

**Major Project
(23ONMCR-753)
of the programme**

Master of Computer Applications

Batch - January 2024

Fourth Semester

CENTRE FOR DISTANCE & ONLINE EDUCATION

CHANDIGARH UNIVERSITY

Submitted By: Deepak kumar

Enrollment No: O24MCA160426

SYNOPSIS

1. Title of the Project

Student Performance Predictor using Machine Learning

2. Objective

To build a web-based intelligent system that predicts whether a student will pass or fail based on academic parameters like attendance, study hours, assignment scores, and previous marks using a logistic regression machine learning model.

3. Resources Required

Hardware:

- Intel i3 or above processor
- Minimum 4GB RAM
- Internet connectivity

Software & Tools:

- VS Code (IDE)
- Node.js (Backend)
- React.js (Frontend)
- Python (ML microservice)
- Express.js (Server)
- MongoDB (Database)
- Joblib, Pandas, Scikit-learn (ML Libraries)

Table Of Contents

Title	2
Declaration	3
Acknowledgement	3
Abstract	3
Introduction	4
SDLC of the project	4
Design	4
Registration View-	5
Login View-	9
Home / Students List View -	13
Student Details View -	19
Add New Student View -	22
Edit Student Details View -	26
Logout View -	29
Coding & Implementation	30
SOURCE CODE & PPT — https://github.com/Deepakkarn56/Student-Performance-Analyzer	30
Testing	31
Application	31
Conclusion	31
Bibliography(APA Style)	32

Title

STUDENT PERFORMANCE Analyzer USING MACHINE LEARNING

**Major Project Report Submitted in partial fulfillment of the requirement for the award of
the degree of MASTER OF COMPUTER APPLICATIONS (MCA)**

Submitted By: **Deepak kumar**

Enrollment No: **O24MCA160426**

Centre for Distance and Online Education
Chandigarh University
December 2025

Certificate

This is to certify that the project entitled "**Student Performance Predictor using Machine Learning**" is a bona fide work carried out by **Deepak kumar**(Enrollment No: **O24MCA160426**) in partial fulfillment for the award of the degree of **Master of Computer Applications**.

This project work is original and has not been submitted elsewhere for any other degree or diploma.

Declaration

I hereby declare that the project report entitled “**Student Performance Analyzer using Machine Learning**” submitted to **Chandigarh University** is a record of original work done by me. This project has not been submitted anywhere else for the award of any degree or diploma.

Acknowledgement

I am expressing my sincere gratitude to **Chandigarh University** for providing the opportunity to undertake this project. I also thank my friends and the online developer community for their support and guidance during the development process.

Abstract

This project outlines the development of a web-based application that predicts student performance using machine learning. By analyzing key input parameters such as attendance, study hours, assignment scores, and previous marks, the system predicts whether a student is likely to pass or fail.

The model is built using **Logistic Regression** and integrated with a **Node.js and React** application, using a **Python microservice** for predictions. The aim is to help institutions proactively identify students at risk.

Introduction

Educational institutions face the challenge of improving student outcomes. Predictive analytics through machine learning helps forecast academic performance. This project provides a solution that allows teachers to use student data to predict outcomes and intervene early if necessary.

SDLC of the project

Software Development Life Cycle (SDLC) model followed:

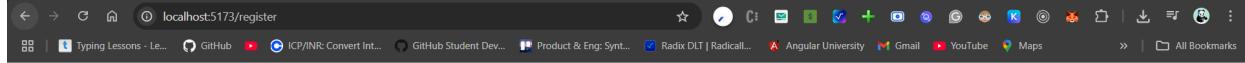
- Requirement Analysis
- System Design
- Implementation
- Testing
- Deployment
- Maintenance

Design

System Architecture Includes:

- Frontend: React.js
- Backend: Node.js
- ML Microservice: Python (Logistic Regression)
- Database: MongoDB
- Communication: Node.js `child_process` to call Python script

Registration View-



Teacher Register

name

Email

Password

REGISTER

Already have an account [Log in here.](#)



Teacher Register

name

name is required

Email

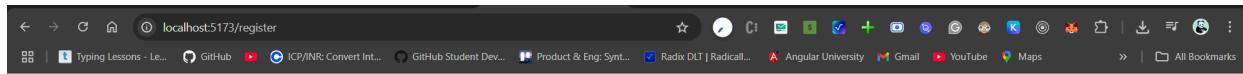
Email is required

Password

Password is required

REGISTER

Already have an account [Log in here.](#)



Teacher Register

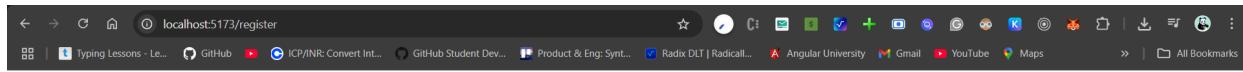
name

Email
 Invalid email format

Password

REGISTER

Already have an account [Log in here.](#)



Teacher Register

name

Email

Password
 Password must be at least 6 characters

REGISTER

Already have an account [Log in here.](#)



Teacher Register

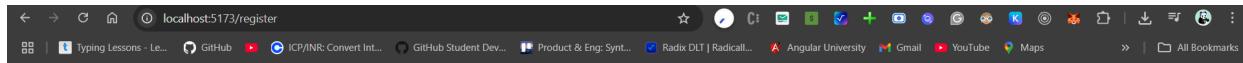
name

Email

Password

SUBMITTING...

Already have an account [Log in here.](#)



Teacher Register

name

Email

Password

REGISTER

Already have an account [Log in here.](#)

localhost:5173/register

Teacher Register

name

Email

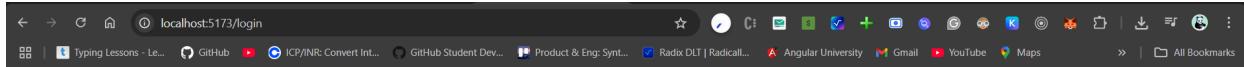
Password

REGISTER

Already have an account [Log inhere.](#)

Registration done successfully

Login View-



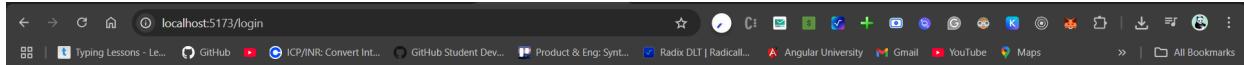
Teacher Login

Email

Password

LOGIN

[Teacher registration](#)



Teacher Login

Email

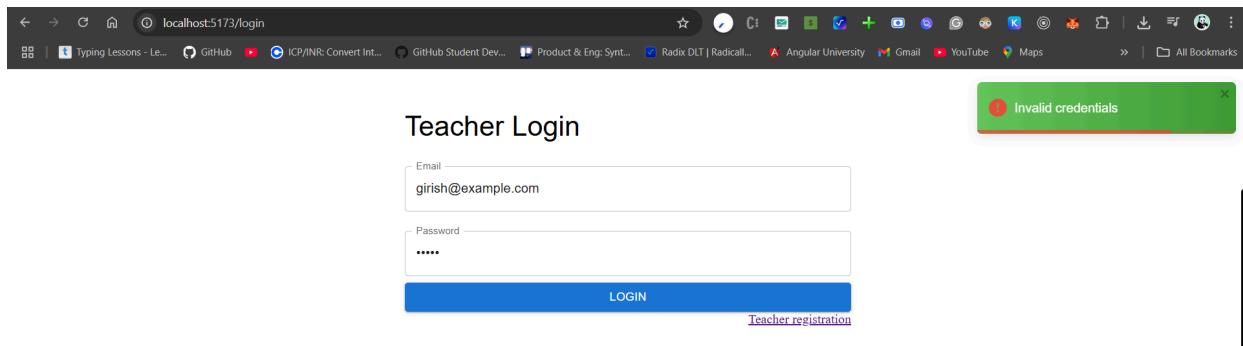
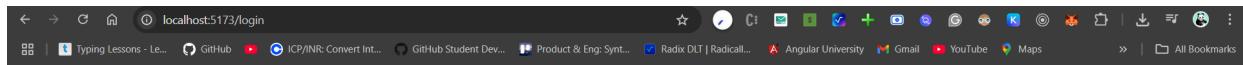
Email is required

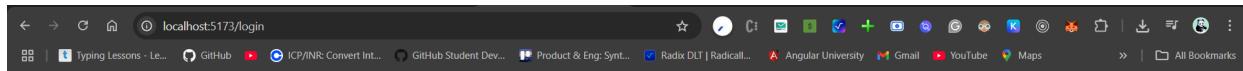
Password

Password is required

LOGIN

[Teacher registration](#)





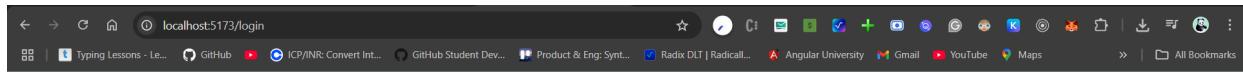
Teacher Login

Email

Password

SUBMITTING...

[Teacher registration](#)



Teacher Login

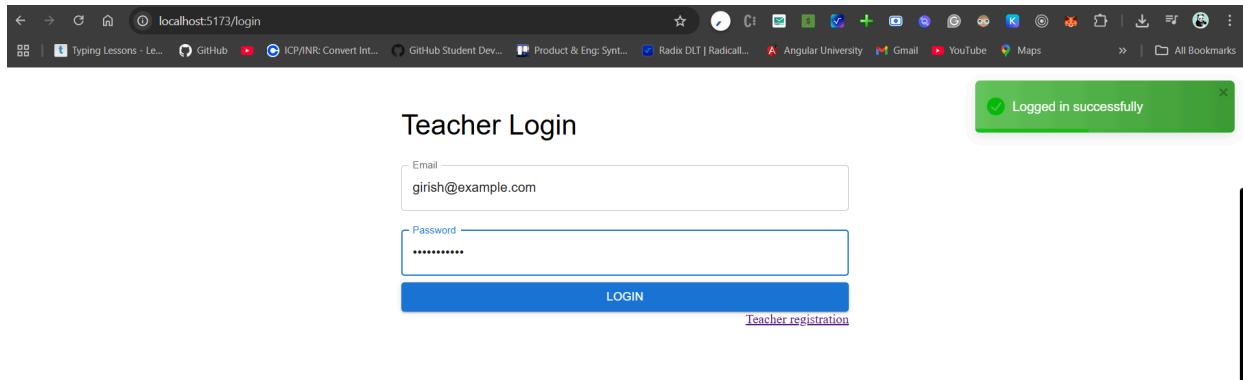
Email

Password

LOGIN

[Teacher registration](#)

Something went wrong



Home / Students List View -

localhost:5173

Girish

Log out

Students List

Search by name SEARCH

ADD STUDENT

localhost:5173

Girish

Log out

Students List

Search by name SEARCH

ADD STUDENT

No data available.

localhost:5173

Girish

Students List

Search by name SEARCH ADD STUDENT

No data available.

An error occurred while fetching students list

This screenshot shows a web browser window with the URL 'localhost:5173'. The title bar says 'Girish'. The main content area has a heading 'Students List'. Below it is a search bar with placeholder 'Search by name' and a blue 'SEARCH' button. To the right is a blue 'ADD STUDENT' button. A message 'No data available.' is displayed. There are two green notification boxes at the top right, both stating 'An error occurred while fetching students list' with a red exclamation mark icon.

localhost:5173

Jeevan Kumar Log out

Students List

Search by name SEARCH ADD STUDENT

Student Name	Attendance	Study Hours	Previous Marks	Assignment Score	Recent Prediction	Action Buttons
Alok	47%	8 hrs	49	6	Pass	VIEW DETAILS PREDICT RESULT
Aman	45%	1 hrs	8	4	Fail	VIEW DETAILS PREDICT RESULT
Divya	78%	13 hrs	73	7.9	Pass	VIEW DETAILS PREDICT RESULT
Hari	67%	15 hrs	75	8.5	Pass	VIEW DETAILS PREDICT RESULT
Hemaksh	9%	5 hrs	5	7	Fail	VIEW DETAILS PREDICT RESULT
Karan	85%	20 hrs	90	9.3	Pass	VIEW DETAILS PREDICT RESULT

1 2 3 >

This screenshot shows a web browser window with the URL 'localhost:5173'. The title bar says 'Jeevan Kumar'. In the top right corner, there is a red 'Log out' button. The main content area has a heading 'Students List'. Below it is a search bar with placeholder 'Search by name' and a blue 'SEARCH' button. To the right is a blue 'ADD STUDENT' button. The page displays a table with six rows, each representing a student: Alok, Aman, Divya, Hari, Hemaksh, and Karan. Each row contains the student's name, attendance percentage, study hours, previous marks, assignment score, recent prediction (either 'Pass' or 'Fail' in a colored box), and two buttons: 'VIEW DETAILS' and 'PREDICT RESULT'. At the bottom of the table, there is a navigation bar with page numbers 1, 2, 3, and '>'.

localhost:5173

Jeevan Kumar Log out

Students List

Search by name SEARCH ADD STUDENT

Name	Attendance	Study Hours	Previous Marks	Assignment Score	Recent Prediction
Rahul Kumar	95%	4 hrs	22	10	Pass
Ravi	53%	7 hrs	50	5.8	..
Ravi Kumar	75%	4 hrs	60	85	Pass
Rohit	56%	9 hrs	52	6.4	..
Sneha	70%	14 hrs	76	8	..
Suresh	66%	10 hrs	65	7.4	..

VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT

1 2 3 >

localhost:5173

Jeevan Kumar Log out

Students List

Search by name al SEARCH ADD STUDENT

Name	Attendance	Study Hours	Previous Marks	Assignment Score	Recent Prediction
Alok	47%	8 hrs	49	6	Pass
Komal	93%	21 hrs	89	9.6	..

VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT

< 1 >

Jeevan Kumar

Log out

Students List

Search by name SEARCH

[ADD STUDENT](#)

Alok

Attendance: 47%
Study Hours: 8 hrs
Previous Marks: 49
Assignment Score: 6

Recent Prediction: Pass

[VIEW DETAILS](#) [PREDICT RESULT](#)

Aman

Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

Recent Prediction: Fail

[VIEW DETAILS](#) [PREDICT RESULT](#)

Divya

Attendance: 78%
Study Hours: 13 hrs
Previous Marks: 73
Assignment Score: 7.9

Recent Prediction: ..

[VIEW DETAILS](#) [PREDICT RESULT](#)

localhost:5173

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Students List

Search by name SEARCH

[ADD STUDENT](#)

Alok

Attendance: 47%
Study Hours: 8 hrs
Previous Marks: 49
Assignment Score: 6

Recent Prediction: Pass

[VIEW DETAILS](#) [PREDICT RESULT](#)

Aman

Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

Recent Prediction: Fail

[VIEW DETAILS](#) [PREDICT RESULT](#)

Divya

Attendance: 78%
Study Hours: 13 hrs
Previous Marks: 73
Assignment Score: 7.9

Recent Prediction: ..

[VIEW DETAILS](#) [PREDICTING](#)

Hari

Attendance: 67%
Study Hours: 15 hrs
Previous Marks: 75
Assignment Score: 8.5

Recent Prediction: Pass

Hemaksh

Attendance: 9%
Study Hours: 5 hrs
Previous Marks: 5
Assignment Score: 7

Recent Prediction: Fail

Karan

Attendance: 85%
Study Hours: 20 hrs
Previous Marks: 90
Assignment Score: 9.3

Recent Prediction: ..

localhost:5173

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Jeevan Kumar

An error occurred while predicting the result

Students List

Search by name **SEARCH**

ADD STUDENT

Student Name	Attendance	Study Hours	Previous Marks	Assignment Score	Recent Prediction	Action
Alok	47%	8 hrs	49	6	Pass	VIEW DETAILS PREDICT RESULT
Aman	4%	1 hrs	8	4	Fail	VIEW DETAILS PREDICT RESULT
Divya	78%	13 hrs	73	7.9	Pass	VIEW DETAILS PREDICT RESULT
Hari	67%	15 hrs	75			VIEW DETAILS PREDICT RESULT
Hemaksh	9%	5 hrs	5			VIEW DETAILS PREDICT RESULT
Karan	85%	20 hrs	90			VIEW DETAILS PREDICT RESULT

localhost:5173

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Jeevan Kumar

Prediction done successfully. → Aman: Fail

Students List

Search by name SEARCH ADD STUDENT

Alok Attendance: 47% Study Hours: 8 hrs Previous Marks: 49 Assignment Score: 6 Recent Prediction: Pass	Aman Attendance: 4% Study Hours: 1 hrs Previous Marks: 8 Assignment Score: 4 Recent Prediction: Fail	Divya Attendance: 78% Study Hours: 13 hrs Previous Marks: 73 Assignment Score: 7.9 Recent Prediction: Pass
Hari Attendance: 67% Study Hours: 15 hrs Previous Marks: 75	Hemaksh Attendance: 9% Study Hours: 5 hrs Previous Marks: 5	Karan Attendance: 85% Study Hours: 20 hrs Previous Marks: 90

VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT

localhost:5173

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Jeevan Kumar

Prediction done successfully. → Divya: Pass

Students List

Search by name SEARCH ADD STUDENT

Alok Attendance: 47% Study Hours: 8 hrs Previous Marks: 49 Assignment Score: 6 Recent Prediction: Pass	Aman Attendance: 4% Study Hours: 1 hrs Previous Marks: 8 Assignment Score: 4 Recent Prediction: Fail	Divya Attendance: 78% Study Hours: 13 hrs Previous Marks: 73 Assignment Score: 7.9 Recent Prediction: Pass
Hari Attendance: 67% Study Hours: 15 hrs Previous Marks: 75	Hemaksh Attendance: 9% Study Hours: 5 hrs Previous Marks: 5	Karan Attendance: 85% Study Hours: 20 hrs Previous Marks: 90

VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT VIEW DETAILS PREDICT RESULT

Student Details View -

 Jeevan Kumar Log out

Student Details

Name: Divya
Attendance: 78%
Study Hours: 13 hrs
Previous Marks: 73
Assignment Score: 7.9

[EDIT DETAILS](#) [PREDICT RESULT](#)

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
5/29/2025, 12:44:25 PM	78%	13	73	7.9	Pass
5/29/2025, 12:43:11 PM	78%	13	73	7.9	Pass

 Jeevan Kumar Log out

Student Details

Name: Karan
Attendance: 85%
Study Hours: 20 hrs
Previous Marks: 90
Assignment Score: 9.3

[EDIT DETAILS](#) [PREDICT RESULT](#)

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
No Prediction History					

A screenshot of a web browser window. The address bar shows the URL: localhost:5173/students/6837f2f043236a70780cc0c7. The page title is "Jeevan Kumar". The main content area displays "Student Details" for a student named Karan, with the following information:
Name: Karan
Attendance: 85%
Study Hours: 20 hrs
Previous Marks: 90
Assignment Score: 9.3

Log out

[EDIT DETAILS](#) [PREDICTING...](#)

Student Details

Name: Karan
Attendance: 85%
Study Hours: 20 hrs
Previous Marks: 90
Assignment Score: 9.3

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
------	------------	-------------	----------------	------------------	------------------

No Prediction History

A screenshot of a web browser window. The address bar shows the URL: localhost:5173/students/6837f2f043236a70780cc0c3. The page title is "Jeevan Kumar". A green notification bar at the top right says "An error occurred while predicting the result". The main content area displays "Student Details" for a student named Aman, with the following information:
Name: Aman
Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

An error occurred while predicting the result

[EDIT DETAILS](#) [PREDICT RESULT](#)

Student Details

Name: Aman
Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
5/29/2025, 12:57:58 PM	4%	1	8	4	Fall
5/29/2025, 12:45:38 PM	4%	1	8	4	Fall
5/29/2025, 11:14:35 AM	4%	1	8	4	Fall
5/29/2025, 11:14:24 AM	4%	12	8	4	Pass
5/29/2025, 11:14:09 AM	4%	12	8	7.2	Pass
5/29/2025, 11:13:57 AM	4%	12	68	7.2	Pass
5/29/2025, 11:13:32 AM	80%	12	68	7.2	Pass

localhost:5173/students/6837f2f043236a70780cc0c3

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Jeevan Kumar

Prediction done successfully. →
Aman: Fail

Student Details

Name: Aman
Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

[EDIT DETAILS](#) [PREDICT RESULT](#)

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
5/29/2025, 12:57:58 PM	4%	1	8	4	Fail
5/29/2025, 12:45:38 PM	4%	1	8	4	Fail
5/29/2025, 11:14:35 AM	4%	1	8	4	Fail
5/29/2025, 11:14:24 AM	4%	12	8	4	Pass
5/29/2025, 11:14:09 AM	4%	12	8	7.2	Pass
5/29/2025, 11:13:57 AM	4%	12	68	7.2	Pass
5/29/2025, 11:13:32 AM	80%	12	68	7.2	Pass

localhost:5173/students/6837f2f043236a70780cc0c7

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Jeevan Kumar

Prediction done successfully. →
Karan: Pass

Student Details

Name: Karan
Attendance: 85%
Study Hours: 20 hrs
Previous Marks: 90
Assignment Score: 9.3

[EDIT DETAILS](#) [PREDICT RESULT](#)

Prediction History

Date	Attendance	Study Hours	Previous Marks	Assignment Score	Predicted Result
5/29/2025, 12:56:40 PM	85%	20	90	9.3	Pass
5/29/2025, 12:54:43 PM	85%	20	90	9.3	Pass

Add New Student View -

localhost:5173/students/add

Jeevan Kumar Log out

Add New Student

Name

Attendance (%)

Study Hours

Previous Marks

Assignment Score

ADD STUDENT

localhost:5173/students/add

Jeevan Kumar Log out

Add New Student

Name
Name is required

Attendance (%)
Attendance is required

Study Hours
Study hours required

Previous Marks
Previous marks required

Assignment Score

Assignment score required

ADD STUDENT

localhost:5173/students/add

Jeevan Kumar Log out

Add New Student

Name: Diljit Singh

Attendance (%): 500

attendance must be less than or equal to 100

Study Hours: 76

Previous Marks: 450

previousMarks must be less than or equal to 100

Assignment Score: 4.9

ADD STUDENT

localhost:5173/students/add

Jeevan Kumar Log out

Add New Student

Name: Diljit Singh

Attendance (%): 50

Study Hours: 76

Previous Marks: 45

Assignment Score: 15

assignmentScore must be less than or equal to 10

ADD STUDENT

localhost:5173/students/add

Log out

Add New Student

Name
Rupinder Singh

Attendance (%)
15

Study Hours
2

Previous Marks
14

Assignment Score
2.6

ADDING STUDENT...

localhost:5173/students/add

Adding student failed

Add New Student

Name
Ronny singh

Attendance (%)
78

Study Hours
1

Previous Marks
46

Assignment Score
1.5

ADD STUDENT

localhost:5173/students/add

Jeevan Kumar

Student added successfully

Add New Student

Name: Ronny singh

Attendance (%): 78

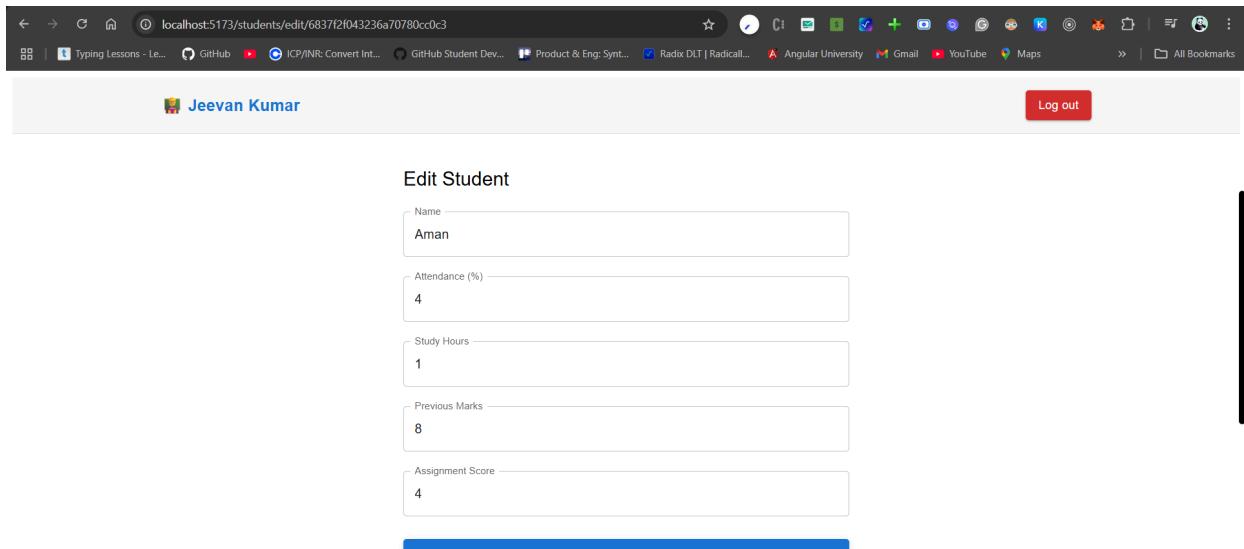
Study Hours: 1

Previous Marks: 46

Assignment Score: 1.5

ADD STUDENT

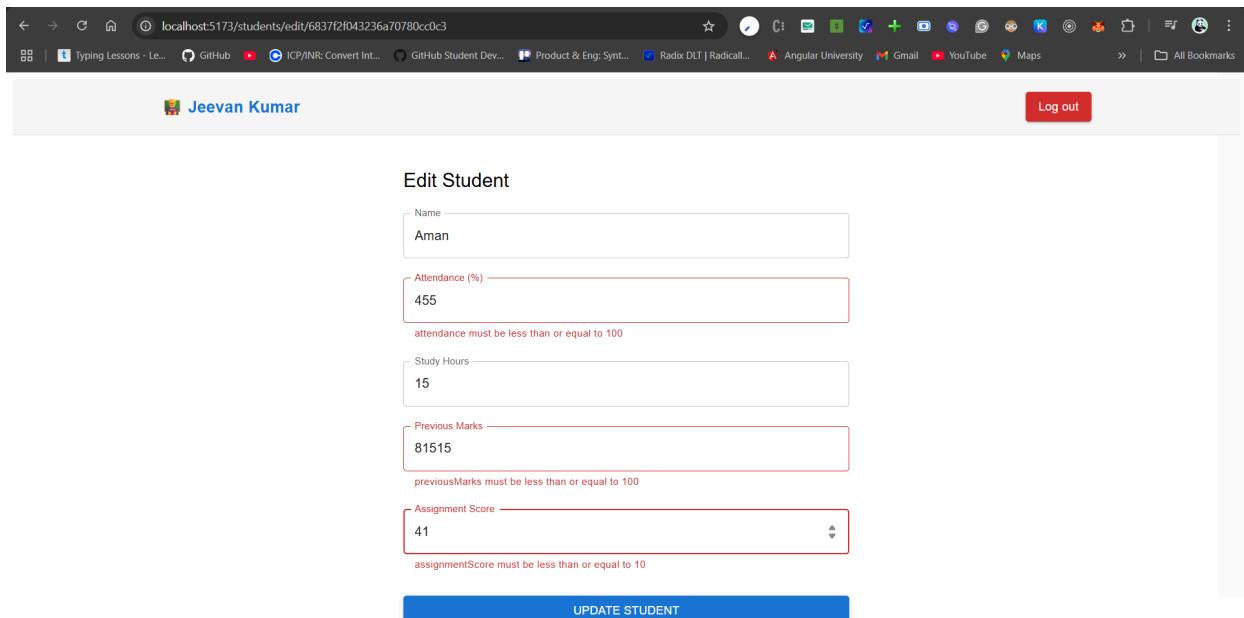
Edit Student Details View -



A screenshot of a web browser window titled "Edit Student". The URL in the address bar is "localhost:5173/students/edit/6837f2f043236a70780cc0c3". The page displays a form with five input fields: Name (Aman), Attendance (%) (4), Study Hours (1), Previous Marks (8), and Assignment Score (4). A blue "UPDATE STUDENT" button is at the bottom.

Name	Aman
Attendance (%)	4
Study Hours	1
Previous Marks	8
Assignment Score	4

UPDATE STUDENT



A screenshot of a web browser window titled "Edit Student". The URL in the address bar is "localhost:5173/students/edit/6837f2f043236a70780cc0c3". The page displays a form with five input fields. The "Attendance (%)" field contains "455", which is highlighted in red with an error message: "attendance must be less than or equal to 100". The "Previous Marks" field contains "81515", which is highlighted in red with an error message: "previousMarks must be less than or equal to 100". The "Assignment Score" field contains "41", which is highlighted in red with an error message: "assignmentScore must be less than or equal to 100". A blue "UPDATE STUDENT" button is at the bottom.

Name	Aman
Attendance (%)	455
Study Hours	15
Previous Marks	81515
Assignment Score	41

attendance must be less than or equal to 100
previousMarks must be less than or equal to 100
assignmentScore must be less than or equal to 100

UPDATE STUDENT



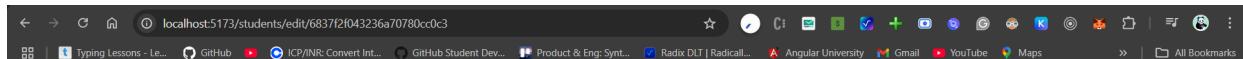
Jeevan Kumar

Log out

Edit Student

Name	Aman
Attendance (%)	4
Study Hours	1
Previous Marks	8
Assignment Score	4

UPDATING STUDENT...



Jeevan Kumar

Update failed

Edit Student

Name	Aman
Attendance (%)	4
Study Hours	1
Previous Marks	8
Assignment Score	4

UPDATE STUDENT

localhost:5173/students/edit/6837f2f043236a70780cc0c3

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Jeevan Kumar

Student updated successfully

Edit Student

Name: Aman

Attendance (%): 4

Study Hours: 1

Previous Marks: 8

Assignment Score: 4

UPDATE STUDENT

Logout View -

The screenshot shows a web browser window with the URL `localhost:5173/students/6837f2f043236a70780cc0c3`. The page displays "Student Details" for a student named Aman, with the following information:
Name: Aman
Attendance: 4%
Study Hours: 1 hrs
Previous Marks: 8
Assignment Score: 4

A modal dialog box titled "Confirm Logout" is centered on the screen, asking "Are you sure you want to log out?". It contains two buttons: "CANCEL" and "LOGOUT".

Below the modal, there is a "Prediction History" table:

Date	Attendance	SL	Score	Assignment Score	Predicted Result
5/29/2025, 1:31:34 PM	4%	1	8	4	Fail
5/29/2025, 12:57:58 PM	4%	1	8	4	Fail
5/29/2025, 12:45:38 PM	4%	1	8	4	Fail
5/29/2025, 11:14:35 AM	4%	1	8	4	Fail
5/29/2025, 11:14:24 AM	4%	12	8	4	Pass
5/28/2025, 11:14:09 AM	4%	12	8	7.2	Pass
5/29/2025, 11:13:57 AM	4%	12	68	7.2	Pass
5/29/2025, 11:13:32 AM	80%	12	68	7.2	Pass

The screenshot shows a web browser window with the URL `localhost:5173`. The page displays a "Students List" with five student entries: Alok, Ankit, Diljit Singh, Divya, Hari, and Hemaksh. Each student card includes their name, attendance, study hours, previous marks, assignment score, and recent prediction (Pass or Fail). Below each card are "VIEW DETAILS" and "PREDICT RESULT" buttons.

A modal dialog box titled "Confirm Logout" is centered on the screen, asking "Are you sure you want to log out?". It contains two buttons: "CANCEL" and "LOGOUT".

A green notification bar at the top right of the page says "Something went wrong !!".

The screenshot shows a web application interface titled "Students List". At the top, there is a navigation bar with various links and a user profile for "Jeevan Kumar". A green success message box displays "Logged Out Successfully". Below the header, there is a search bar with the placeholder "Search by name" and a "SEARCH" button. To the right, there is a blue "ADD STUDENT" button. The main content area displays six student profiles in cards:

- Alok**: Attendance: 47%, Study Hours: 8 hrs, Previous Marks: 49, Assignment Score: 6. Recent Prediction: Pass. Buttons: VIEW DETAILS, PREDICT RESULT.
- Ananya**: Attendance: 50%, Study Hours: 76 hrs, Previous Marks: 45, Assignment Score: 4.9. Recent Prediction: Fail. Buttons: CANCEL, LOGOUT (highlighted).
- Diljit Singh**: Attendance: 50%, Study Hours: 76 hrs, Previous Marks: 45, Assignment Score: 4.9. Recent Prediction: -. Buttons: VIEW DETAILS, PREDICT RESULT.
- Divya**: Attendance: 78%, Study Hours: 13 hrs, Previous Marks: 73. Buttons: VIEW DETAILS, PREDICT RESULT.
- Hari**: Attendance: 67%, Study Hours: 15 hrs, Previous Marks: 75. Buttons: VIEW DETAILS, PREDICT RESULT.
- Hemaksh**: Attendance: 9%, Study Hours: 5 hrs, Previous Marks: 5. Buttons: VIEW DETAILS, PREDICT RESULT.

Coding & Implementation

The application consists of:

- User auth (Teacher)
- Student management system (CRUD)
- Python ML microservice trained on a synthetic dataset of 1000 students
- A React interface to collect data and show a prediction

SOURCE CODE & PPT —

<https://github.com/Deepakkarn56/Student-Performance-Analyzer>

Prediction uses logistic regression on attendance, study hours, previous marks, and assignment score.

Testing

- Accuracy: Achieved ~85% accuracy using real and synthetic data
- Integration Testing between frontend/backend and Python ML
- Validations and error handling for edge cases (missing fields, invalid input)

Application

This system can be used by:

- Teachers to predict outcomes before exams
- Institutions to identify students needing support
- EdTech platforms for personalized learning insights

Conclusion

This project showcases a sophisticated real-world application of machine learning technology specifically tailored for the education sector. Designed with scalability in mind, the system is built to handle increasing volumes of data and users seamlessly, making it suitable for institutions of various sizes, from small schools to large universities. Its practical implementation ensures that

it addresses genuine educational challenges, providing actionable insights that educators and administrators can rely on.

The user-friendly interface and intuitive design make it accessible to users with varying degrees of technical expertise, facilitating smooth adoption without requiring extensive training. By leveraging intelligent algorithms, this system enhances decision-making processes related to student performance, curriculum development, and resource allocation. Ultimately, it aims to improve overall learning outcomes, helping educators identify areas where students may need additional support and enabling personalized learning experiences.

In essence, this intelligent educational system is a powerful tool that not only supports academic stakeholders in making informed decisions but also contributes meaningfully to the evolution of modern educational practices by integrating cutting-edge machine learning techniques.

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END OF REPORT