	Tenth	Image Formation	For convex mirror, image is should always formed behind the mirror, virtual, erect and diminished.	Convex mirrors are used in the rearview mirrors of all the vehicles. They give a larger view when c	 	
Litmus Paper Test	Secondary	Chemistry	Tenth	The litmus test	To tell whether a solution is acidic or basic	Litmus paper or red and blue test strips can tell you whether a	 	



Details to be filled after student's login :

Register

First Name

Last Name

Standard

Section

dd/mm/yyyy

Phone Number

Gender Male Female

Address




Student Dashboard :

ELAB




Select subject

ELAB



Physics

An illustration representing physics, featuring a glowing lightbulb, a pendulum, a stack of books with 'PHYSICS' written on them, and a blue book with a red ribbon.



Chemistry

An illustration representing chemistry, showing a laboratory setup with a Bunsen burner, test tubes, a flask, and a stack of books with 'CHEMISTRY' written on them.



Biology

An illustration representing biology, featuring a collage of biological concepts such as DNA, a microscope, a cell, and various organisms, with the word 'Biology' prominently displayed.



Select Experiment:

ELAB



Newton's Third Law Of Motion

Newton's Third Law

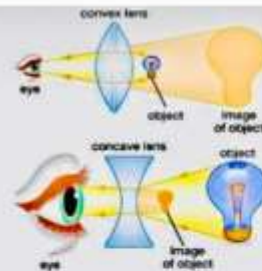
[Experiment Details](#)



Burning Of Magnesium Ribbon

Burning Of Magnesium Ribbon

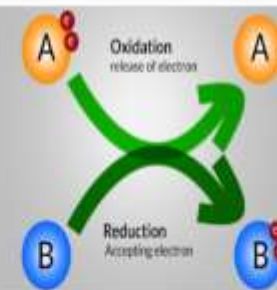
[Experiment Details](#)



Concave Convex Lens Experiment

Concave Convex lens

[Experiment Details](#)



Oxidation and Reduction

Oxidation and Reduction

[Experiment Details](#)

Perform Experiment :

[ELAB](#) [Title](#) [Aim](#) [Objective](#) [Description](#) [Requirements](#) [Conclusion](#) [Diagram](#) [Simulation](#)

[Back](#)

Title

Concave Convex lens

Aim

Diverges the incident rays away from the principal axis.

Objective

Concave lenses are commonly used in eyeglasses for people with nearsightedness and in projectors to

Description

A concave lens is thinner in the middle and thicker at the edges. A convex lens is thicker in the middle and thinner at the edges. Used in the camera, overhead projector, projector microscope, simple telescope, magnifying glasses, etc. It is also used for the correction of the problem in long sight.

Requirements

concave, convex lens, touch

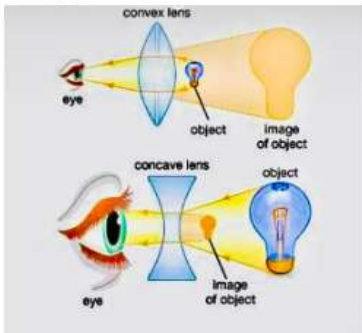
Requirements

concave, convex lens, tounch

Conclusion

In the convex lens, the curve is outward facing, whereas, in the concave lens, the curve faces inwar

Diagram



Simulation

Start Simulation

Simulation :

Concave Convex lens

The simulation interface features a dark sidebar on the left with a 'Reset' button, a 'Help' button, and a gold award ribbon icon. The main area displays two ray diagrams. The top diagram shows a flashlight emitting parallel red rays that pass through a convex lens and converge at a focal point. The bottom diagram shows a flashlight emitting parallel red rays that pass through a concave lens and diverge. A 'Play' button is located in the top right corner, and a small icon is in the bottom right corner.

Limitations & future Enhancements

- Incorporating 3D elements: While a 2D system can be useful, incorporating 3D elements can provide a more immersive and realistic experience for students. This could include 3D models of equipment and environments, allowing students to explore and interact with virtual objects in a more tangible way.
- Increased interactivity: To make the laboratory experience more engaging and interactive, the system could include more opportunities for students to actively participate in experiments. This could include interactive simulations, real-time data collection and analysis, and more opportunities for students to control variables and make decisions.
- Gamification: Adding game-like elements to the laboratory system, such as points, badges, and leaderboards, can motivate students and encourage them to engage with the material in a more meaningful way.



THANK YOU!