DiagnoCare

Project Report

B. Tech. CE Semester – VI

Subject: SDP

Dharmsinh Desai University, Nadiad

Faculty of Technology

Department of Computer Engineering

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Certificate

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Department of Computer Engineering

This is to certify that the project entitled "**DiagnoCare**", in the subject of Advanced Technology is a Bonafede report of the work carried out by _____ of Department of Computer Engineering semester VI during the Academic Year 2023-2024.

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Contents

Abstract

- DiagnoCare is a comprehensive and intelligent software solution designed to assist healthcare professionals in accurately diagnosing various medical conditions based on medical imaging data and other numerical Data .
- The primary focus of this system is to analyze medical images, such as X-rays, CT scans, MRIs and Other attributes , to identify patterns and anomalies associated with specific diseases.
- The software employs state-of-the-art deep learning models and image processing algorithms, allowing for the automated detection of conditions ranging from respiratory disorders like Diabetes , Brain Tumor , Lung Cancer, Alzhimer's .

Introduction

DiagnoCare is a machine learning-powered system designed to assist healthcare professionals in disease diagnosis. By leveraging the power of data analysis and pattern recognition, DiagnoCare aims to enhance diagnostic accuracy, efficiency, and early detection of potential medical conditions.

TechStack

Technology

- **Front-end**: React.js
- **Back-end:** Java
- **Database:** MongoDB

Platform

- **Google Colab:** code editor
- **GitHub:** Version Control and Collaboration

Tools

- **MongoDBCompass:** Query Visualization
- **Postman:** API Testing and Development

Software Requirement Specification (SRS)

1. Introduction

DiagnoCare is a machine learning-powered system designed to assist healthcare professionals in disease diagnosis.

1.1 Purpose

The purpose of this document is to outline the software requirements for the development ofDiagnoCare, an efficient disease diagnosis software. DiagnoCare allows doctors to generate reports, create and track patient history while patients can take precautions accordingly.

1.2 Project Scope

- The project scope includes building a comprehensive diagnostic software to assist healthcare professionals (doctors) and patients in the disease diagnosis process
- Doctors can generate reports for a particular patient and can also track history of patients and patients can take precautions accordingly.

1.3 Environment Characteristics

- It will mainly interact with the online environment.
- No external hardware interface is required.

1.4 Definitions, Abbreviations and Acronyms

- SRS -System Requirements Specification

1.5 References

- Udemy
- Coursera

2. Overall Description

2.1 Software Perspective

- A disease diagnosis web application with an intuitive interface, stringent security measures, accurate diagnostic algorithms, and seamless integration with healthcare systems to provide real-time updates

2.2 Software features

- User-Friendly Interface:
  Intuitive design for easy navigation and use.
- Security Measures:
  Authentication and Authorization Methods
- Diagnostic Algorithms:
  Accurate and up-to-date algorithms for precise diagnoses.
  Integration of machine learning for continuous improvement.
- Integration Capabilities:
  Interoperability with existing healthcare systems and EHRs.
  APIs for third-party integration.

2.3 User class and characteristics

1 . Healthcare Professionals :

- Characteristics:
  - Trained medical professionals (doctors, nurses, etc.).
  - Busy schedules with a need for efficient communication.
  - Technical proficiency in using medical software.
- Needs:
  - Integration with existing healthcare systems.
  - Collaboration tools for communication with patients.
  - Quick access to patient data for informed decision-making.
  - Keep track of patient's data and report report generation

2.4 Operating environment

It can be run on any hardware platform regardless of the operating system.

2.5 Design and implementation constraint

- MongoDB
- React
- Spring Boot

2.6 User Documentation

Not Applicable

2.7 Assumptions and dependencies

- There is only one administrator
- Each registered user must have an email id and a password
- Internet connection
- Proper browser support

3. External Interface Requirements

3.1 User Interface

Screen is as per the UI design of the given sample screen.

3.2 Hardware Interface

Not Applicable

3.3 Software Interface

- MongoDB for database storage.
- Spring Boot and Hibernate for Model integration and maintaining patient's data
- React.js for the front-end user interface.
- Spring Security for authentication and authorization of users

4. System Features

R1 : Register user
Description: Users will enter their details and will be able to register themselves.

- R1.1 : selects Register
  Input : User will select register option
  Output : user will be prompted with to enter the details
- R1.2 : register user
  Input : user will enter his/her detail
  Output : user will be registered and will be redirected to login page.

R2 : Login to System
Description: User will enter the credentials and will be able to login

- R2.1 : selects login
  Input : User will enter credentials
  Output : Users will be prompted to enter their credentials.

- R2.2: login user
  Input : user enters credentials
  Output : user will be logged in to the system and will be redirected to the home page.

R3 : Accurate Disease Diagnosis
Description: Accurate Disease detection and extent/level of disease will be displayed.

R4 : Generate patient report
Description: The Software will generate a patient's report and can download reports as well.

R5 : Save patient history
Description: Users of software can maintain a patient's history and can change any details as well.
Moreover, User can also compare the patient's current and previous data.

5. Other non functional requirements

5.1 Performance Requirements

- It is required that the website runs smoothly and fast to get faster access to it. The performance of the website depends upon web server speed and upon network speed. This is web based therefore it also depends upon internet speed.

- We will make such a website that will perform well in all the situations like low speed network as well as high speed so.

5.2 Safety Requirements

- Database access permitted to only Database Administrator.
- Use of secure servers.
- Backup in case of a software crash.
- Payment is handled through secure gateways.

5.3 Security Requirements

- Login activity
- Data integrity checks

5.4 Software Quality Attributes

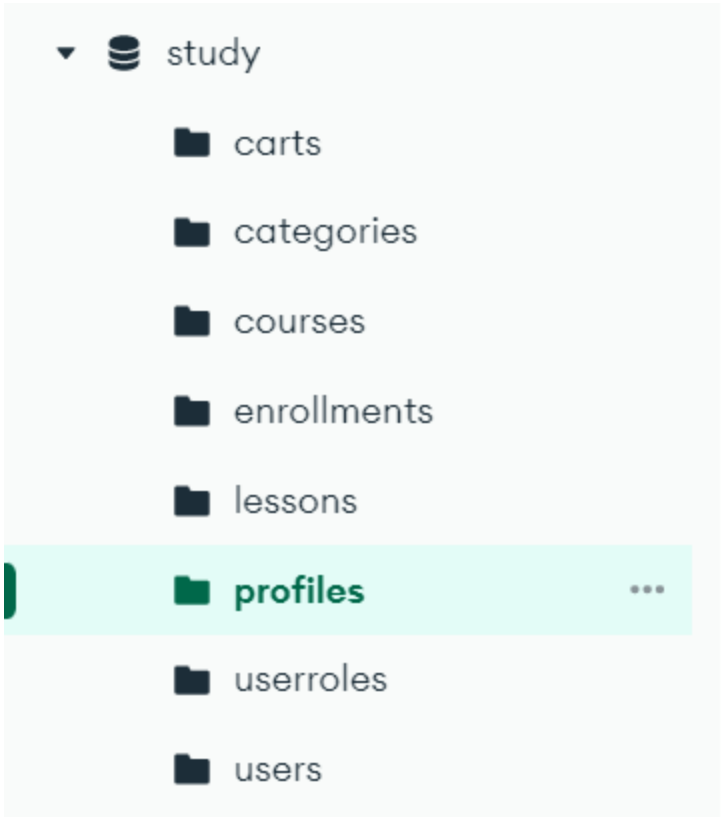
- The source code of the request is not going to be open source. It will not be free for further modifications and improvements.

5.5 Business Rules

- Illegal duplication of the project and interface is strictly to be dealt with.

Database Design

Structure:



carts

	_id ObjectId	user ObjectId	items Array	totalPrice Int32	status String
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2	ObjectId('6505e12d7c4d5dd1e77…	ObjectId('64e7528ae8ee087031a…	[] 0 elements	0	"active"

categories

	_id String	no Int32	categoryName String
1	"64f0190d663a35dc2c815b24"	1	"test1"

courses

	_id ObjectId	courseName String	courseDescription String	image String	instructor ObjectId
1	ObjectId('65019f6e2dbf89686d3…	"test1"	"test1"	"https://webimages.mongodb.co…	ObjectId('64e755546ef3
2	ObjectId('6501b00c28ad28f8458…	"test2"	"test2"	"https://encrypted-tbn0.gstat…	ObjectId('64e755546ef3
3	ObjectId('65027a77329c2c85f53…	"test3"	"test3"	"https://encrypted-tbn0.gstat…	ObjectId('64e755546ef3
4	ObjectId('6505cb7aae56f741cf6…	"test1"	"test1"	"https://media.istockphoto.co…	ObjectId('6505c997ae56

enrollments

	_id ObjectId	student ObjectId	course Array	approved Boolean	__v Int32
1	ObjectId('650924dda67983aef4f…	ObjectId('64e7528ae8ee087031a…	[] 1 elements	true	0
2	ObjectId('650af225cfe56db9d89…	ObjectId('64e755546ef32241f70…	[] 1 elements	true	0
3	ObjectId('650af225cfe56db9d89…	ObjectId('64e755546ef32241f70…	[] 1 elements	true	0
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users

	_id ObjectId	first_name String	last_name String	email String	password String
1	ObjectId('64e6ce5a5f3dc51c6b6…	"test1"	"test1"	"email@test2.com"	"$2a$10$azXmCQnIMx0RyL
2	ObjectId('64e7528ae8ee087031a…	"isha"	"paghdal"	"ishapaghdal@gmail.com"	"$2a$10$M2nV.ynpl7iEaC
3	ObjectId('64e755546ef32241f70…	"isha"	"paghdal"	"ishapaghdal0@gmail.com"	"$2a$10$Q/67P71tmUfiJT
4	ObjectId('64e77fcd1b9036b2cfe…	"isha"	"paghdal"	"ishapaghdal2@gmail.com"	"$2a$10$KY0poPbMUBfvYh
5	ObjectId('6505c997ae56f741cf6…	"isha"	"paghdal"	"ishapaghdal1@gmail.com"	"$2a$10$/3lYLyGH.yYsjE

Implementation Detail

i) Modules created and brief description of each modules.

- **Authentication Module:** Handles user registration and login.
- **Instructor Dashboard:** Allows instructors to create, update, and manage courses and lessons.
- **Student Dashboard:** Enables students to search for courses, enroll, and make course purchases.
- **Shopping Cart:** Manages the selection of courses for checkout.
- **Certificate Generation:** Issues certificates upon course completion.

Testing

Unit Test (Backend - Node.js/Express):

Test Case 1: Create a New Instructor

- Input:
  Instructing user's valid data (name, email, etc.).
- Expected Output:
  The system successfully creates a new instructor user.

Test Case 2: Retrieve User Data

- Input:
  User ID of an existing user.
- Expected Output:
  The system correctly retrieves the user data

Integration Test (User and Role Management):

Test Case 3: User Role Assignment

- Input:
  New user registration data.
- Expected Output:
  The user's role is correctly assigned based on the registration data (Instructor or Student).

Test Case 4: Admin Role Modification

- Input:
  An admin updates the roles and permissions of a user.
- Expected Output:
  The system successfully updates the user's roles and permissions.

Functional Test (Course Management):

Test Case 5: Create a New Course

- Input:
  Instructor creates a new course with valid details (title, description, etc.).
- Expected Output:
  The course is successfully created and can be accessed by students.

Test Case 6: Enroll in a Course

- Input:
  A student enrolls in a course.
- Expected Output:
  The student's enrollment in the course is confirmed, and access is granted.

Test Case 7: Create course Lesson

- Input:
  Instructor sets course Lesson.
- Expected Output:
  Course Lesson are correctly displayed to students.

Test Case 8: Course Price Calculation

- Input:
  Instructor sets course pricing, including discounts.
- Expected Output:
  The course price is calculated accurately for students.

Security Test (Data Protection):

Test Case 9: Data Encryption

- Input:
  Transmit user data.
- Expected Output:
  User data is properly encrypted and protected during transmission.

Test Case 10: Authentication Timeout

- Input:
  A user session times out.
- Expected Output:

The system logs the user out after a defined period of inactivity.

Test Case 11: Unauthorized Access

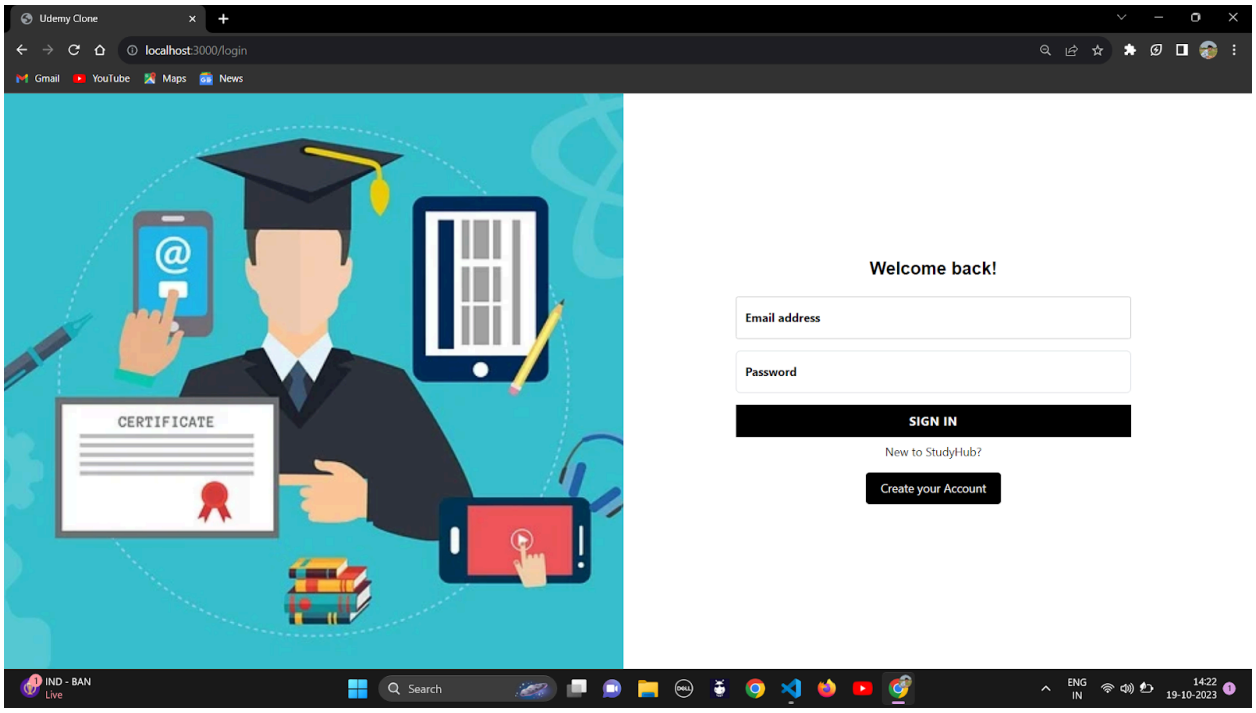
- Input:

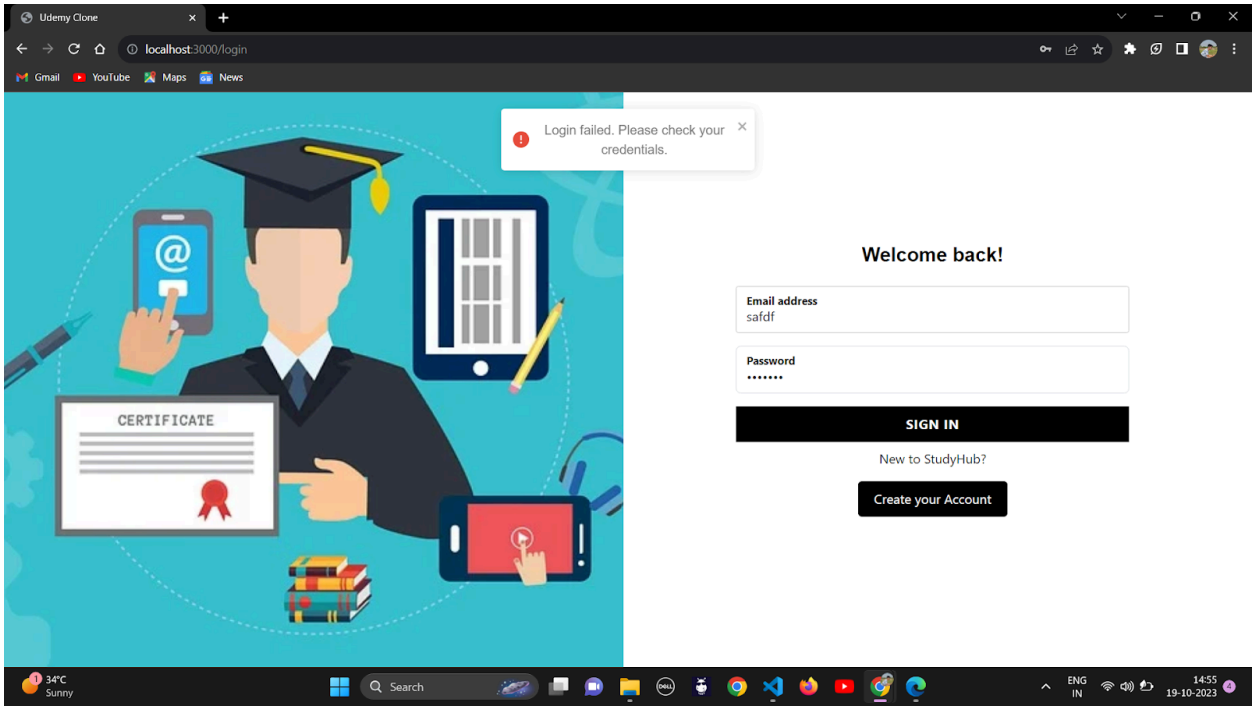
  Attempt to access the system without proper authentication.
- Expected Output:

  Unauthorized access is denied, ensuring system security.

Screen-Shots

Student site:

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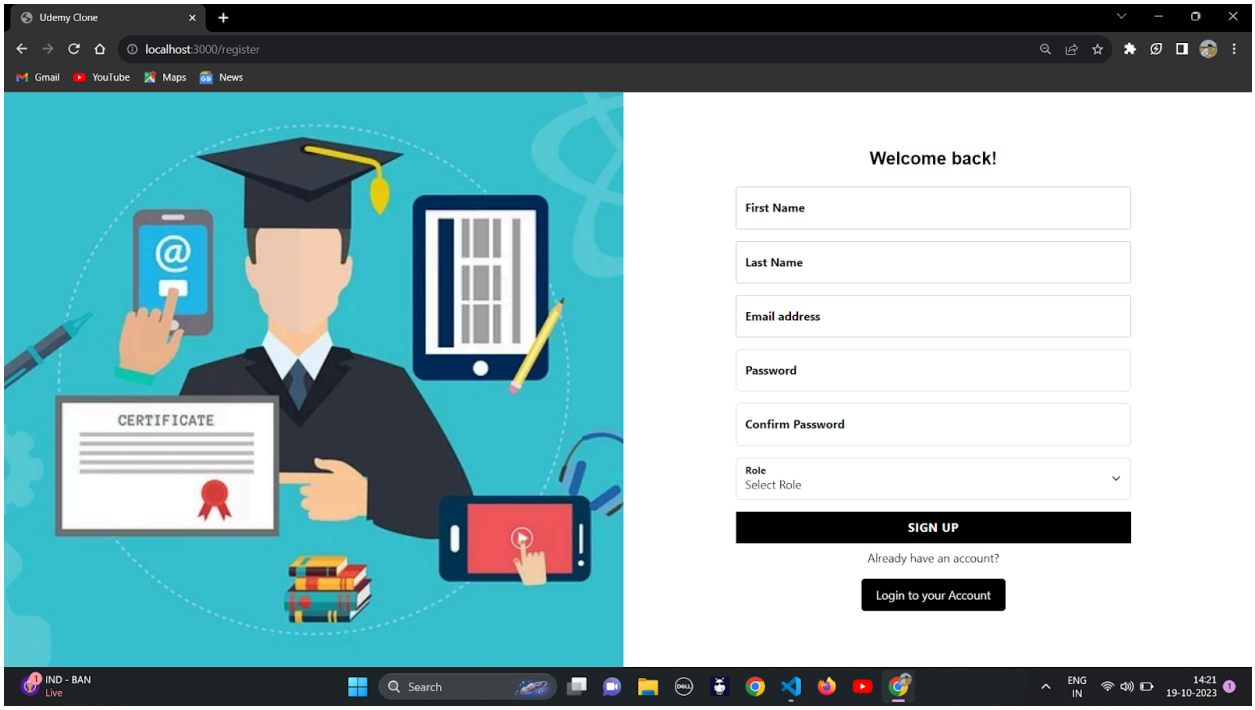
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Welcome back!
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Select Role
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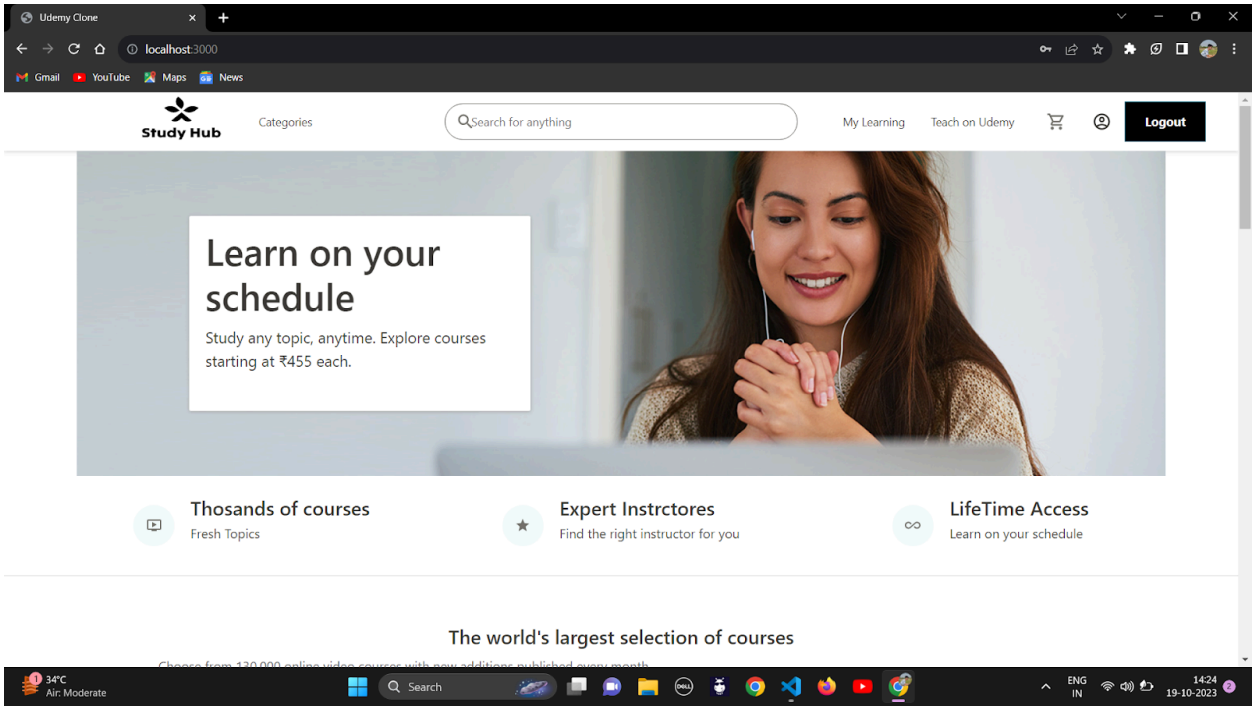
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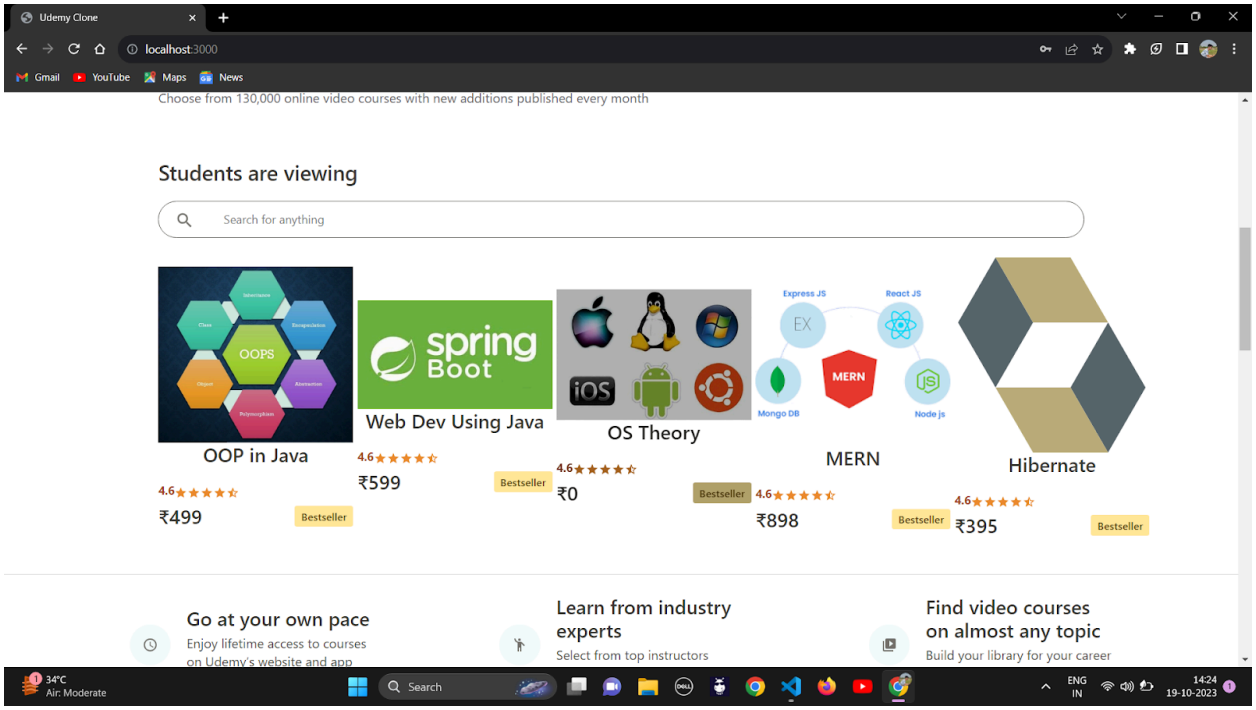
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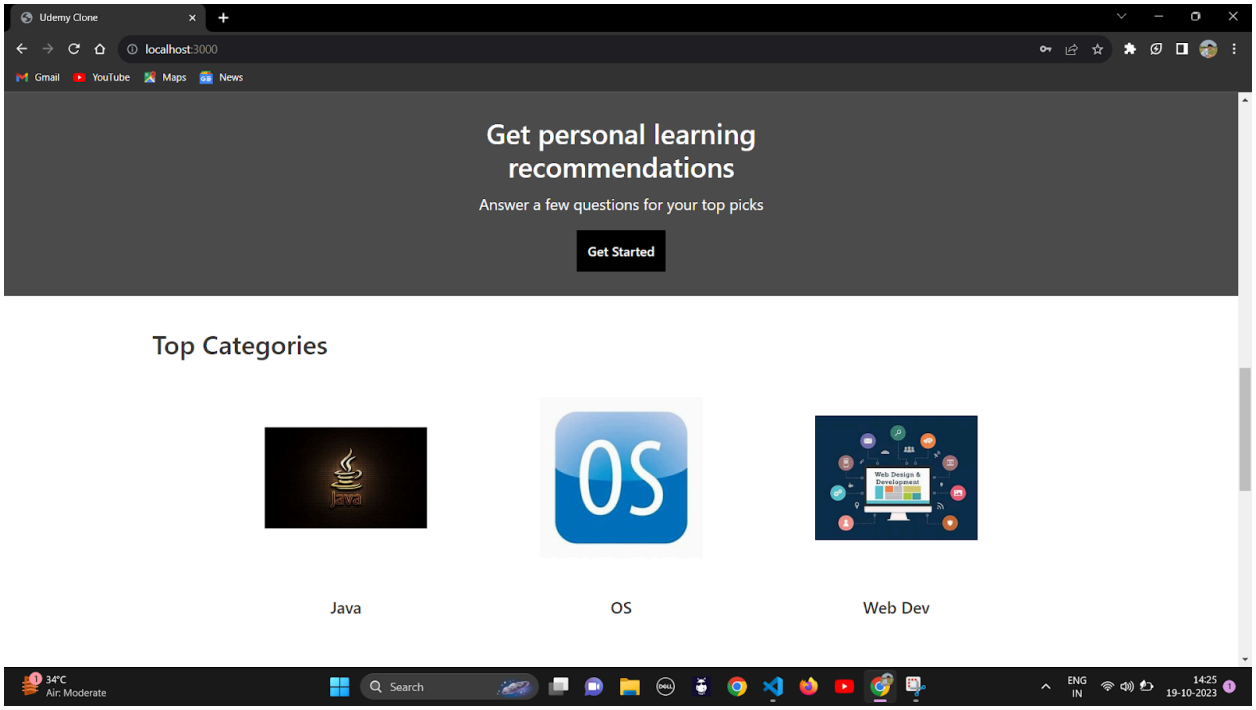
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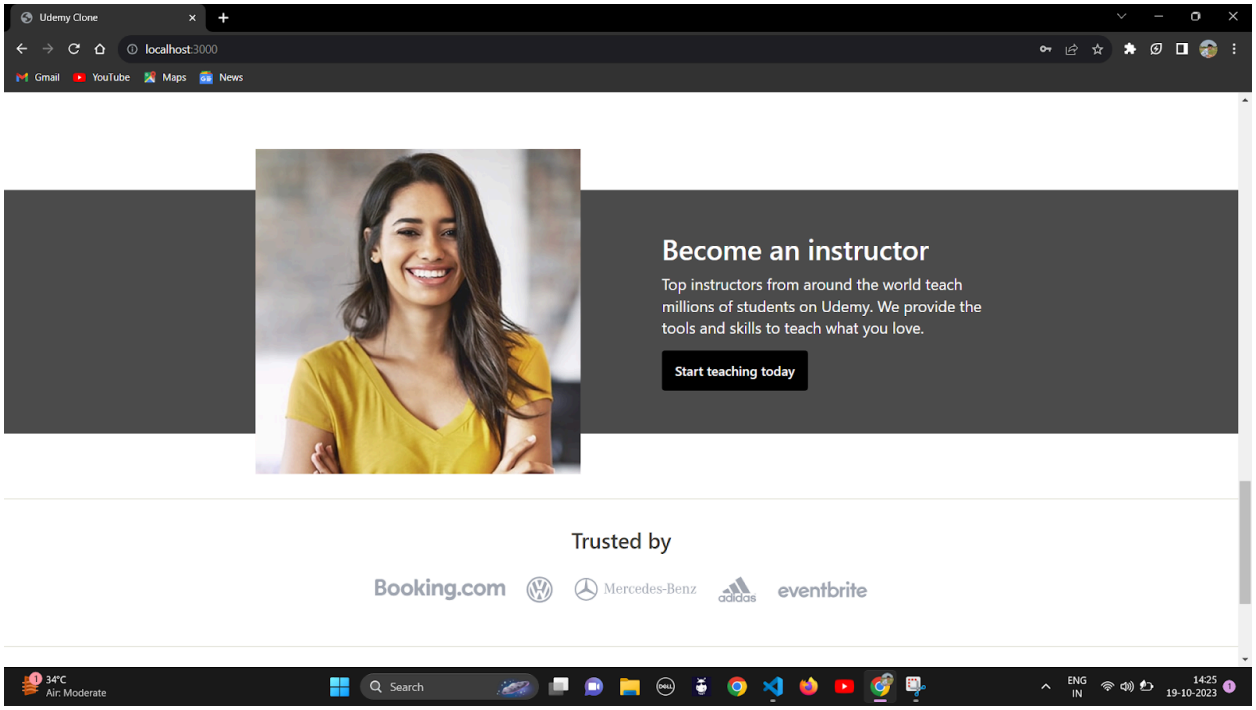
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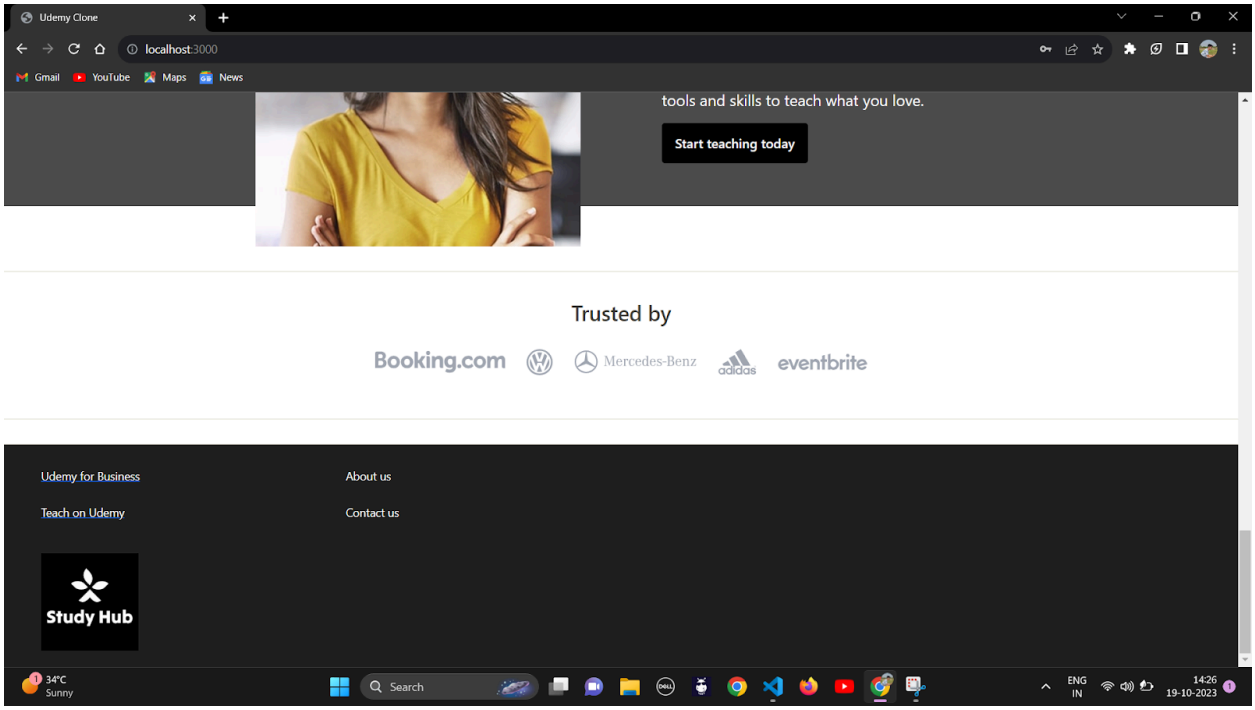
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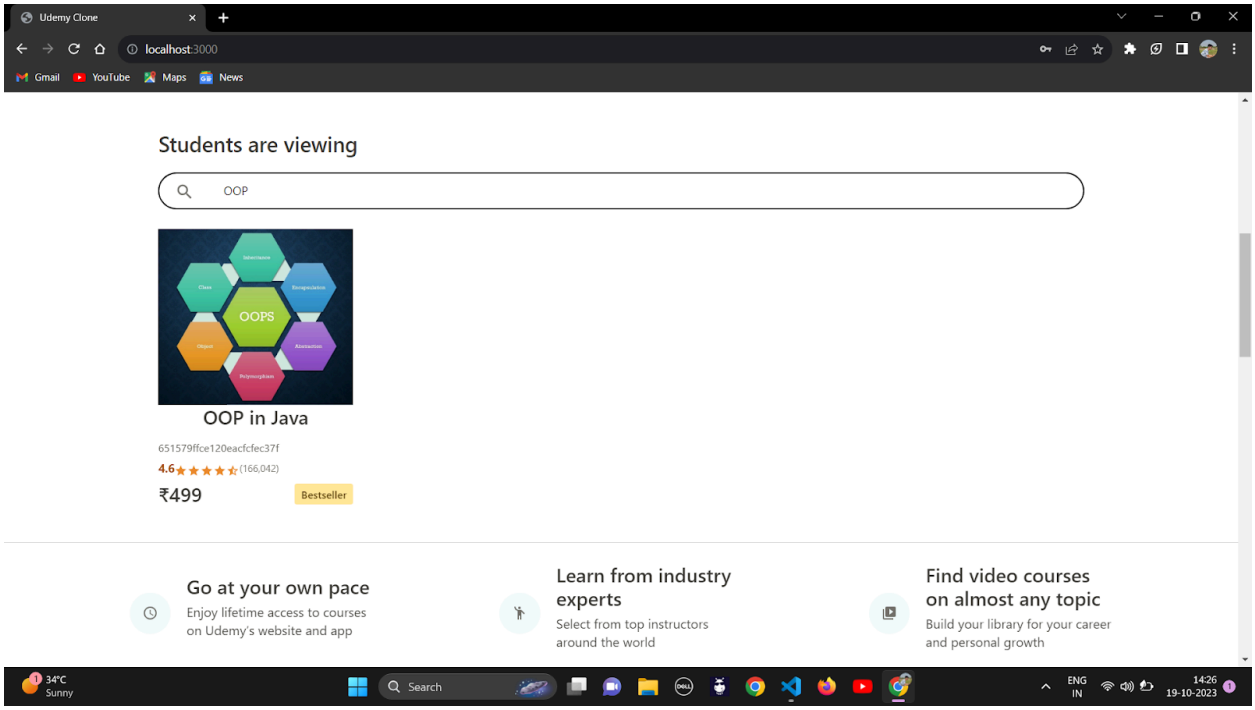
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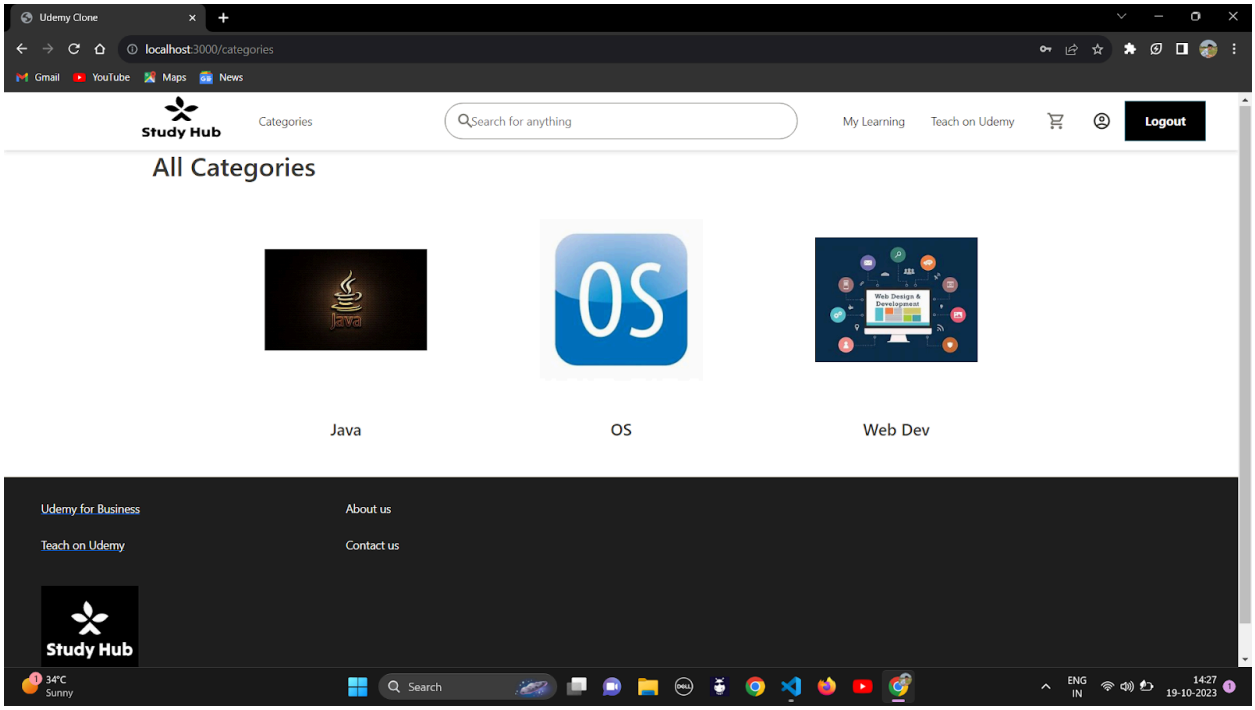
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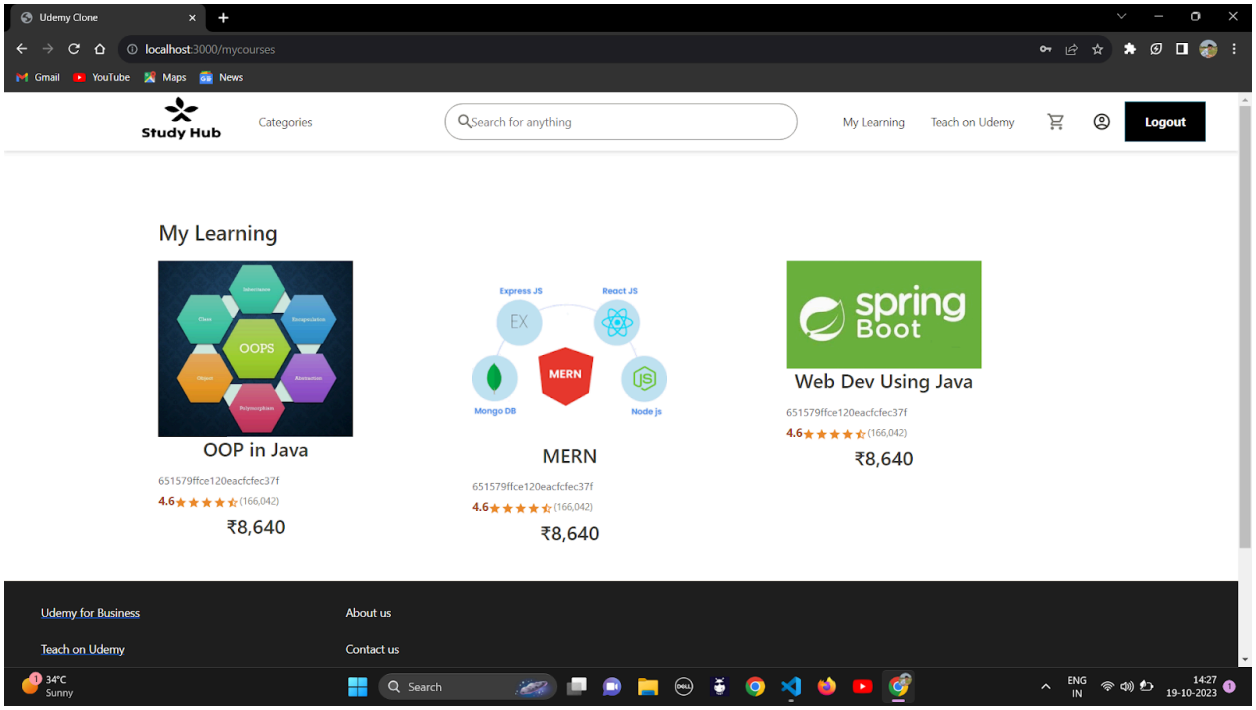
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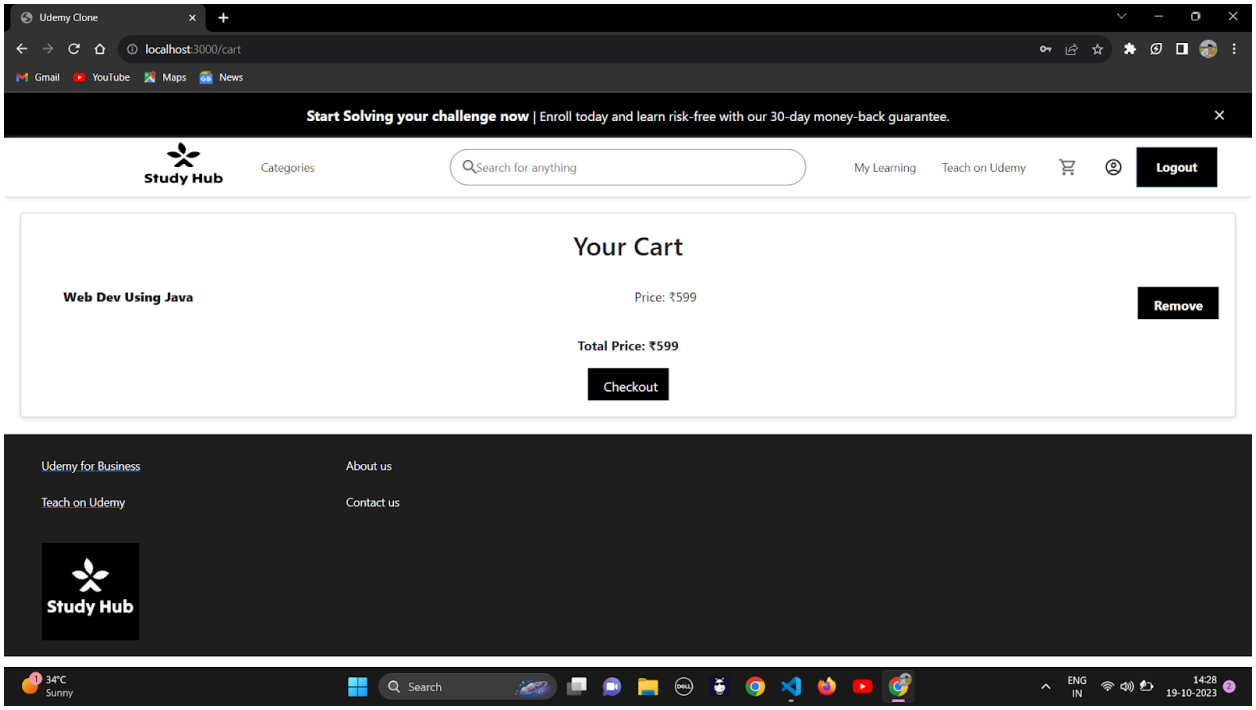
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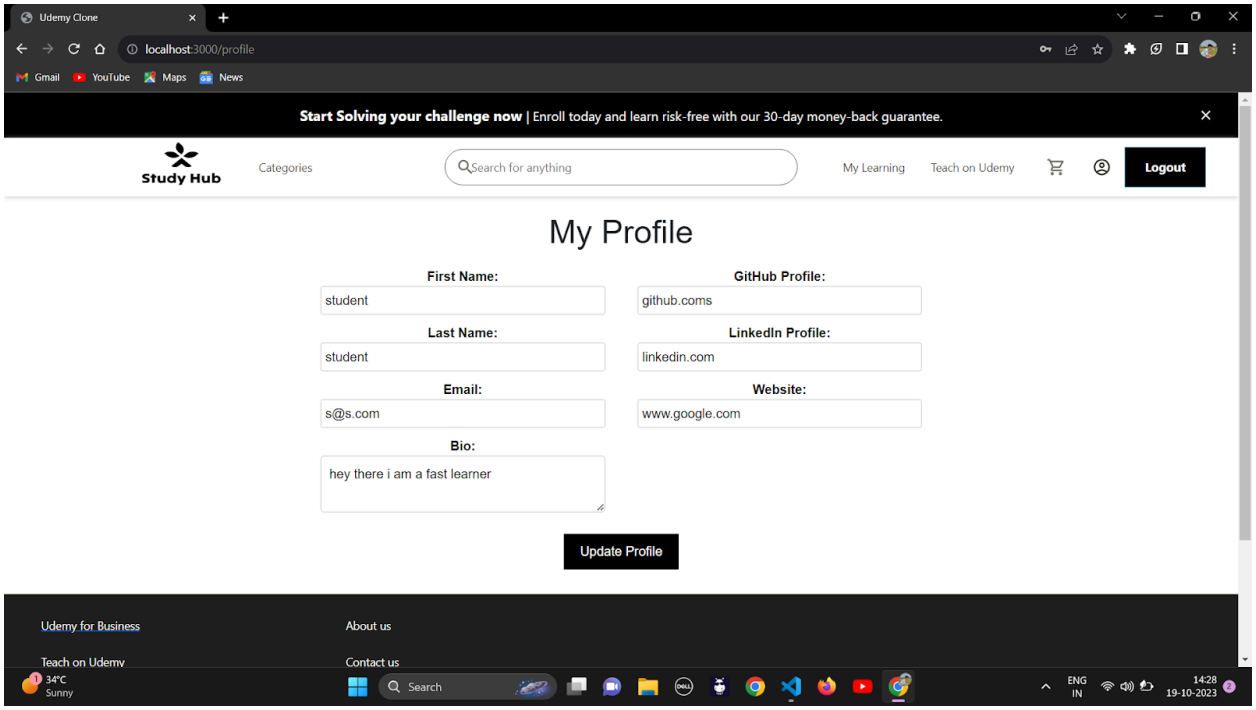
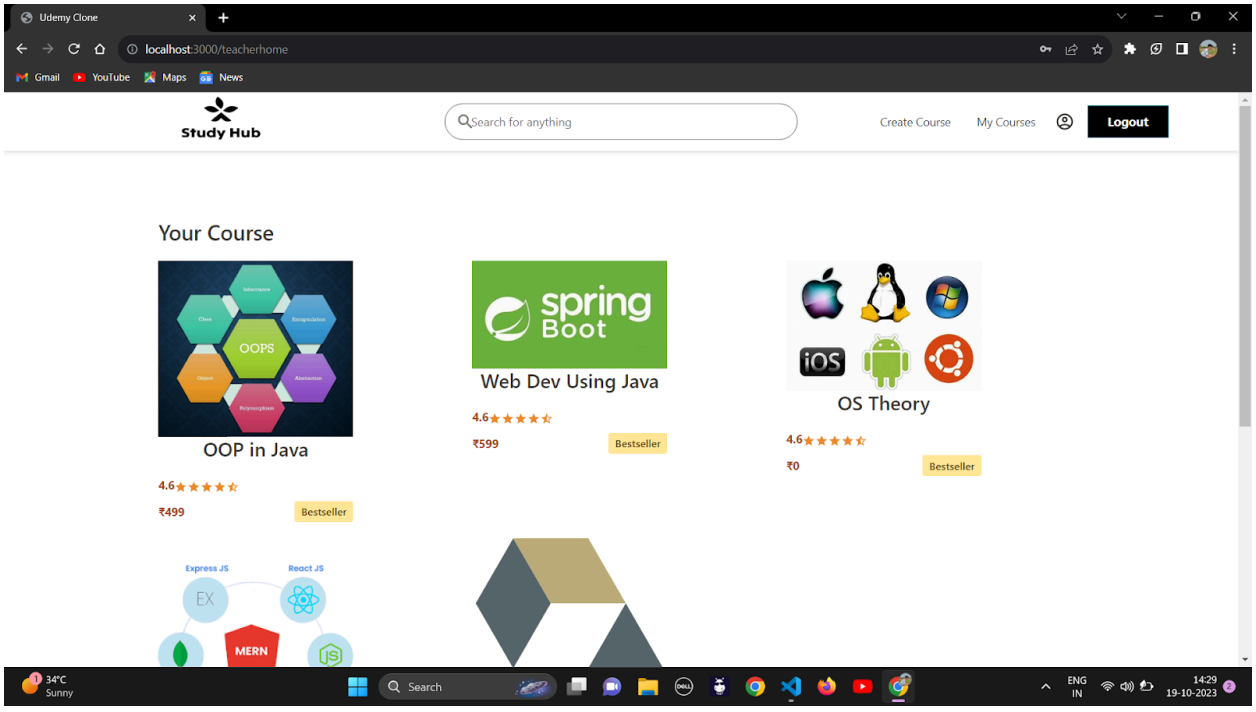
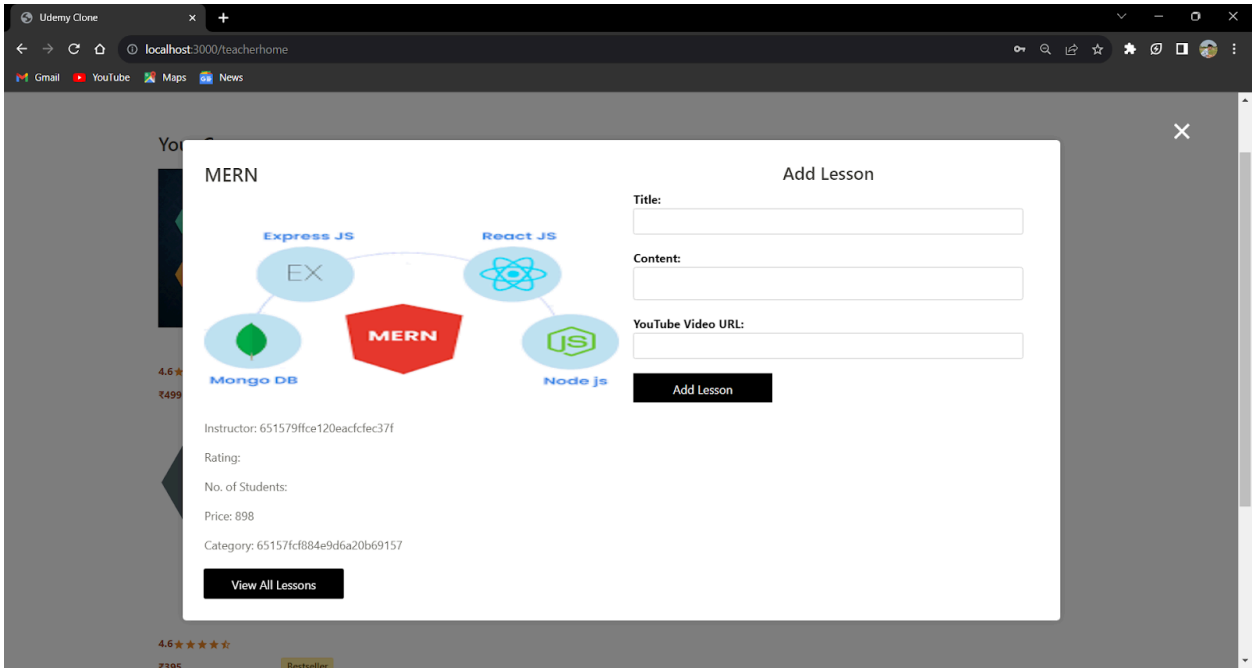


Teacher site:

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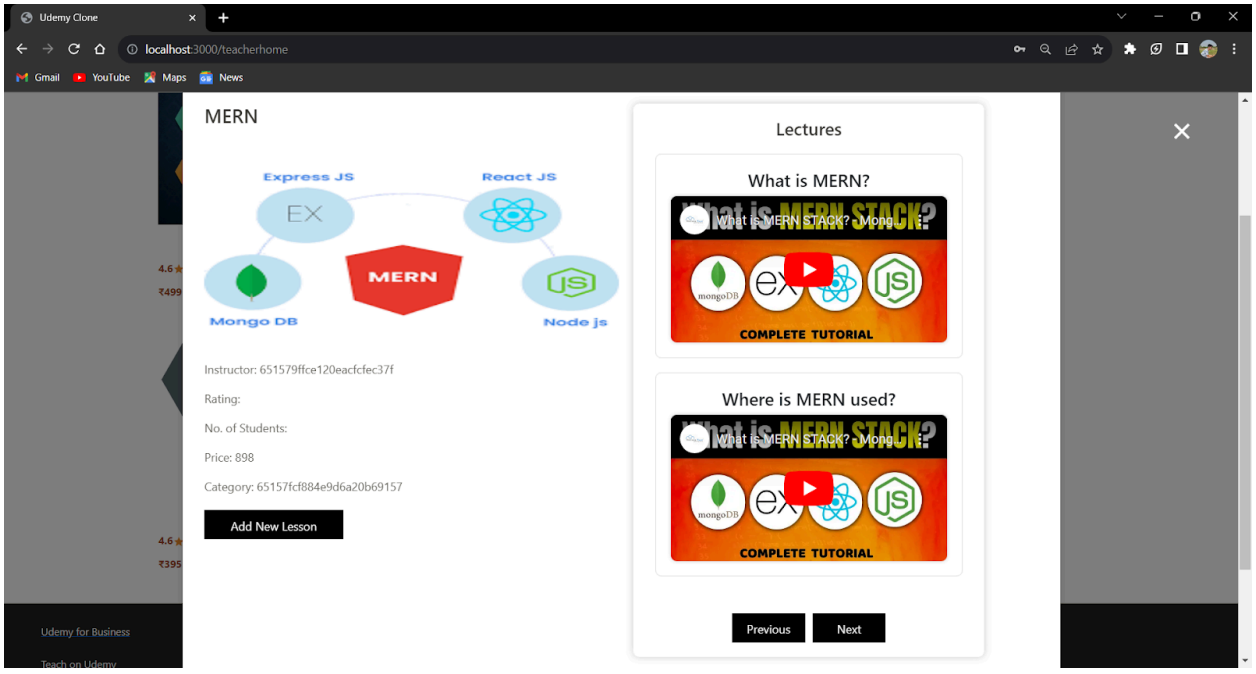
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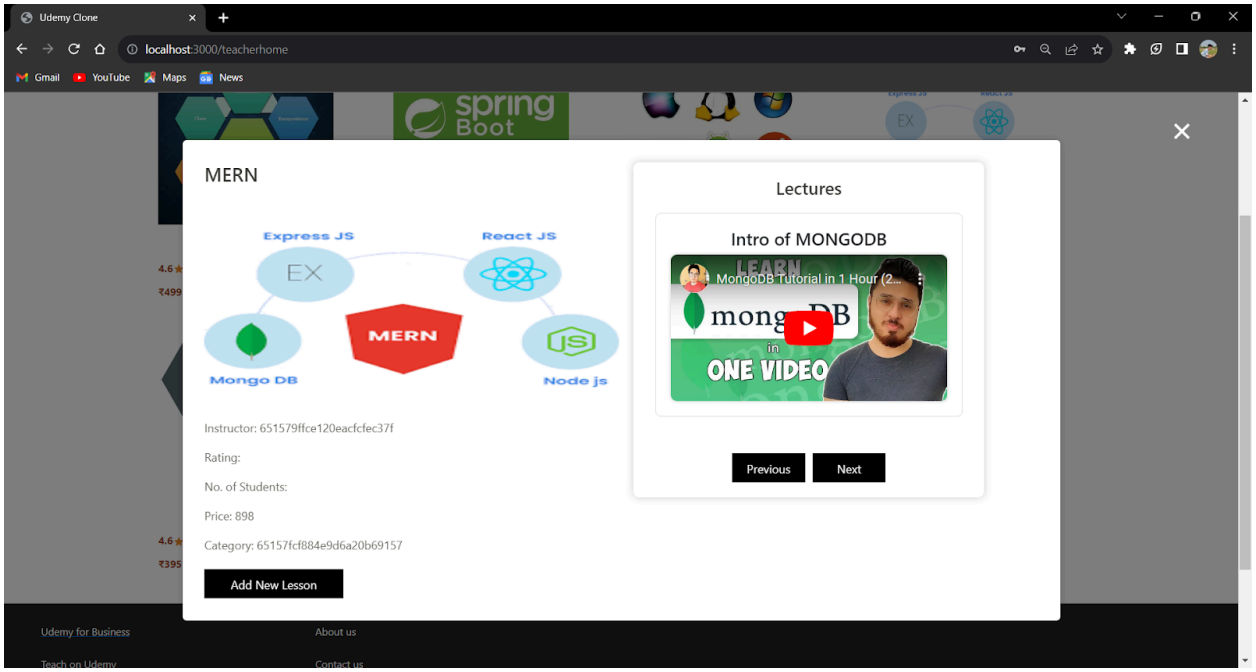
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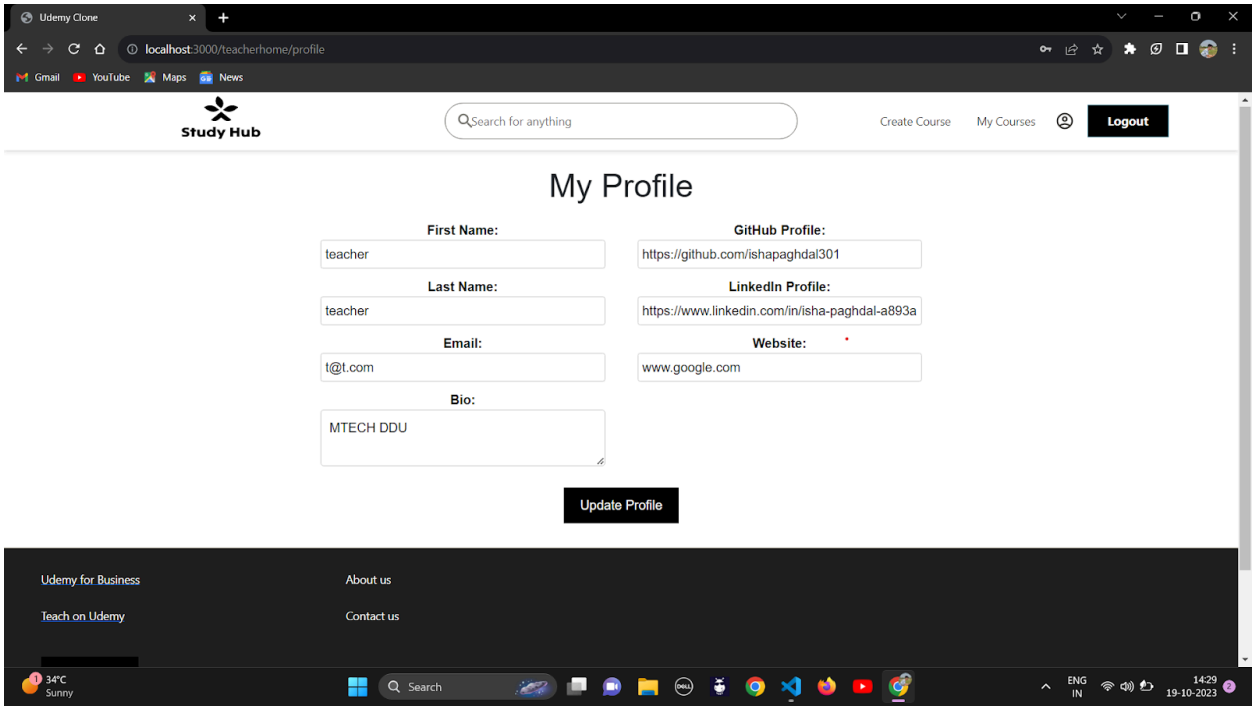
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Conclusion

The StudyHub project has successfully achieved its primary objectives, creating a user-friendly platform for both instructors and students. Instructors can easily create and manage courses, while students can seamlessly browse, enroll, and purchase courses. This system facilitates online learning and offers a convenient educational experience.

Limitation and Future Extension

In tudyHub we have not used our own video player , we are using youtube player to play the video which is provided by the instructor and instructor is also not able to upload the video from local storage. This is yet to be implemented.

Bibliography

MongoDB Official Documentation - Documentation on MongoDB, including installation, configuration, and usage: https://docs.mongodb.com

React Official Documentation - Comprehensive documentation on React: https://reactjs.org

Node.js Official Documentation - The official documentation for Node.js, including APIs and guides: https://nodejs.org