

PROJECT TITLE

# Learning Management System with Machine Learning Course Recommendation



MAJOR PROJECT EVEN SEMESTER 2023-24

Presented by:

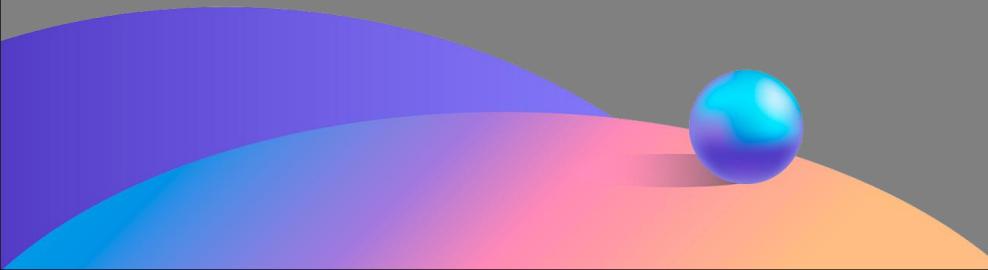
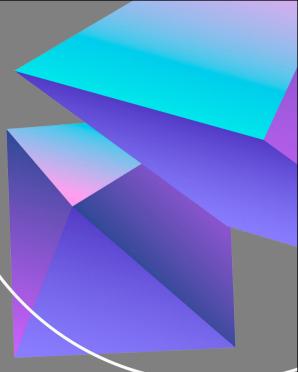
Ravi Prakash - 20102134

Mohammed Fayez Khan - 20102148

Under the Supervision of:

Dr. Jasmine Saini

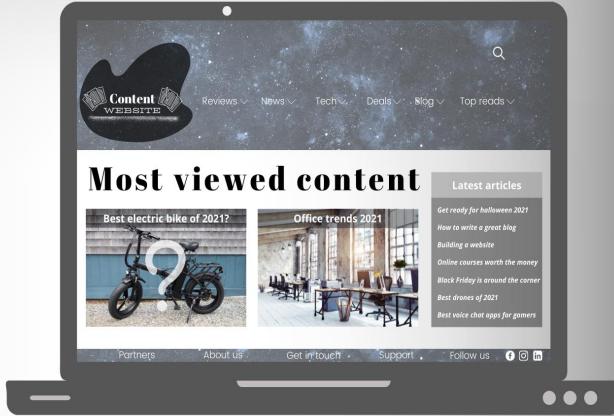
# Learning Management System with Machine Learning Course Recommendation



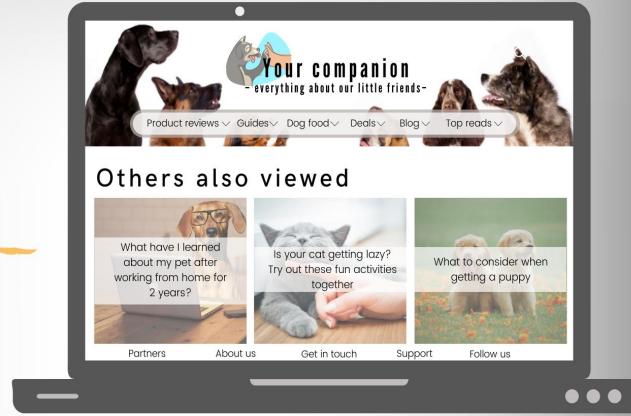
# CONTENTS

- Introduction to the Project
- Stacks Used
- Flow Chart
- Model Implementation
- Machine Learning Implementation
- Future Scope
- References

## Most viewed content



## Others also viewed



## Similar content



## Most viewed content in a category



# INTRODUCTION TO THE PROJECT



In the realm of online education, our college project aspires to make a meaningful impact by creating an advanced **Learning Management System (LMS)** equipped with a machine learning-based course recommendation system. At its core, our project aims to deliver a tailored learning experience that adapts to each user's unique needs and goals.

- Frontend interface for users to interact with the platform: a user-friendly search bar, course listings, and sections dedicated to displaying personalized recommendations.
- Content-based filtering: to analyze course metadata and provide personalized recommendations.

## Goals:

- Personalized Learning
- User-Friendly Interface
- Efficient Specialized functionalities

## Key Components:

- Course Recommendation
- Personalized Course Recommendation
- Book Recommendation
- Simple MCQ Generator
- Text Summarizer

# STACKS USED

01.

**Frontend Excellence**

**HTML & CSS**

02.

**Machine Learning**

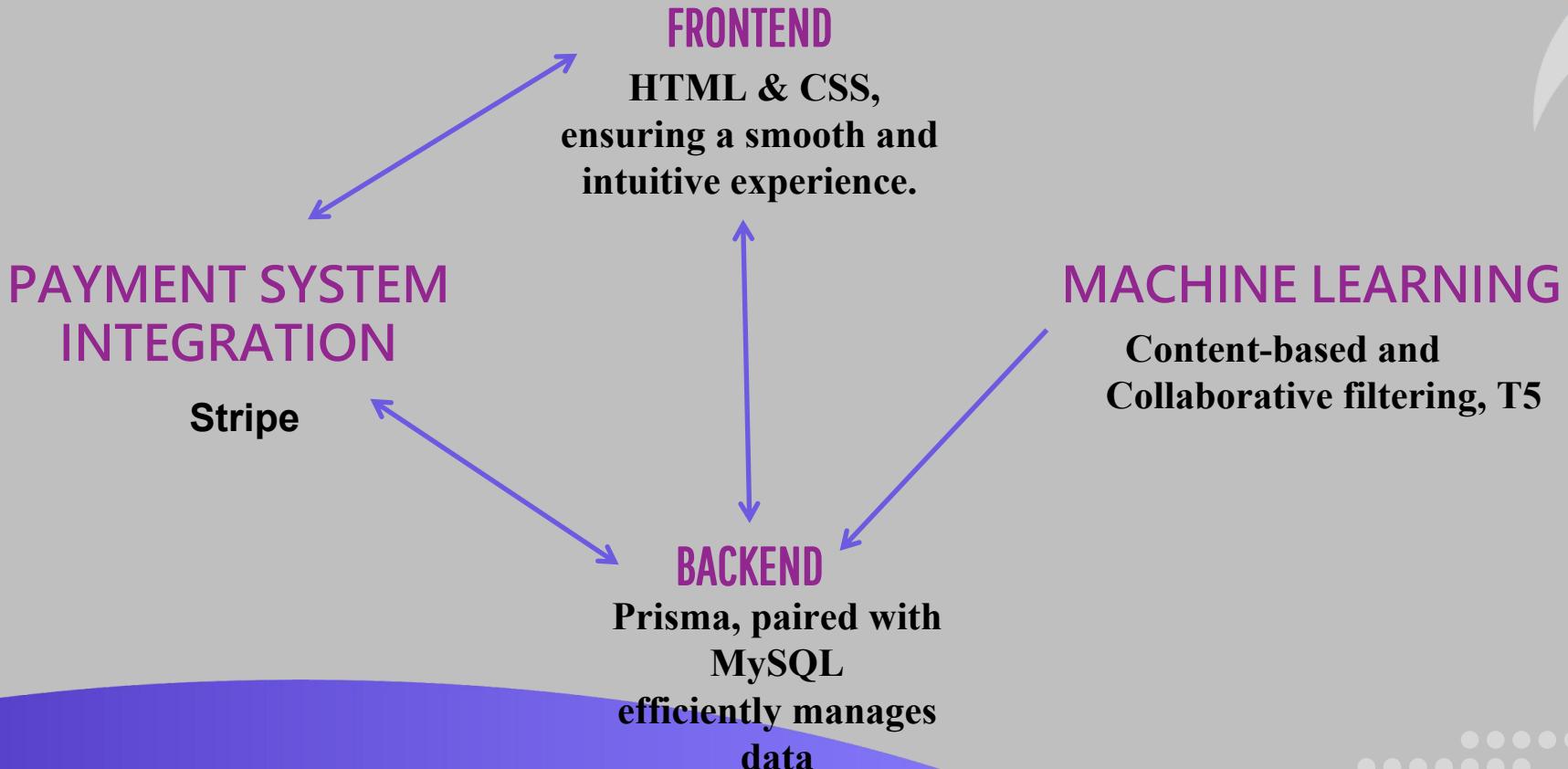
**Collaborative and  
Content-based filtering  
and T5**

03.

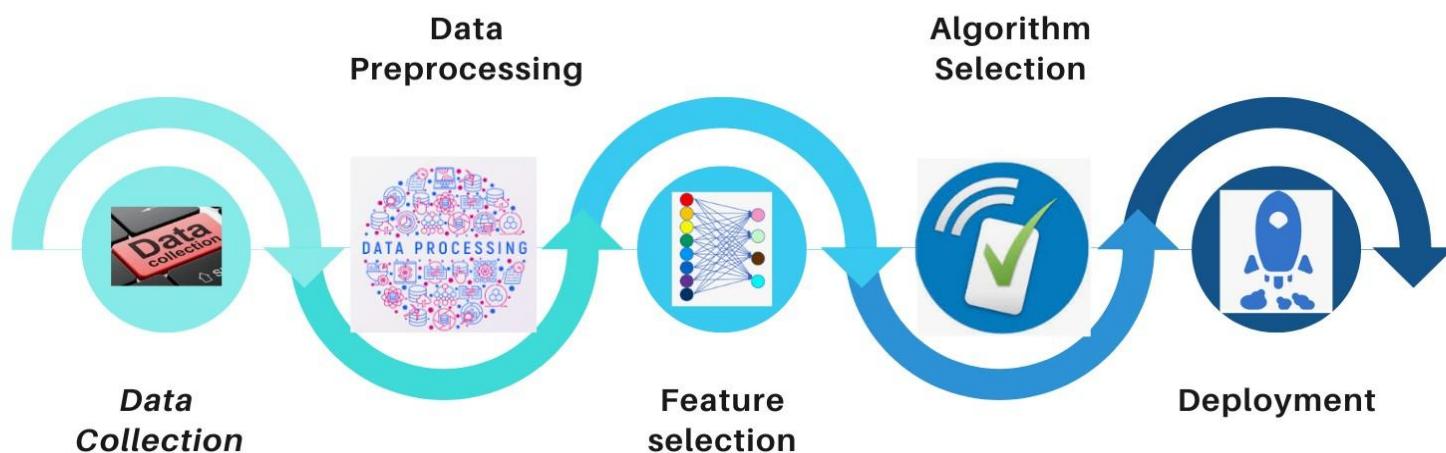
**Data Dominance**

**Prisma, paired with  
MySQL**

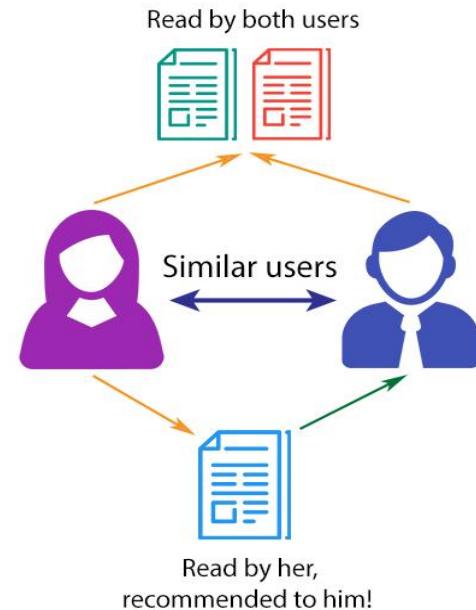
# FLOW CHART



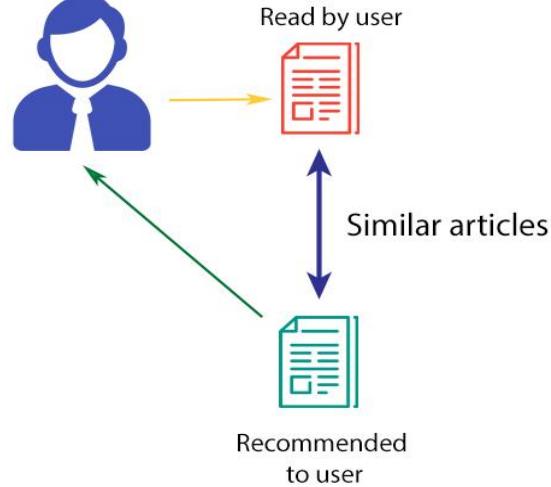
# MACHINE LEARNING IMPLEMENTATION



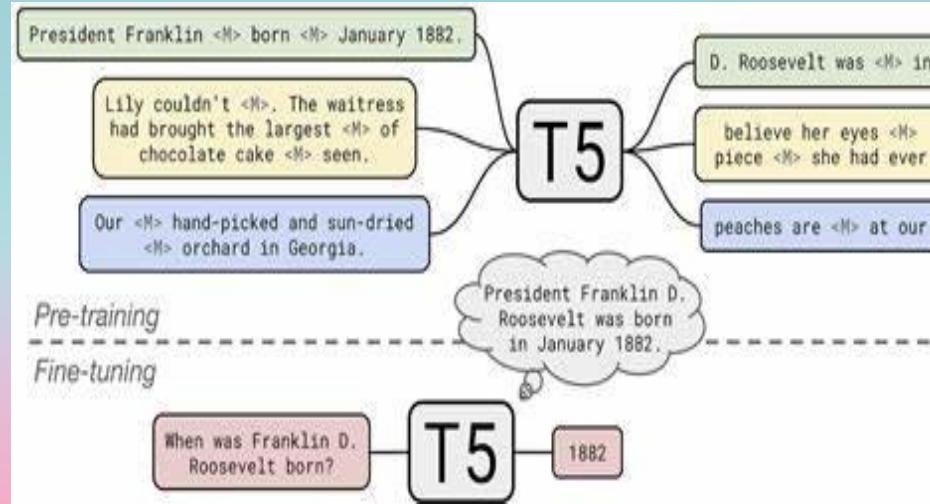
## COLLABORATIVE FILTERING



## CONTENT-BASED FILTERING



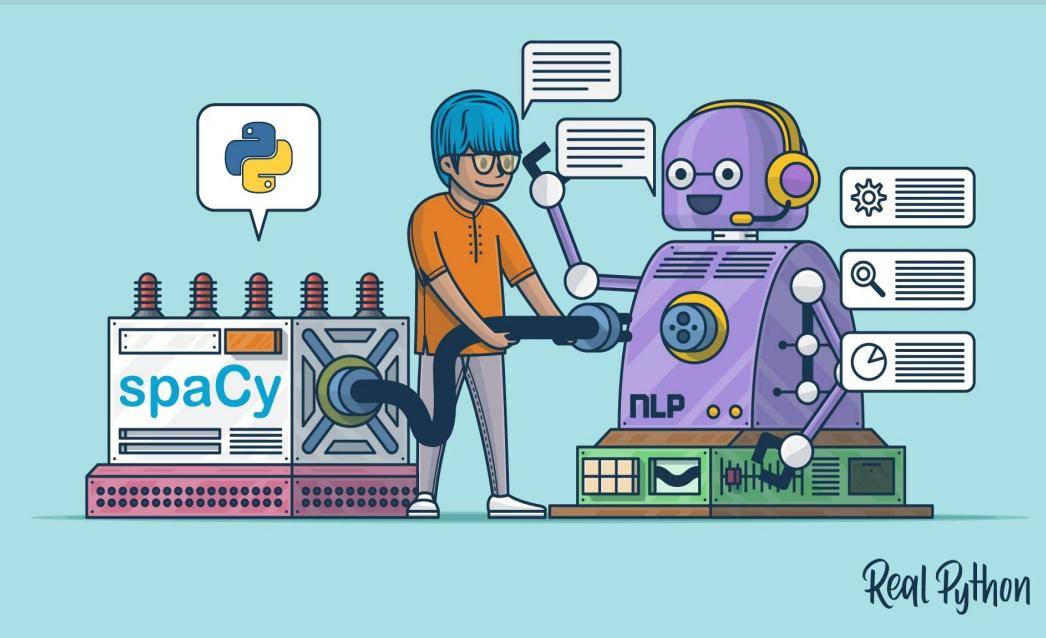
# LLM and T5 model



Why do we use it here?

For Text Summarization

# NLP and SPACY



# Why use SPACY for MCQ Generation

For Text Summarization

## Features:

- Text Preprocessing
- Named Entity Recognition (NER)
- Part-of-Speech (POS) Tagging
- Dependency Parsing

## FLASK - USED AS THE BACKEND OF THE PROJECT



**FLASK - BACKEND COM  
PYTHON**

- Simplicity and Flexibility
- Integration with Machine Learning Models
- Routing
- Request Handling

# FILE STRUCTURE

A screenshot of a Windows File Explorer window titled "lms\_latest\_final". The window shows a list of files and folders within the directory. The columns are "Name", "Date modified", "Type", and "Size". The "Name" column is sorted in ascending order. The "Type" column includes "File folder" for most items and "XLS Worksheet" for several Excel files. The "Size" column shows file sizes such as 218 KB, 109 KB, 127 KB, 231 KB, 5 KB, 71,576 KB, 19 KB, 1 KB, and 730 KB.

Name	Date modified	Type	Size
.idea	5/22/2024 7:42 AM	File folder	
__pycache__	5/22/2024 7:42 AM	File folder	
images	5/22/2024 9:17 AM	File folder	
js	5/22/2024 7:42 AM	File folder	
pages	5/22/2024 7:42 AM	File folder	
static	5/22/2024 7:42 AM	File folder	
templates	5/22/2024 7:42 AM	File folder	
3.1-data-sheet-udemy-courses-business-...	2/28/2024 7:50 PM	XLS Worksheet	218 KB
3.1-data-sheet-udemy-courses-design-c...	2/28/2024 7:50 PM	XLS Worksheet	109 KB
3.1-data-sheet-udemy-courses-music-co...	2/28/2024 7:50 PM	XLS Worksheet	127 KB
3.1-data-sheet-udemy-courses-web-dev...	2/28/2024 7:50 PM	XLS Worksheet	231 KB
app	3/14/2024 3:51 AM	Python Source File	5 KB
Books	2/9/2024 11:14 AM	XLS Worksheet	71,576 KB
business	3/7/2024 1:37 AM	JSON Source File	19 KB
courser1	2/22/2024 12:06 PM	XLS Worksheet	1 KB
courser2	2/22/2024 12:06 PM	XLS Worksheet	1 KB
courser3	2/22/2024 12:07 PM	XLS Worksheet	1 KB
Entry Level Project Sheet - 3.1-data-sheet...	2/28/2024 7:50 PM	XLS Worksheet	730 KB
multimedia	3/7/2024 1:44 AM	JSON Source File	15 KB

lms_latest_final				
Documents > lms_latest_final >				
Search lms_latest_final				
	Name	Date modified	Type	Size
Home				
Gallery	3.1-data-sheet-udemy-courses-music-co...	2/28/2024 7:50 PM	XLS Worksheet	127 KB
> ravi - Personal	3.1-data-sheet-udemy-courses-web-dev...	2/28/2024 7:50 PM	XLS Worksheet	231 KB
	app	3/14/2024 3:51 AM	Python Source File	5 KB
Desktop	Books	2/9/2024 11:14 AM	XLS Worksheet	71,576 KB
Downloads	business	3/7/2024 1:37 AM	JSON Source File	19 KB
Documents	courser1	2/22/2024 12:06 PM	XLS Worksheet	1 KB
Pictures	courser2	2/22/2024 12:06 PM	XLS Worksheet	1 KB
courserecomm	courser3	2/22/2024 12:07 PM	XLS Worksheet	1 KB
Music	Entry Level Project Sheet - 3.1-data-sheet...	2/28/2024 7:50 PM	XLS Worksheet	730 KB
Videos	multimedia	3/7/2024 1:44 AM	JSON Source File	15 KB
Screenshots	music	3/7/2024 1:47 AM	JSON Source File	5 KB
MCQ_Generator-m...	Procfile	5/28/2022 8:42 AM	File	1 KB
resume-compresso...	Ratings	2/9/2024 11:14 AM	XLS Worksheet	22,104 KB
jasmine mam_repo	recommendbook	3/7/2024 4:45 AM	Python Source File	3 KB
	requirements	5/28/2022 8:42 AM	Text Document	1 KB
> This PC	testcourse	3/7/2024 2:57 AM	Python Source File	4 KB
> Local Disk (C)	testqa	3/15/2024 3:09 PM	Python Source File	4 KB
> Network	Users	2/9/2024 11:14 AM	XLS Worksheet	10,760 KB
	web	3/7/2024 1:51 AM	JSON Source File	14 KB

# The Landing Page of LMS Website



Career's Way Right

Login

Dashboard | Leader board | Mentorship | Newsletter

Skill Test

All

Machine Learning

Deep Learning

Web Development

Electronics

Computer Science

Practice

IT

Biotechnology

C++

B.Tech

UPSC

Civil Services

Get Course Recommendation

Search courses...

Filter

Get Books Recommendation

Suggest Career Path

Get Counselling

Practice

Help Centre

Subscribe

About Us



HTML

A to Z of HTML

Enroll Now



ML

A to Z of ML

Enroll Now



Deep Learning

A to Z of Deep Learning

Enroll Now



# Login Authentication

**Login as**

Client

**Username**

Enter Username

**Password**

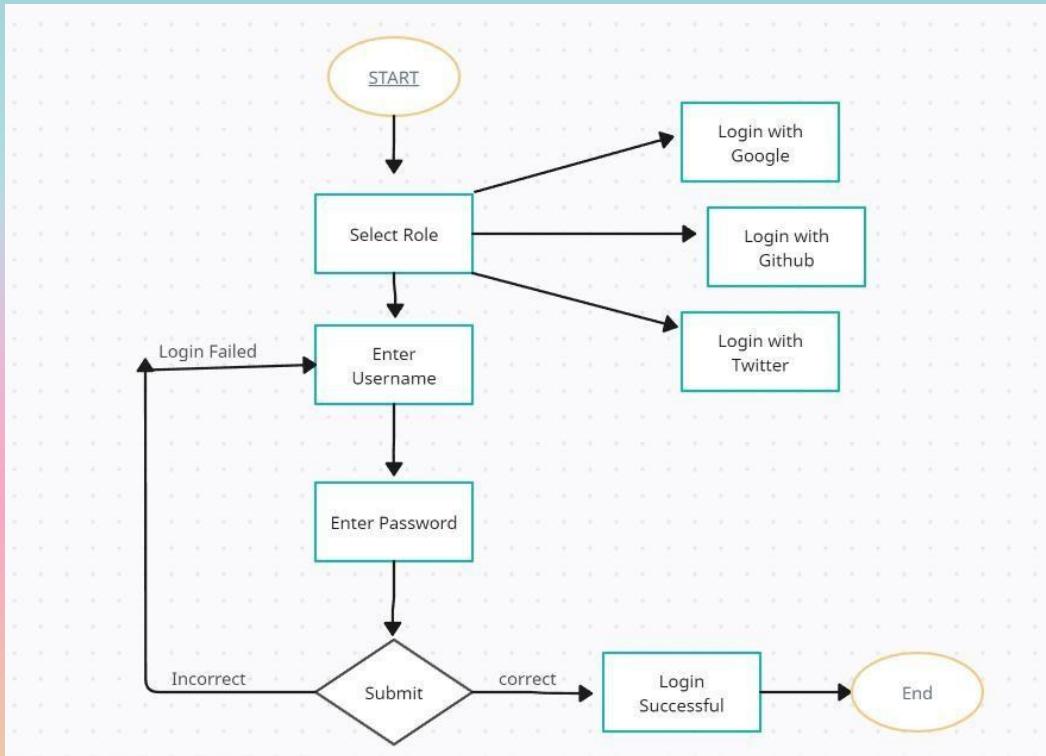
Enter Password

**Login**

**Authentication Provider: Firebase**

# Workflow @LoginAuth



# Skill Test

## Multimedia Skill Assessment

1. What is the primary function of the 'Layers' panel in graphic design software?

Adjusting color balance

Organizing and managing different elements in a design

Applying filters

Changing canvas size

2. What does the term 'Frame Rate' refer to in video editing?

The size of the video frame

The number of pixels in a frame

The speed at which frames are displayed per second

The duration of a video

3. Which tool in Photoshop is used for removing the background from an image?

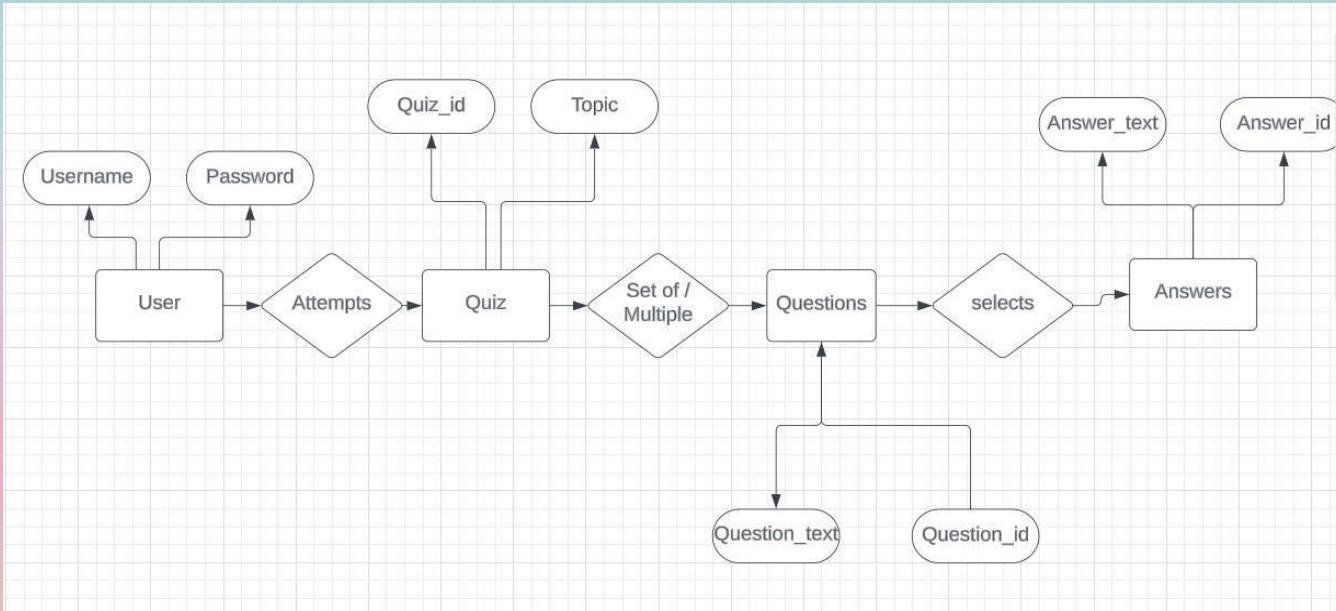
Eraser Tool

Magic Wand Tool

Pen Tool

Background Eraser Tool

# Practice Page



# LogoCareer's Way Right

Dashboard | Leader board | Mentorship | Newsletter

All Machine Learning Deep Learning Web Development Electronics Computer Science

IT Biotechnology C++ B.Tech UPSC Civil Services

Search courses... Filter

**HTML**  
A to Z of HTML  
[Enroll Now](#)

**ML**  
A to Z of ML  
[Enroll Now](#)

**Deep Learning**  
A to Z of Deep Learning  
[Enroll Now](#)

**Web Development**  
A to Z of Web Development  
[Enroll Now](#)

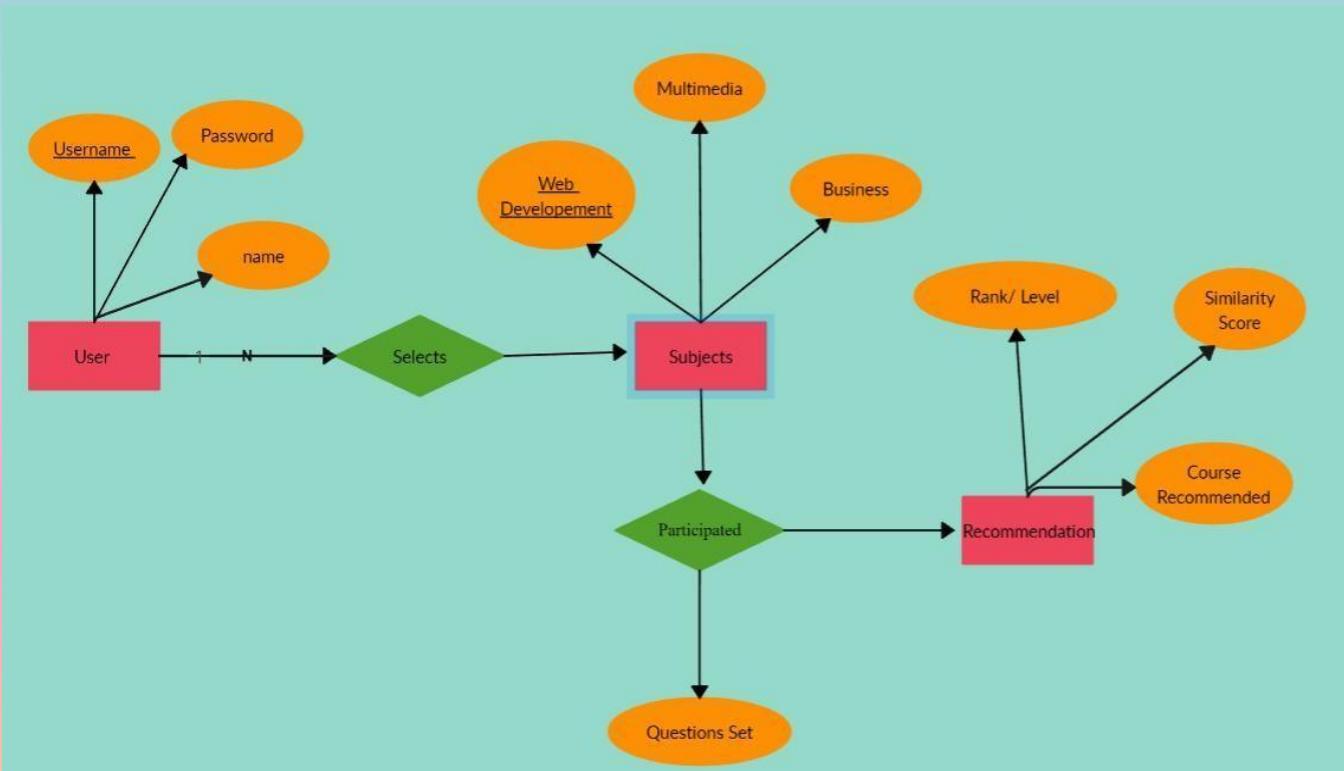
**Satellite Communication**  
SAT COMM.

**Analog Electronics**  
Learn Analog Electronics

**Astrophysics**  
Learn Astrophysics

**Network Security**  
Learn Network Security

# ER Diagram @Course Recommendation





**LogoCareer's Way Right**

Dashboard | Leader board | Mentorship | Newsletter

All Machine Learning Deep Learning Web Development Electronics Computer Science

IT Biotechnology C++ B.Tech UPSC Civil Services

Search courses... Filter

**HTML**  
A to Z of HTML  
[Enroll Now](#)

**ML**  
A to Z of ML  
[Enroll Now](#)

**Deep Learning**  
A to Z of Deep Learning  
[Enroll Now](#)

**Web Development**  
A to Z of Web Development  
[Enroll Now](#)

**Satellite Communication**  
SAT COMM.

**Analog Electronics**  
Learn Analog Electronics

**Astrophysics**  
Learn Astrophysics

**Network Security**  
Learn Network Security

# Course Recommendation

## Recommended Courses for 'html'



Get to know HTML Learn HTML Basics (Web Development)

Level: Beginner Level

Similarity Score:

0.7266952372927017

URL:

<https://www.udemy.com/html-online-course/>

Price: 200.0

Subscribers: 10674.0



HTML : HTML Awesomeness (Web Development)

Level: All Levels

Similarity Score:

0.716910339370177

URL:

<https://www.udemy.com/html-awesomeness/>

Price: 25.0

Subscribers: 988.0



HTML Tutorial: HTML & CSS for Beginners (Subject: Web Development)

Level: Beginner Level

Similarity Score:

0.7149153174397719

URL:

<https://www.udemy.com/learn-html5/>

Price: 20.0

Subscribers: 12458.0



HTML for Beginners (Web Development)

Level: Beginner Level

Similarity Score:

0.6990177228977891

URL:

<https://www.udemy.com/html5-training/>

Price: 0.0

Subscribers: 8592.0



HTML FOR BEGINNERS (Web



HTML Introduction Course: Learn

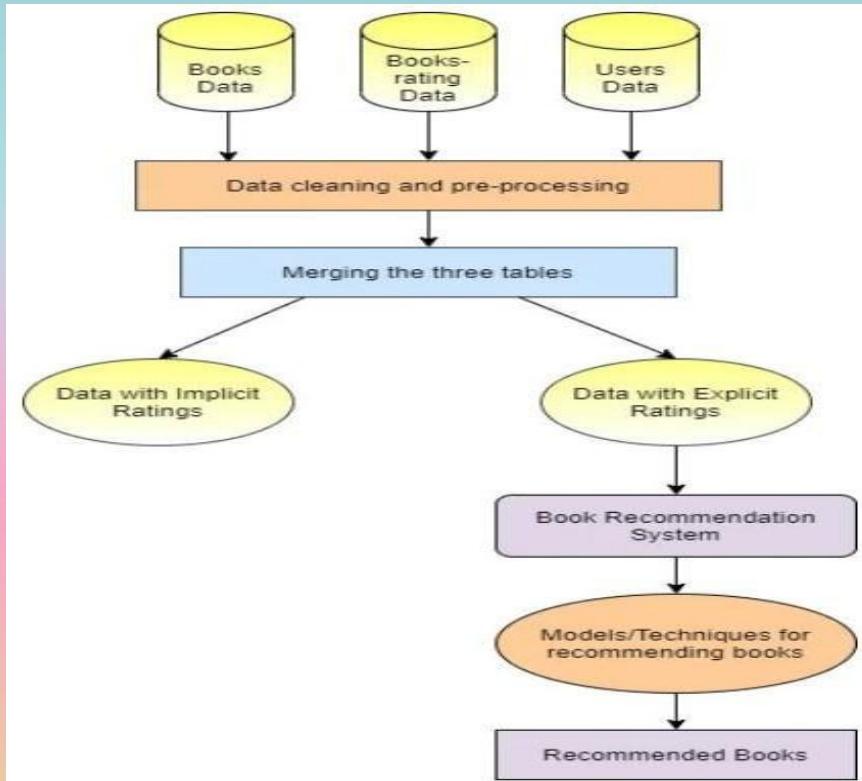


Learn HTML, A practical guide



HTML : Beginner Guide to HTML

# Work Flow @Book Recommendation



# Book Recommender

My Book Recommender

HomeRecommendContact

## RECOMMEND BOOKS

Enter a keyword...

Search

Image	Title	Author	ISBN	Number of Users	Average Rating
	The Html Sourcebook: A Complete Guide to HTML 3.0	Author: Ian S. Graham	ISBN: 0471142425	Number of Users: 2.0	Average Rating: 6.5
	HTML Complete	Author: Sybex Inc.	ISBN: 0782124674	Number of Users: 2.0	Average Rating: 2.0
	HTML 4 for Dummies	Author: Ed Tittel	ISBN: 0764503316	Number of Users: 2.0	Average Rating: 5.0
	HTML for Dummies	Author: Ed Tittel	ISBN: 076450214X	Number of Users: 3.0	Average Rating: 9.33333333333334
	More HTML for Dummies	Author: Ed Tittel	ISBN: 0764502336	Instant HTML Programmer's Reference	Using HTML
	Instant HTML Programmer's Reference	Author: Alex Homer	ISBN: 0789702363	HTML 4.0 Edition	Author: Tom Savola
	Special Edition Using HTML				

# TEXT TO MCQ GENERATION

The screenshot shows a Jupyter Notebook interface with the title "Question-MCQs-Generator-Using-Machine-learning-NLP-main". The left sidebar displays a file tree under "QUESTION-MCQS-GEN...". The main area contains the following Python code:

```
tech_text = """
The universe is vast and filled with mysteries that continue to captivate scientists and astronomers alike. From the depths of space to the farthest reaches of
one of the fundamental concepts in astrophysics is the Big Bang theory, which posits that the universe originated from a singular, infinitely dense point nearl
Galaxies are immense systems containing billions or even trillions of stars, as well as various types of interstellar matter such as gas, dust, and dark matter
Stars are the celestial objects that shine brightly in the night sky, fueled by nuclear fusion reactions occurring in their cores. They come in a variety of si
Planets orbit stars and come in different types, including terrestrial planets like Earth, gas giants like Jupiter, and icy worlds like Neptune. In our solar s
Space exploration has allowed humanity to venture beyond Earth and explore the cosmos firsthand. Missions to the Moon, Mars, and beyond have expanded our under
The search for extraterrestrial life is a central focus of space exploration, driven by the desire to uncover whether life exists beyond Earth. Scientists stud
The study of black holes, mysterious regions of spacetime where gravity is so strong that nothing, not even light, can escape, is another area of active resear
Cosmology, the scientific study of the origin, evolution, and eventual fate of the universe, seeks to answer some of the most profound questions about our exist

"""
mcqs = generate_mcqs(tech_text, num_questions=10) # Pass the selected number of questions
# Ensure each MCQ is formatted correctly as (question_stem, answer_choices, correct_answer)
mcqs_with_index = [(i + 1, mcq) for i, mcq in enumerate(mcqs)]

for question in mcqs_with_index:
    print("Question", question[0], ":", question[1][0])
    print("Options:")
    options = question[1][1]
    for i, option in enumerate(options):
        print(f"\t{chr(97 + i)}) {option}")
    print("Correct Answer:", question[1][2])
    print("\n")
```

The code defines a variable `tech_text` containing a paragraph of text about the universe. It then uses the `generate_mcqs` function to create 10 multiple-choice questions (`mcqs`). Finally, it loops through the questions, printing the question stem, the available options (labeled a, b, c, d), the correct answer, and a new line.

File Edit Selection View Go Run Terminal Help ← → Question-MCQs-Generator-Using-Machine-learning-NLP-main

EXPLORER ... MCQ Question Generator My Model.ipynb • Question MCQs Generator.ipynb • response.py

QUESTION-MCQS-GENERATOR-... .ipynb\_checkpoints app.py index.html MCQ Question Gen... mcqs.html Question MCQs Gen... README.md

Code + Markdown | Run All | Restart | Clear All Outputs | Variables | Outline ... Python 3.12.1

print("\n") [9] ✓ 0.5s

... Question 1 : \_\_\_\_\_ exploration has allowed humanity to venture beyond Earth and explore the cosmos firsthand.  
Options:  
a) exploration  
b) Space  
c) [Distractor]  
d) humanity  
Correct Answer: B

Question 2 : The search for extraterrestrial \_\_\_\_\_ is a central focus of space exploration, driven by the desire to uncover whether \_\_\_\_\_ exists beyond Earth.  
Options:  
a) exploration  
b) desire  
c) life  
d) search  
Correct Answer: C

Question 3 : From the \_\_\_\_\_ of space to the farthest reaches of distant galaxies, the cosmos holds countless wonders waiting to be explored.

Options:  
a) space  
b) reaches  
c) wonders  
...  
d) sizes  
Correct Answer: B

Output is truncated. View as a [scrollable element](#) or open in a [text editor](#). Adjust cell output [settings...](#)

Spaces: 4 Cell 8 of 9 ENG IN 9:04 AM 5/22/2024

# TEXT SUMMARIZER

The screenshot shows a Google Colab notebook titled "Copy of Text2MCQ.ipynb". The code cell contains the following Python script:

```
print("\n")
print("Summarized Text >>")
for wrp in wrap(summarized_text, 150):
    print(wrp)
print("\n")
```

The output cell shows the results of the nltk package download and the original text:

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]  Unzipping tokenizers/punkt.zip.
[nltk_data] Downloading package brown to /root/nltk_data...
[nltk_data]  Unzipping corpora/brown.zip.
[nltk_data] Downloading package wordnet to /root/nltk_data...

original Text >>
The Indian Rupee (INR) is the official currency of India, symbolized by ₹ and issued by the Reserve Bank of India (RBI). Historically, the rupee has undergone various transformations since its introduction in the 16th century by the Sher Shah Suri. Today, the INR plays a crucial role in India's economy, reflecting its economic stability and growth. The INR is subdivided into 100 paise, and its valuation is influenced by various factors including foreign exchange reserves, inflation rates, and economic policies. The RBI employs monetary policies to manage inflation and stabilize the currency. Additionally, global economic trends, trade balances, and foreign investments significantly impact the rupee's value against other major currencies like the US dollar, euro, and yen. In recent years, the INR has faced volatility due to global financial uncertainties and domestic economic reforms. Initiatives such as demonetization in 2016 and the implementation of the Goods and Services Tax (GST) have had profound effects on its value. Despite challenges, India's burgeoning economy and increasing integration into the global market present opportunities for the rupee to strengthen. The future of the INR is promising, contingent on sustainable economic policies and global economic stability. As India continues to grow as an economic powerhouse, the Indian Rupee is expected to play a pivotal role in the global financial landscape.."
```

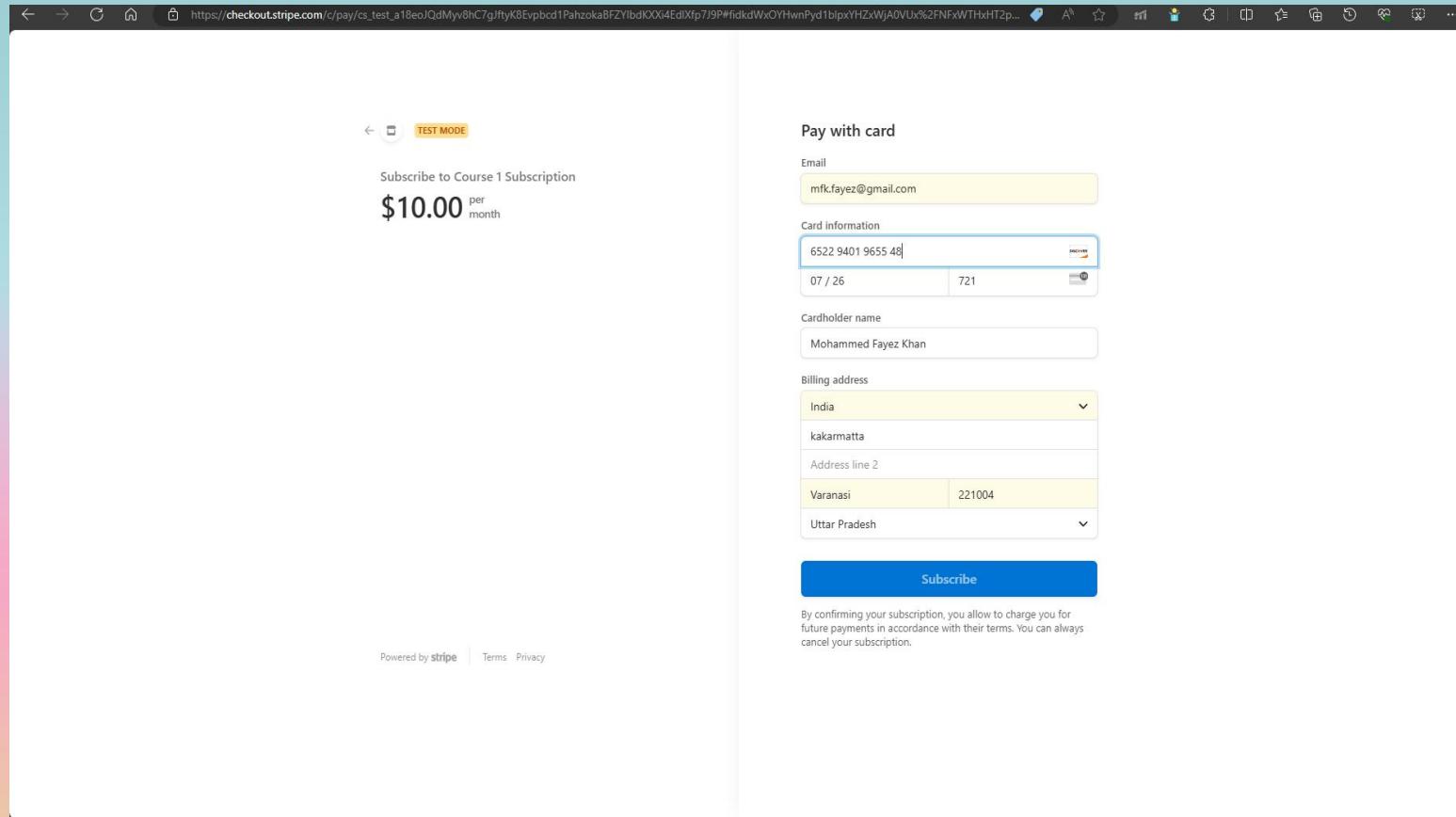
The summary cell shows the summarized text:

```
Summarized Text >>
The rupee has undergone various transformations since its introduction in the 16th century by the Sher Shah Suri. The INR is subdivided into 100 paise and its valuation is influenced by various factors including foreign exchange reserves, inflation rates, and economic policies. Despite challenges, India's burgeoning economy and increasing integration into the global market present opportunities for the currency to strengthen.
```

# Subscription Page

127.0.0.1:5000

<b>HTML</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>	<b>CSS</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>	<b>Analog Electronics</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>
<input type="button" value="Enroll"/>	<input type="button" value="Enroll"/>	<input type="button" value="Enroll"/>
<b>Digital Systems</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>	<b>GATE-ECE</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>	<b>Machine Learning</b> ₹ 6000 for 6 months ₹ 12000 for 12 months ₹ 15000 for self-paced (4 years) <input type="button" value="Learning and Assessment (6 months)"/>
<input type="button" value="Enroll"/>	<input type="button" value="Enroll"/>	<input type="button" value="Enroll"/>
<input type="button" value="Select More Courses"/> Advanced Mathematics Machine Learning Applied Mathematics Deep Learning Artificial Intelligence Data Structures and Algorithm Analog Electronics Quantum Physics Astrophysics Social Media and Society Mobile Application Cloud Beyond Radio and Networking Electrical Science Engineering Mathematics-1 Engineering Mathematics-2 Digital Electronics Introduction to VLSI Cryptocurrency <input type="button" value="Select More Courses"/>		



# Counselling Page

unselling.html

Campuslynx - Home IDE | GeeksforGeeks Problems - LeetCode Strivers A2Z DSA C... Promotions | Barbeque GitHub - keineahnu... >>

This page says

Appointment booked! A confirmation email has been sent to your email address.

OK

Your Email:  
mfk.fayez@gmail.com

Upload your resume (optional):  
Choose File MAJOR\_PR...102134.pdf

Choose a counselor:  
Jane Smith (Expertise: Academic Counseling)

Choose an area of counseling:  
Academic Counseling

Choose a career:  
Medicine

Choose a date for your appointment:  
23 - 03 - 2024

Choose a time for your appointment:  
12 : 30

Schedule Appointment

Know Your Counselor

# Help Center Page

Home Courses Help Centre



## Help Centre

Welcome to the Help Centre. Here are some topics that might help you:

- [Topic 1](#)
- [Topic 2](#)
- [Topic 3](#)

## Contact Support

Name

Email

Message

Submit

# About Us Page

Home Features About Us

## About Us

### Our Mission

We aim to provide a comprehensive learning platform that caters to all your educational needs. Our mission is to make learning accessible, engaging, and personalized.

### Our Features

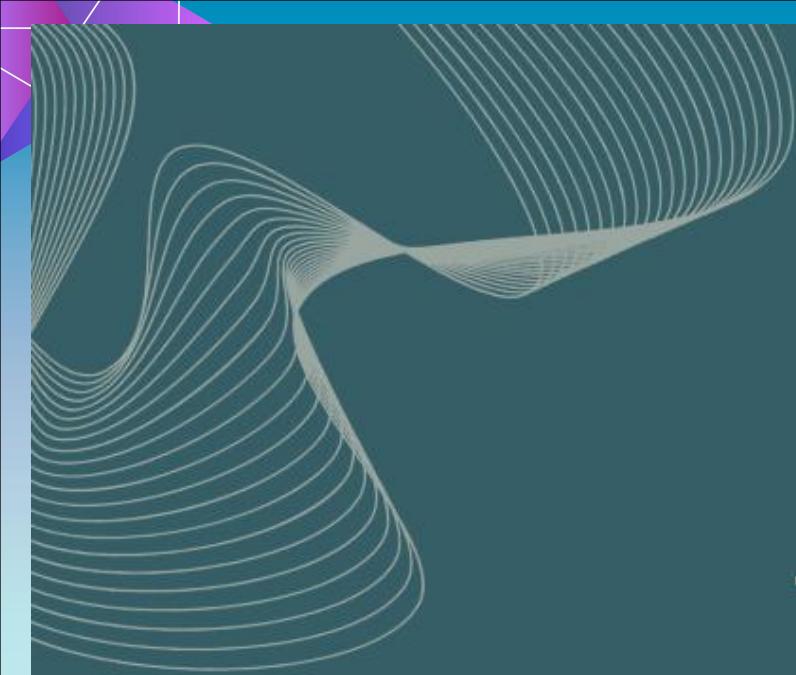
- **Skill Test:** Evaluate your skills with our comprehensive tests.
- **Practice:** Improve your skills with interactive practice sessions.
- **Course Recommendation:** Get personalized course recommendations based on your interests and performance.
- **Book Recommendation:** Discover books that can help you in your learning journey.
- **Career Path Suggestion:** Explore potential career paths that align with your skills and interests.
- **Counselling:** Get guidance and support from our expert counsellors.

# FUTURE SCOPE

- To ensure high accuracy using a large live database.
- Using a fusion of **collaborative and content-based filtering**, designed to provide users with precisely tailored course suggestions.

# REFERENCES

- [1]<https://www.kaggle.com/datasets/khusheekapoor/coursera-courses-dataset-2021>
- [2]<https://www.kaggle.com/datasets/saurabhbagchi/books-dataset>
- [3]Michael J. Pazzani, Daniel Billsus. Content-Based Recommendation Systems.
- [4]H. Jafarkarimi, A. T. H. Sim and R. Saadatdoost, "A naive recommendation model for large databases", International Journal of Information and Education Technology, vol. 2, no. 3, pp. 216, 2012.

The background features abstract white line art on a teal background. On the left side, there are two large, flowing, ribbon-like shapes composed of numerous thin, curved lines. The top shape is oriented vertically, while the bottom shape is more horizontal and overlaps it. The right side of the slide is a solid teal color.

Thank You!