Ramrao Adik Institute of Technology

(Department of Computer Engineering)
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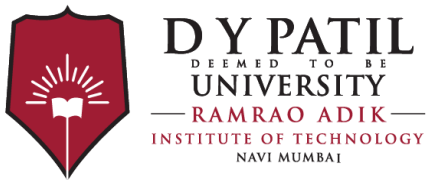

Mini Project Report
On

Virtual Labs For Machine Learning Algorithms

Subject-: Web Design Lab

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Signature of Internal Examiner **Signature of External Examiner**

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Abstract

- The world is now witnessing what can be described as the technological invasion of all fields of life. It is the result of the unprecedented advances in scientific and technological fields throughout history.
- This new age of technology has helped us use digital devices in many fields, including education, which also helped spread e-learning platforms and distance education.
- One way technology has benefited education is the emergence of virtual labs. Virtual labs are virtual environments designed for various experiments, through them the real science lab is simulated to link the practical side with the theoretical side.
- All students have the freedom to do the experiments without a supervisor and without exposure to any kind of danger. This is done through computer applications that cover all fields.
- This report describes the development of a virtual laboratory for teaching various machine learning algorithms. The software developed virtual lab system has a different type of algorithm like linear regression, decision tree and logistics regression and many more we can add. In that we have given the aim procedure, theory illustration, simulation and observation. We have also provided the google Collab books where user will download the dataset from our website and run in that books

CHAPTER NO 1
INTRODUCTION

People who are exploring machine learning as a field to shift their careers or people who are just curious of why there is such a buzz of machine learning all over places often has one burning question in their mind – what all possible things can one achieve with machine learning. Well the short answer is – the possibility is endless and one's creativity is the only limit. In this post we will motivate beginners with machine learning examples which are in popular use in today's world

In the end we will also look at few areas where machine learning is being used in the most creative and fun ways possible.

1.1. Purpose and Problem definition:

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. **Machine**

learning focuses on the development of computer programs that can access data and use it learn for themselves

The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns

in data and make better decisions in the future based on the examples that we provide. The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

In this problem we are going to make a website ie virtual labs for machine learning algorithms . There we have added code ie execution for each algorithms separately for each dataset.

In virtual labs we are going to add seperate part for exploratory analysis.

Virtual Labs are intended to augment the learning of science and engineering subjects through performing **experiments**.
The **experiments** are designed either as simulations or as remote triggered.

1.3 Scope:

The use cases machine learning can play a role in are seemingly unlimited but what's the future of this fascinating field? Where is it going? Machine learning is currently one of the hottest topic in IT. The reason stems from the seemingly unlimited use cases in which machine learning can play a role, from fraud detection to self-driving cars to identifying your "gold card" customers to price prediction.

CHAPTER NO 2

Analysis

2.1 Issues in current system:

- In this projects the issues found in deployment . During start we were looking for the text editor to add in the project. It was not supporting due to programming language issues. Hence we were not able to deploy a text editor for students practice.

- We have made a quiet straight forward approach towards the design. We have made quiet attractive and have made it simple to understand. We can increase the look of website in future.

2.2 Benefits of proposed system:

1- Virtual labs enable students to perform many experiments that are difficult to perform in real laboratories because of the risks.

2- Virtual labs help teachers and students save time and effort because they don't need to adhere to certain times to enter the lab, or to move from one place to another.

3- Virtual labs enable students and teachers to use the latest technologies. **4-** Virtual Labs help users keep up with the technological development of the digital age.

5- Virtual labs allow students to perform the practical experiments related to the theoretical courses, which helps them absorb the courses.

6- The virtual lab provides enjoyment during experiments.

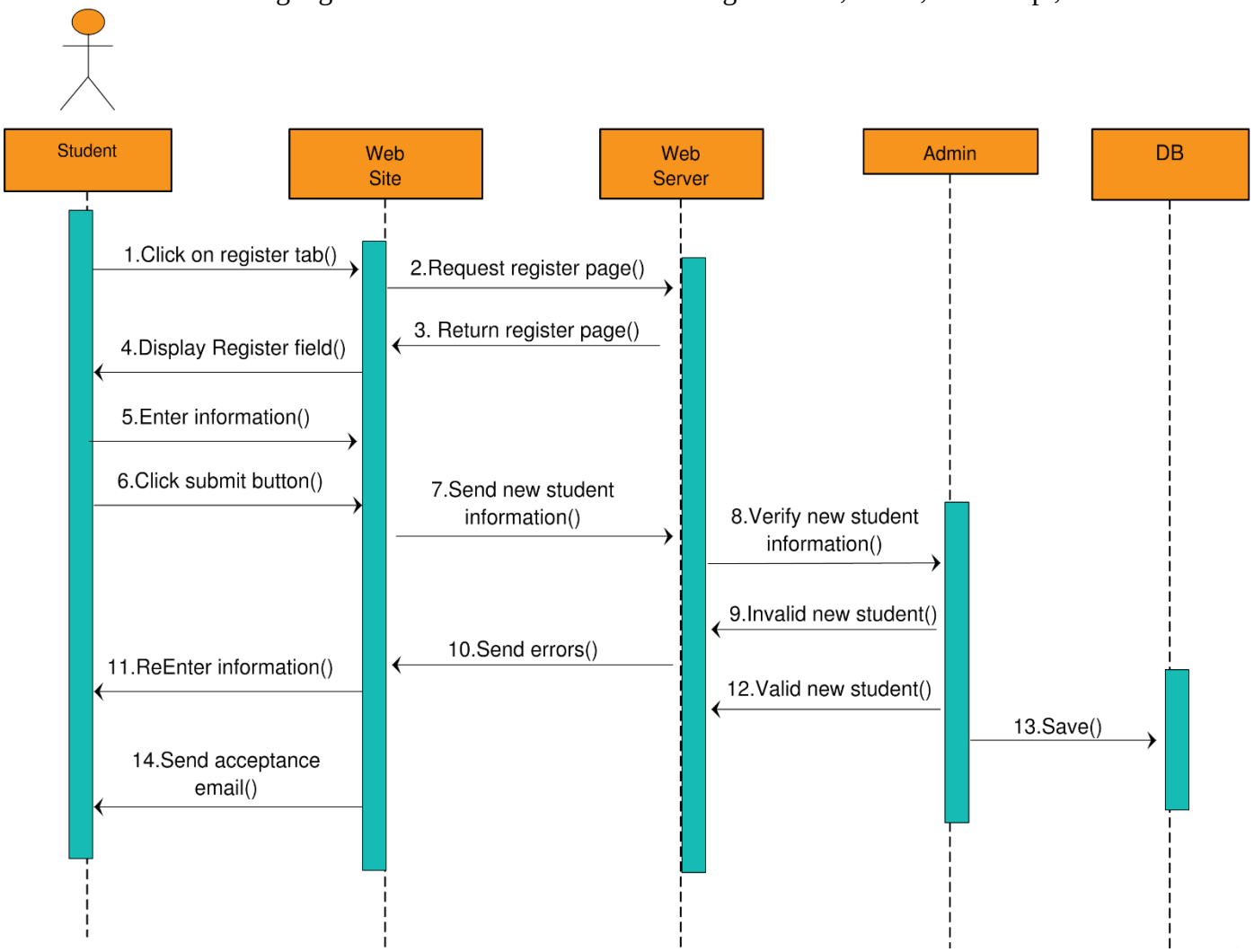
7- Virtual labs provide flexibility in performing experiments.

CHAPTER NO 3

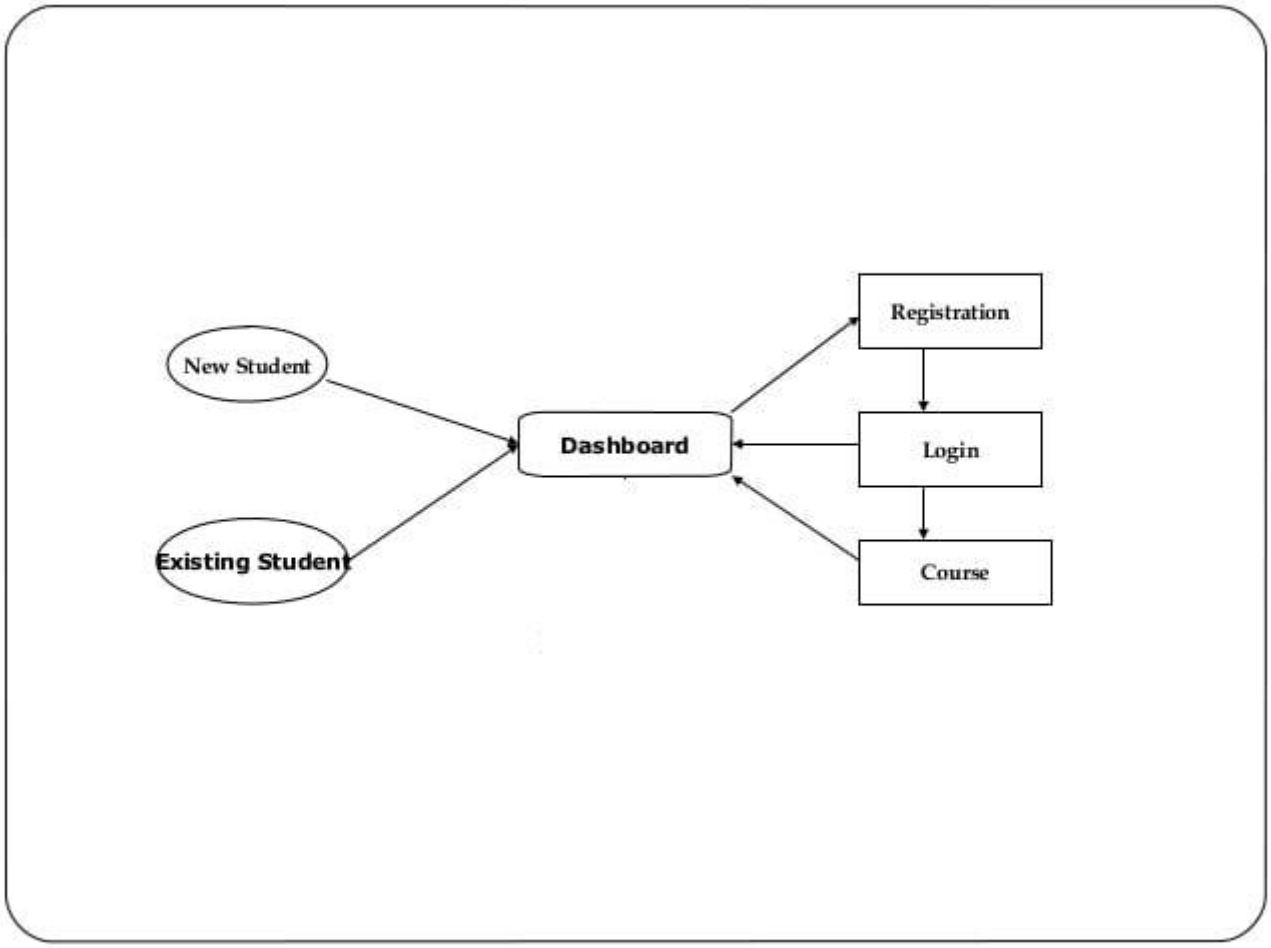
Design

3.1 System Architecture

In the below given architecture diagram, the student has to login to access virtual labs. Once the student has login the information is saved into our database as well as in the admin login. The admin has rights to create student profile and also can manage the courses. In the student section, the student will be able to access the labs for machine learning algorithms. The website is build using HTML5, CSS3, JavaScript, etc.



Data flow Diagram:



Chapter 4
Implementation

4.1 Hardware and software requirements:

Software Requirements:

1. Jupyter notebook/Google colab for performing algorithms
2. Html , CSS and Javascript for website.

4.2 Referring the architecture diagram, there are various modules in our project such as:

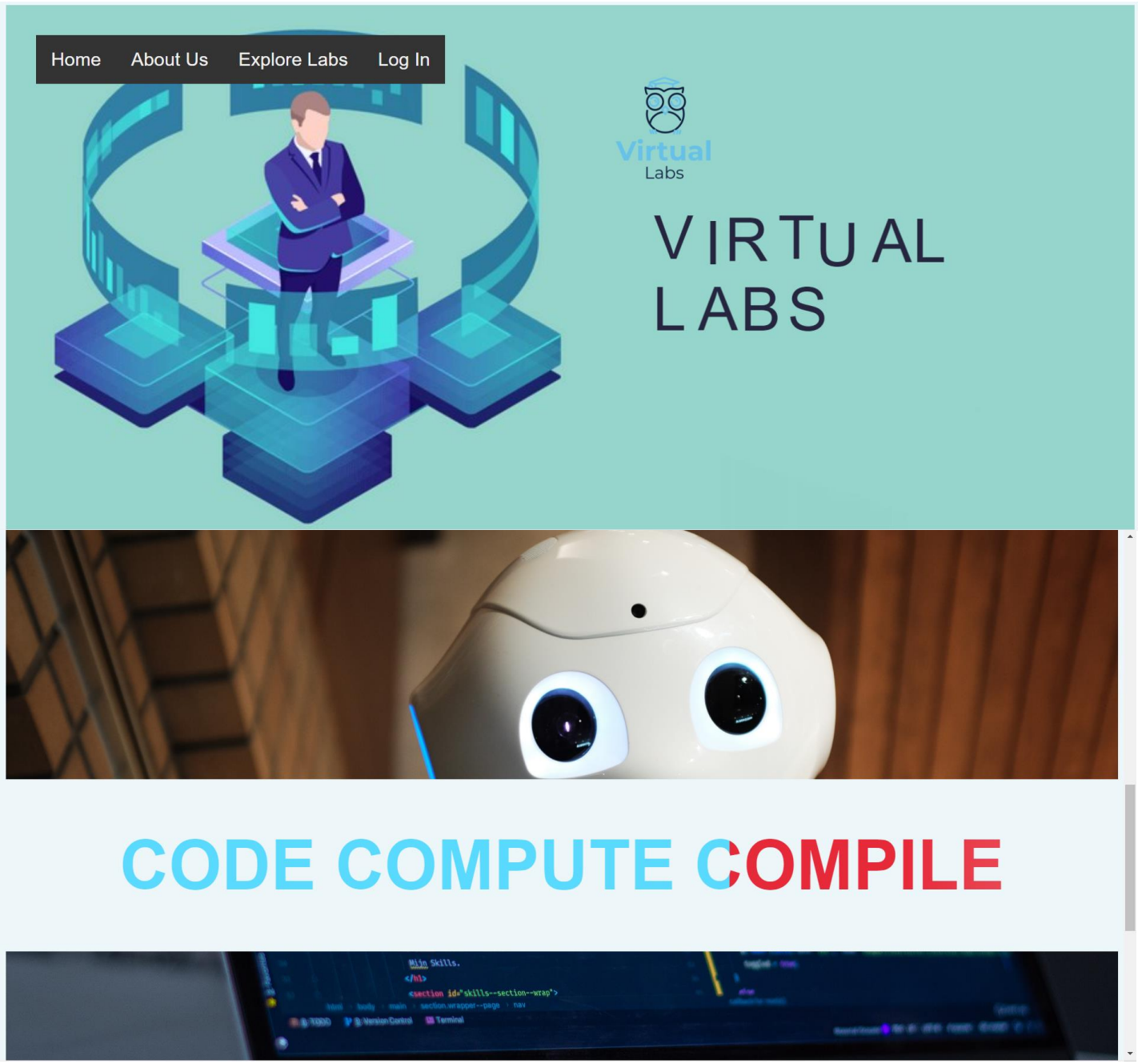
1. User Login: the user has to login or he can register himself/ herself.
2. Student Page: The student page has various features like:
   - Courses: The student can access the courses from their and enroll for the courses.
   - Labs: In this the student can see the machine learning labs and learn them. In this we used google colab were the user can run the code using data sample provided.
   - Enroll- History: The user can check their enroll history in how many courses they have enrolled and can modify it also.
   - Change-Password: Simply to change the password.
3. Admin Page: The admin has various rights to edit, modify a course, session, etc.
   - Session: The admin can create a new session or modify an existing session.
   - Department: the admin can add or delete a department.
   - Register: The admin can register a new student or edit the details of an existing student.
   - Enroll-History: In this section he will be able to see how many students have taken which particular course with all the student details.

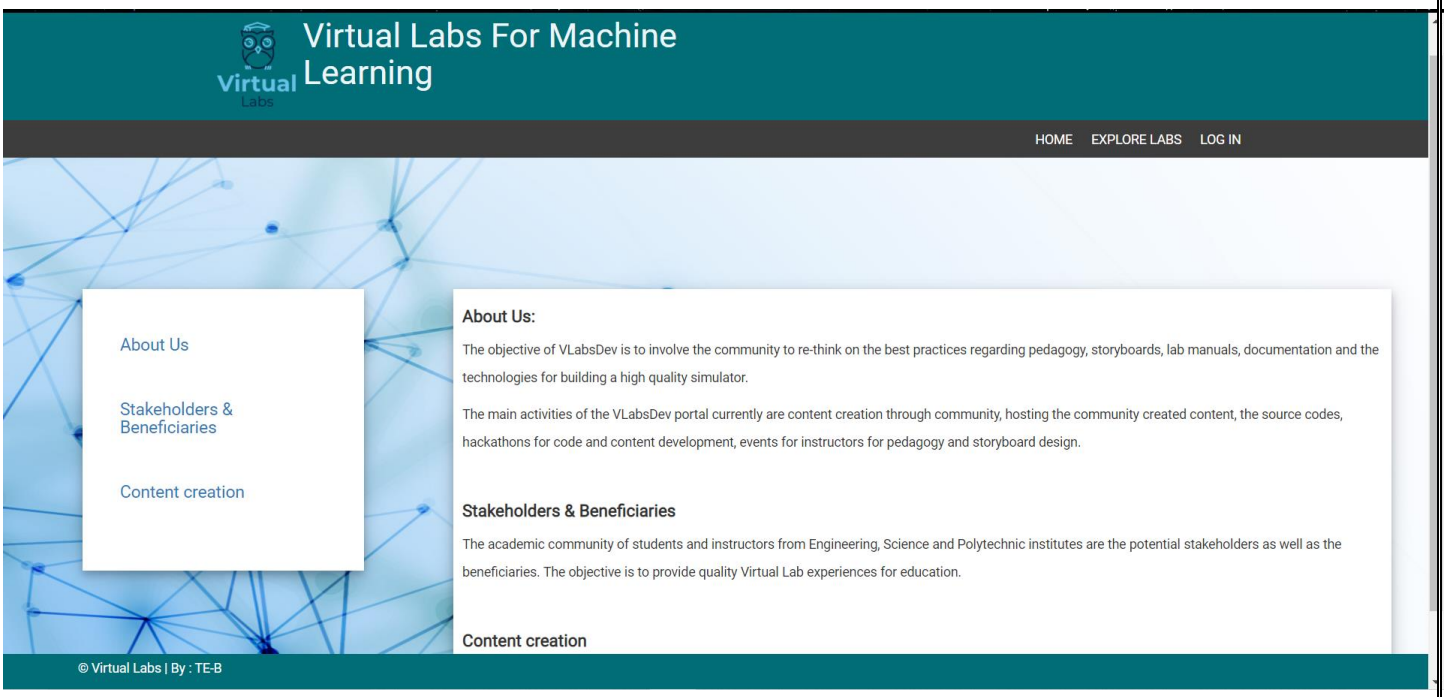
CHAPTER NO 5

Evaluation

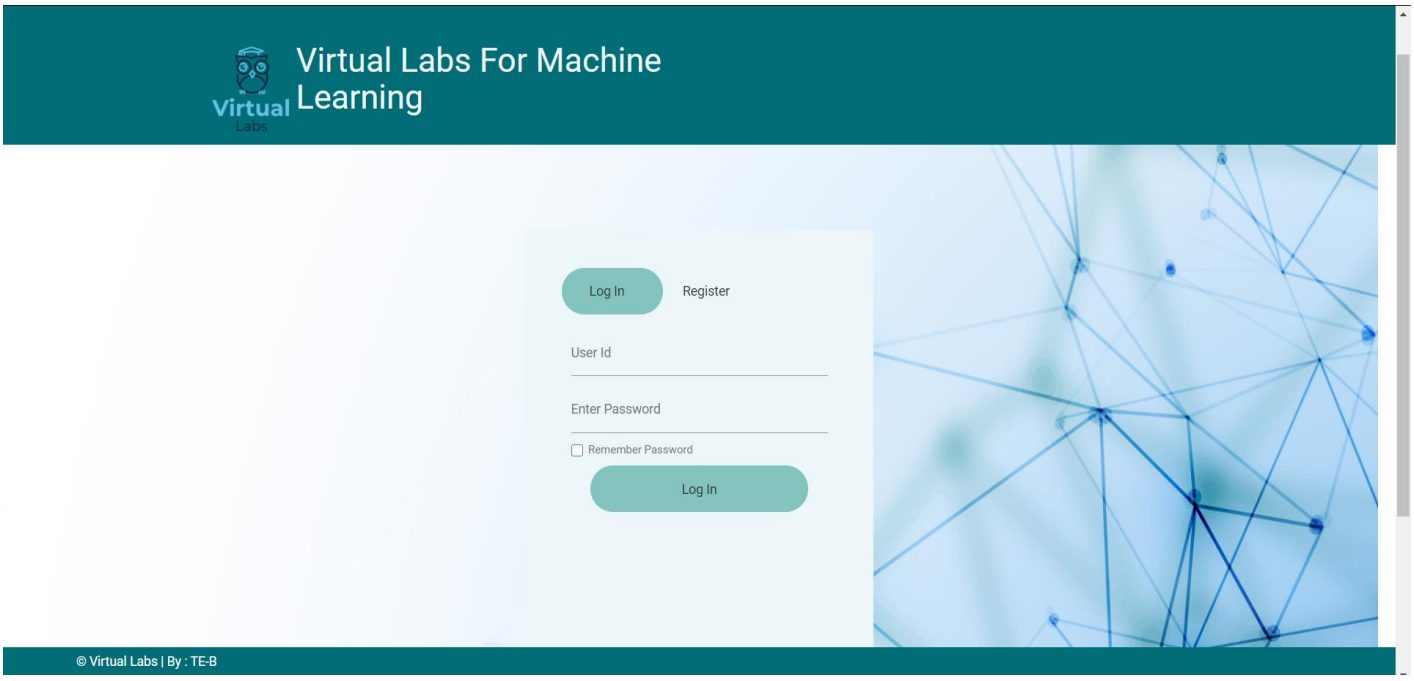
- Graphical User Interface :

The Home Page:

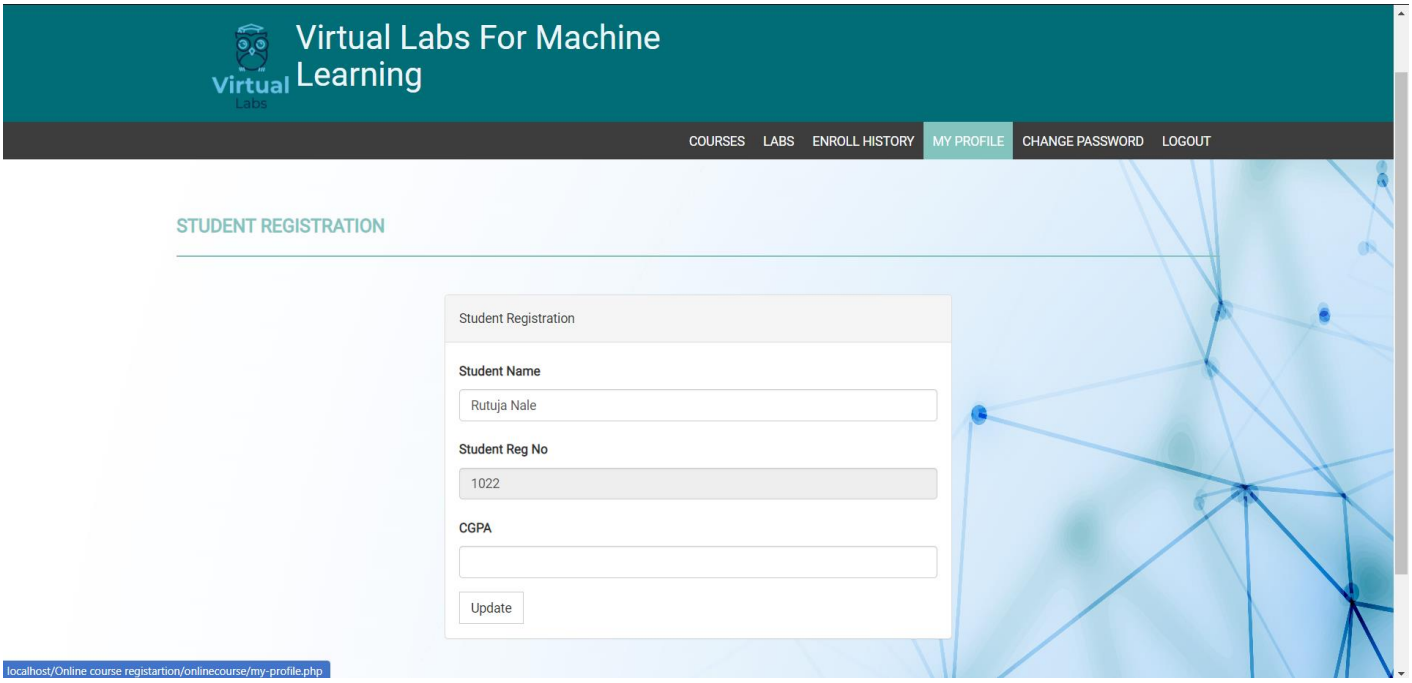




Log in page: Here student can register as well as log in using the appropriate details.

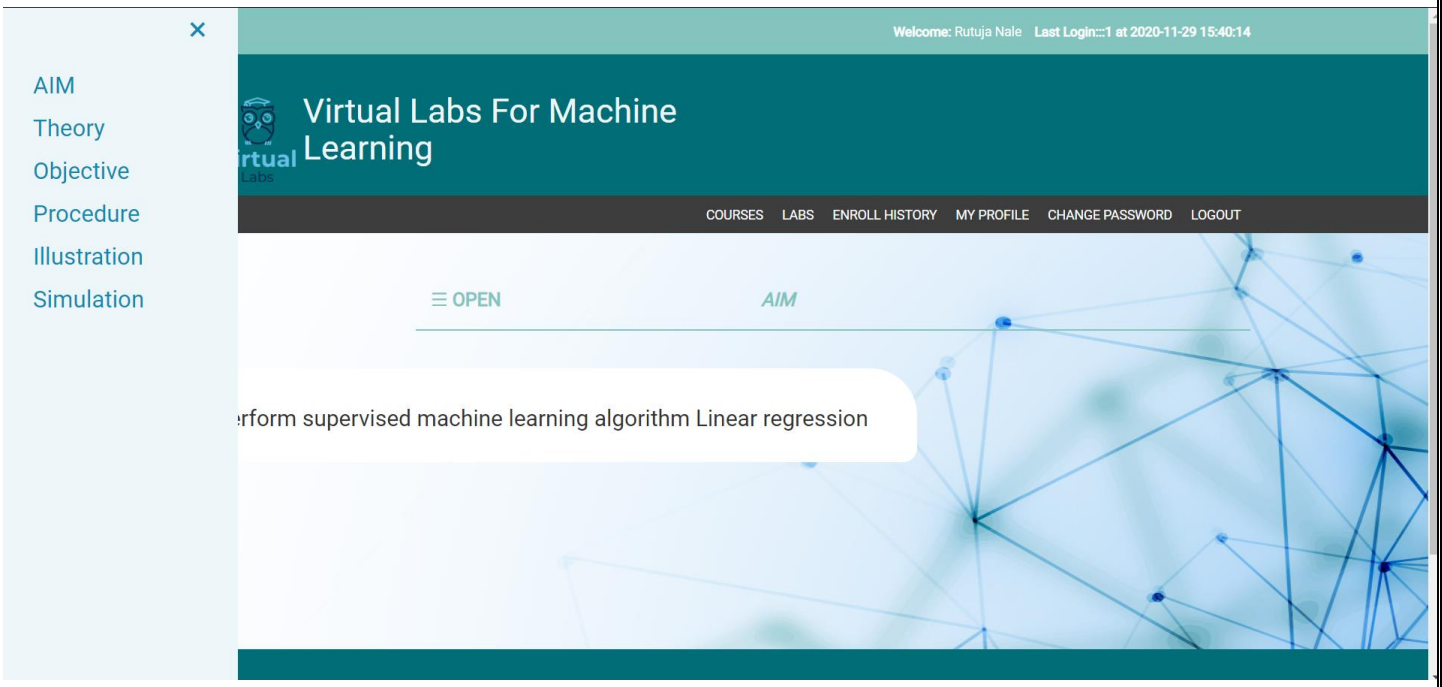


The student profile window:



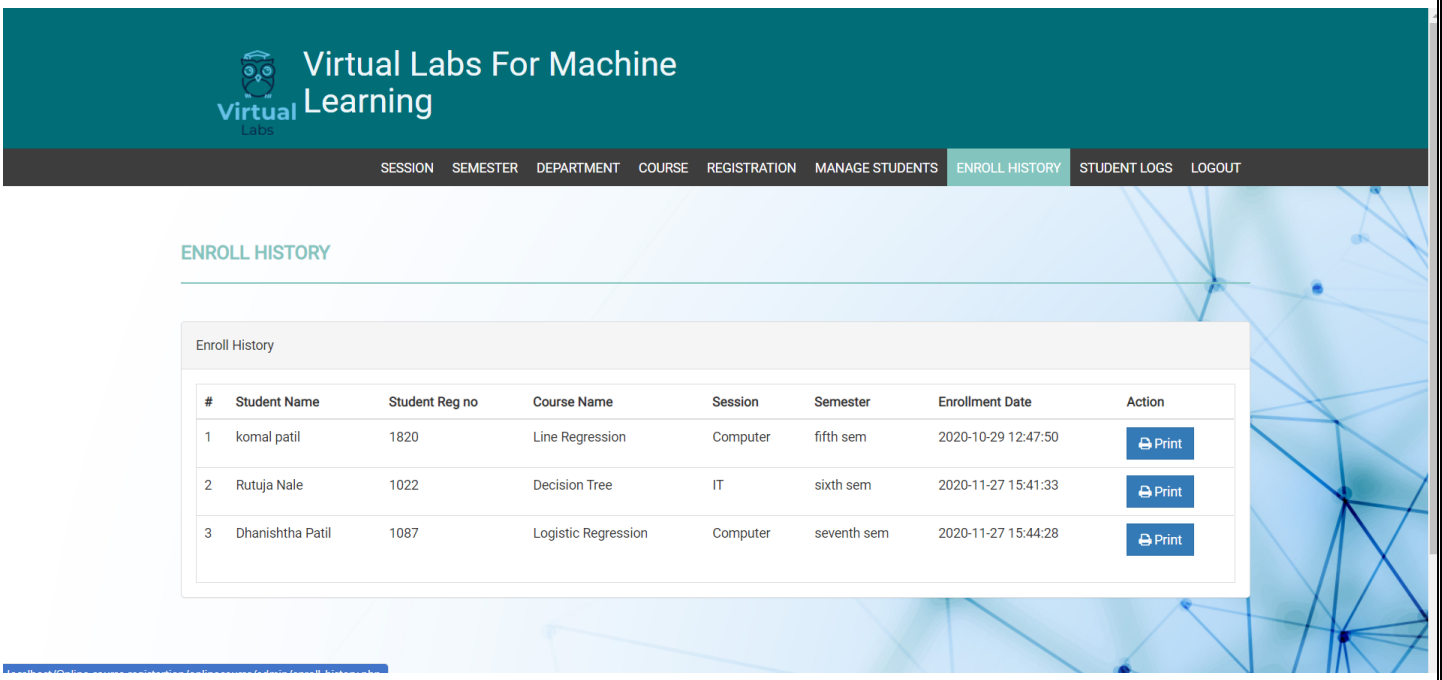
The labs Page: In this, there are three machine learning algorithms available

In this ever lab manual have aim, theory, etc which are useful for the user so as to understand the particular lab and its functioning.
In the aim section, the user can see the aim for the experiment.
In the theory section, the experiment is briefly explained so that the user will understand.
In the procedure section, different steps are provided for the user to follow so as to complete the experiment.
In the illustration section the user can see the formulas of the algorithms and the particular requirements.



In the simulation section, shown below the user can perform the experiment

The admin page:


Virtual Labs For Machine Learning
SESSION
SEMESTER
DEPARTMENT
COURSE
REGISTRATION
MANAGE STUDENTS
ENROLL HISTORY
STUDENT LOGS
LOGOUT
ENROLL HISTORY
Enroll History
Student Name Student Reg no Course Name Session Semester Enrollment Date Action
1 komal patil 1820 Line Regression Computer fifth sem 2020-10-29 12:47:50 Print
2 Rutuja Nale 1022 Decision Tree IT sixth sem 2020-11-27 15:41:33 Print
3 Dhanishtha Patil 1087 Logistic Regression Computer seventh sem 2020-11-27 15:44:28 Print

CHAPTER NO 6

CONCLUSION

- As the world undergoes a radical transformation in techniques and methods of education and the use of digital devices in education, it is essential that educational institutions keep up with that transformation in order to help their students compete in the labor market and fields of research.
- It is clear to us that the digital age will only open the way for those who can keep up with it and have technological skills that enable them to adapt to the technological applications in all aspects of life.

Vlabs For Machine Learning Algorithms

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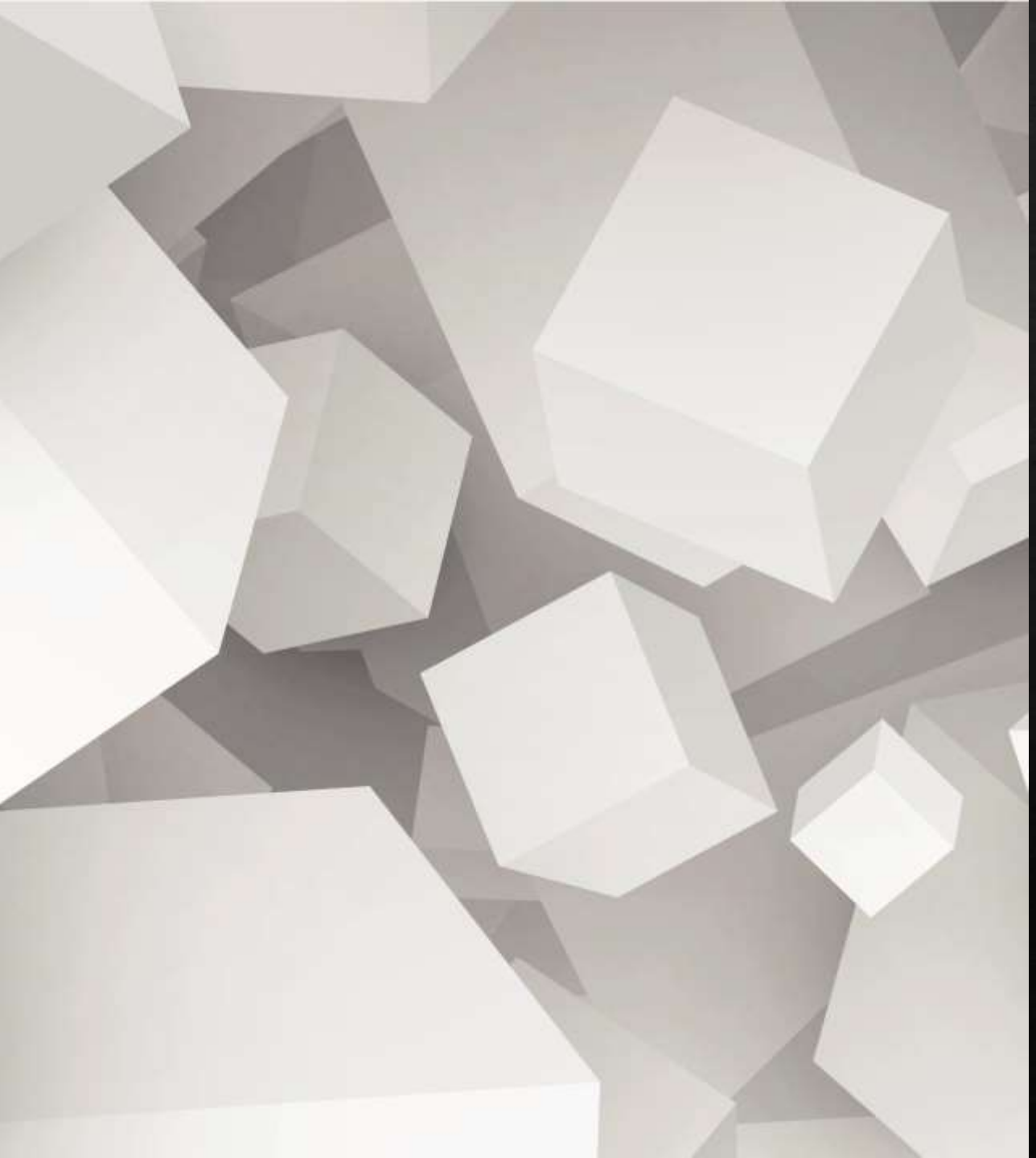
AIM

- In this problem we are going to make a website i.e virtual labs for machine learning algorithms . There we have added code i.e execution for each algorithms separately for each dataset. Virtual Labs are intended to augment the learning of science and engineering subjects through performing experiments. The experiments are designed either as simulations or as remote triggered.

Hardware and Software Requirements

- Jupyter notebook/Google Colab for performing algorithm
- Html ,CSS JavaScript for website.
- JavaScript for website
- MYSQL
- PHP



Website Design

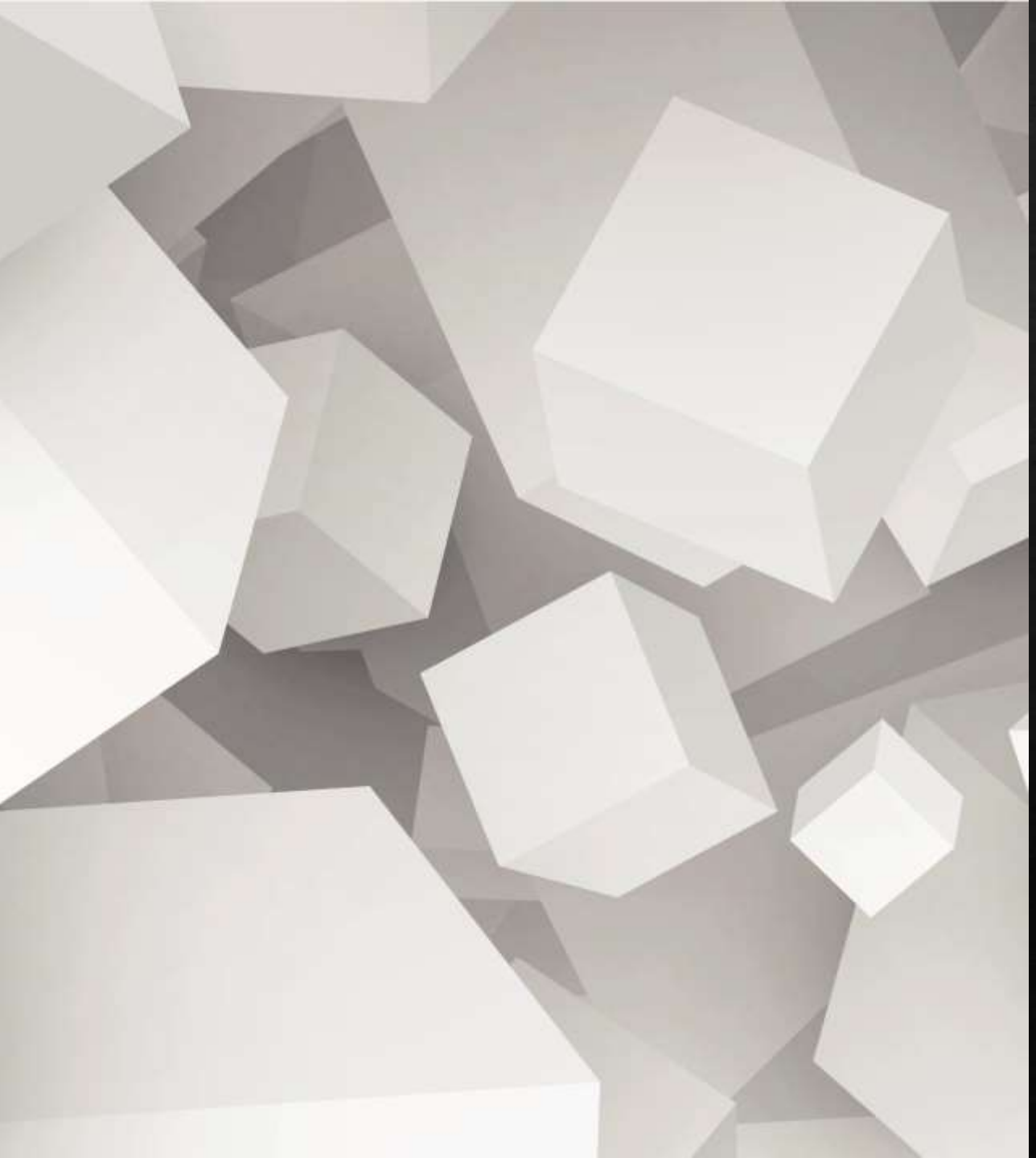
-Admin Page

1.No. of Student's Enrolled
2.Add & Remove Algorithms.
3.Sign-in Count.

-Student Page

1.Experiment Page
2. Analysis
3.Dashboard

-Home Page



Conclusion

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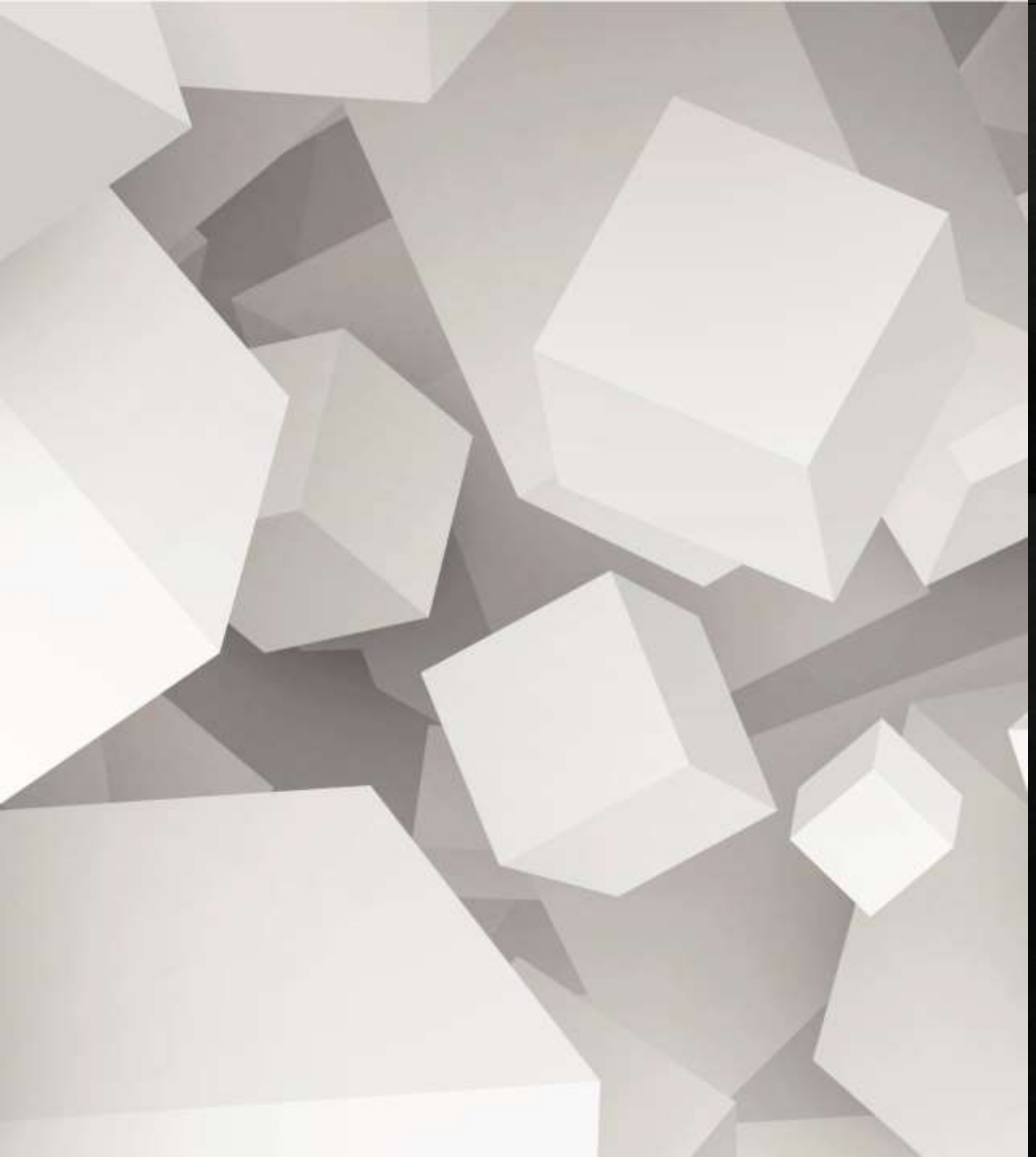

Thank You