
CAPSTONE PROJECT

Agentic AI for Personalized Course Pathways.

Presented By:

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OUTLINE

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Problem Statement

Students looking to improve their skills or switch careers, especially in rapidly changing tech areas like Frontend Development, Cybersecurity, or UI/UX Design, often feel overwhelmed by the many online courses available. Without personalized guidance, it's difficult to:

- Identify which courses will help them reach their career or learning goals.
- Assess which learning path truly fits their current skills and interests.
- Avoid wasting time on unnecessary or irrelevant material.
- This lack of customized direction can lead to course fatigue, wasted resources, and even a loss of motivation.

Proposed Solution

Conversational Onboarding:

- The AI starts interactive conversations to learn about each student's interests, such as Frontend Development or Cybersecurity, their career goals, and their current knowledge.

Skill Assessment & Gap Analysis:

- Through quizzes and discussions, the system finds out what learners can do now and what they need to work on.

Dynamic Pathway Generation:

- Based on user feedback and progress, LearnMate regularly suggests and updates a customized sequence of courses, changing as goals or preferences shift.

Proactive Coaching:

- The AI gives ongoing feedback, encouragement, and explanations of tough concepts to keep students motivated.

Resource Optimization:

- Using smart filtering, the platform makes sure only the most relevant and useful courses are recommended, saving time and reducing content overload.

To implement LearnMate successfully:

- The platform works with top online course providers to cover a wide range of content.
- It focuses on strong data privacy and ethical handling of user information.
- Feedback is gathered constantly to improve the recommendations and coaching experience.

Impact:

- Learners see quicker progress, greater motivation, and personalized paths, no matter their background. Educational providers experience better engagement and completion rates. This personalized, one on one mentorship approach benefits every digital learner on a large scale.
- subheading

System Approach

This section describes the strategy and tools used to build the Personalized Course Recommendation System.

System Requirements

- Hardware: 4 to 8 GB RAM, Dual or Quad-core CPU (GPU optional)
- Software: OS (Windows, Linux, macOS), Python 3.8 or higher, Web browser

Required Libraries

- pandas, numpy — Data processing
- requests, BeautifulSoup4 — API and web scraping
- scikit-learn, surprise — Recommendation models
- matplotlib, seaborn — Visualizations
- streamlit or flask — Web interface

Algorithm & Deployment

Algorithm Selection

Used a content-based filtering algorithm to match users with relevant courses based on their skills, goals, and preferences. It's ideal for personalized, goal-driven recommendations.

Data Inputs include:

- Skill level
- Learning goals
- Preferred course type
- Time availability
- Course metadata (topic, difficulty, duration)

Training Process

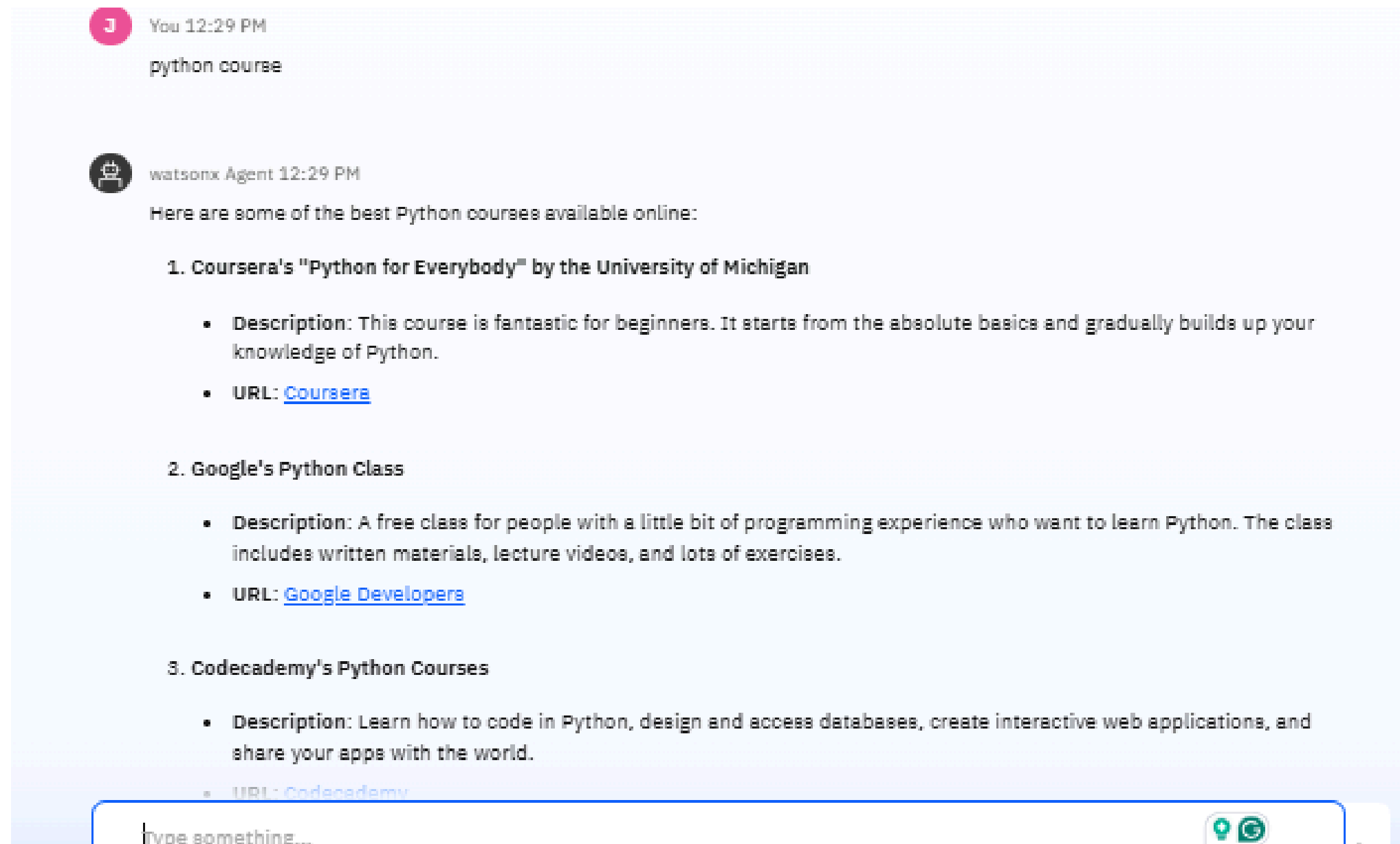
Used course data and user profiles to train the model. Techniques include text vectorization (TF-IDF/embeddings) and optional clustering for better personalization.

Prediction Process

Generates a ranked course list based on user input. Updates dynamically with feedback and new data.

Result

To address the challenge of course overload and lack of personalized guidance, our AI agent was developed to analyze student performance and provide tailored course suggestions based on their skill level, learning progress, and career intent.



Result

You 12:30 PM

java certification

watsonx Agent 12:30 PM

Hi, I am watsonx.ai agent. How can I help you?

Java certification is a valuable credential for professionals looking to demonstrate their expertise in Java programming. There are several types of Java certifications offered by Oracle, the company that owns Java. Here are some of the most popular ones:

Oracle Certified Associate, Java SE 8 Programmer (1Z0-808)

- **Description:** This certification is designed for entry-level programmers and covers the basics of Java programming, including syntax, data types, control structures, and object-oriented programming concepts.
- **URL:** [Oracle University](#)



Oracle Certified Professional, Java SE 8 Programmer (1Z0-809)


- **Description:** This certification is for more experienced programmers and covers advanced topics such as Java I/O, Java Collections Framework, Java Stream API, and concurrency.
- **URL:** [Oracle University](#)

Oracle Certified Professional, Java SE 11 Developer (1Z0-819)

- **Description:** This certification is designed for developers who want to demonstrate their expertise in Java SE 11. It

type something...





You 12:25 PM

explain about front end developement

watsonx Agent 12:25 PM

Hi, I am watsonx.ai agent. How can I help you?

Front-end development is the practice of creating the user interface and user experience of a website or web application. It involves using various technologies and tools to design, develop, and implement the visual and interactive elements that users engage with when they visit a website. Here are some key aspects of front-end development:



Key Technologies

1. **HTML (HyperText Markup Language)**
 - HTML is the standard markup language for creating web pages. It provides the structure of a web page using elements like headings, paragraphs, links, images, and more.
2. **CSS (Cascading Style Sheets)**
 - CSS is used to style and layout web pages. It controls the presentation of HTML elements, including colors, fonts, spacing, and layout.
3. **JavaScript**
 - JavaScript is a programming language that adds interactivity to web pages. It allows developers to create dynamic content, control multimedia, animate images, and more.

Frameworks and Libraries

1. **React**
 - React is a JavaScript library for building user interfaces, particularly single-page applications. It allows developers to create reusable UI components.
2. **Angular**
 - Angular is a platform and framework for building single-page client applications using HTML and TypeScript. It provides a comprehensive set of tools for building robust web applications.

Type something...



Conclusion

In today's rapidly evolving tech landscape, learners face overwhelming choices when it comes to online courses. Our AI-based personalized Course Recommendation Agent effectively addresses this challenge by providing intelligent, data-driven guidance tailored to individual student needs.

By analyzing academic performance (scores and grades), the system classifies learners into different proficiency levels and recommends courses that align with their skills, goals, and interests.

This approach:

- Increases learning efficiency and focus
- Boosts learner motivation with a clear, achievable pathway
- Bridges the gap between where learners are and where they want to be
- This project serves as a foundation for future enhancements such as integrating real-time feedback, adaptive learning paths, and seamless integration with major e-learning platforms.

Future scope

Integration with Online Platforms:

- Connect with platforms like Coursera, Udemy, or edX to recommend real-time course options.

Dynamic Skill Assessment:

- Use quizzes or project evaluations to continuously update learner profiles.

Natural Language Input:

- Allow users to describe goals in plain language and receive AI-driven suggestions.

Career Path Mapping:

- Recommend full learning roadmaps aligned with specific job roles or industry trends.

User Feedback Loop:

- Incorporate user satisfaction and success rates to improve recommendation accuracy.

AI Chat Support:

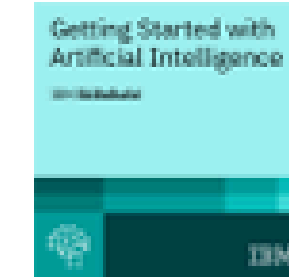
- Add an interactive chatbot for real-time guidance and course clarification.

References

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- Hugging Face – Transformers for NLP. (n.d.).

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Completion Certificate



This certificate is presented to

Janarthanan P

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT)

Learning hours: 20 mins

THANK YOU