CAPSTONE PROJECT

LEARNMATE – AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS

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OUTLINE

- Problem Statement (Should not include solution)
- Proposed System/Solution
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References



PROBLEM STATEMENT

Students often struggle to identify the right learning path that aligns with their interests and long-term goals. The vast number of online courses and lack of personalized guidance make it difficult to choose an optimal educational journey. Students need a solution that tailors course recommendations based on their unique preferences, current skill level, and goals, and that evolves as they progress.



PROPOSED SOLUTION

- The proposed system aims to address the challenge of guiding students to identify the right learning path that aligns with their interests and long-term goals. This involves leveraging data analytics and machine learning techniques to deliver personalized learning guidance. The solution will consist of the following components:
- Data Collection:
 - Gather data on students' backgrounds, current skills, areas of interest (e.g., Frontend Development, Cybersecurity, UI/UX Design), and long-term career goals.
 - Utilize real-time sources such as student interactions, guiz results, course feedback, and progression metrics to enhance personalization and adapt recommendations.
- Data Preprocessing:
 - Clean and preprocess collected data to handle missing information, outliers, and inconsistencies in self-reported skills or preferences.
 - Feature engineering to extract relevant aspects from the data that could impact learning recommendations—for example, learning style, pace, or past performance.
- Machine Learning Algorithm:
 - Use algorithms like collaborative filtering, sequence models, or reinforcement learning to recommend and continuously update personalized course roadmaps.
 - Use interests, skill gaps, past results, and industry trends to make better recommendations.
- Deployment:
 - Develop an app where students interact with LearnMate to get and track personalized learning paths.
 - Deploy the solution on a scalable and reliable platform, considering performance requirements, responsiveness, and accessibility.
- Evaluation:
 - Evaluate the system's effectiveness by tracking student satisfaction, learning results, path adherence, and goal achievement rates.
 - Fine-tune the model based on feedback and continuous monitoring of prediction accuracy.
 - Result: Personalized learning paths that adapt to student interests and goals.



SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the LearnMate personalized learning path recommendation system. Here's a suggested structure for this section:

- IBM Cloud Lite Services
- IBM Granite Foundation Model
- Watson Assistant (for conversational interface)
- Node.js or Python backend
- MongoDB or IBM Cloudant (for storing user data and progress)
- React.js (for front-end interface)

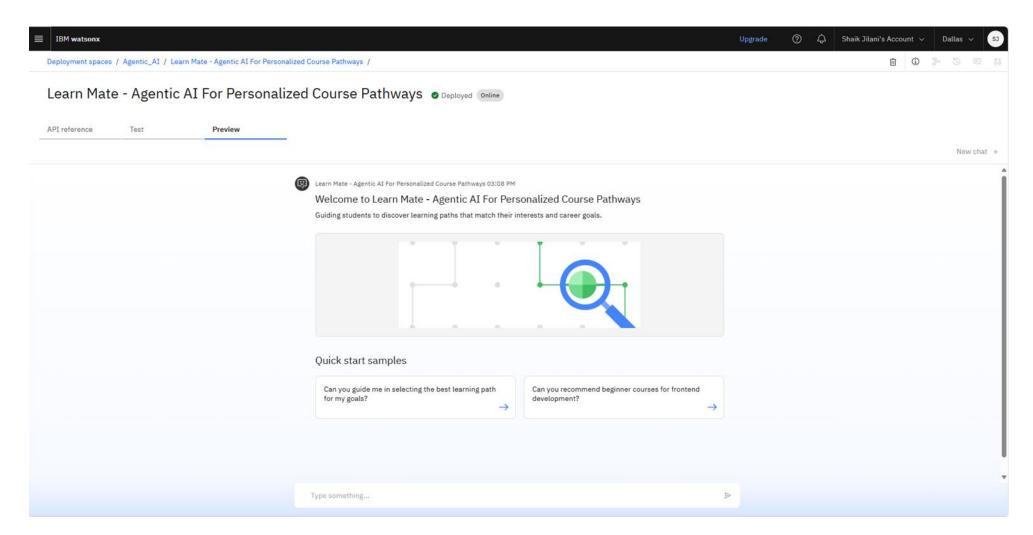


ALGORITHM & DEPLOYMENT

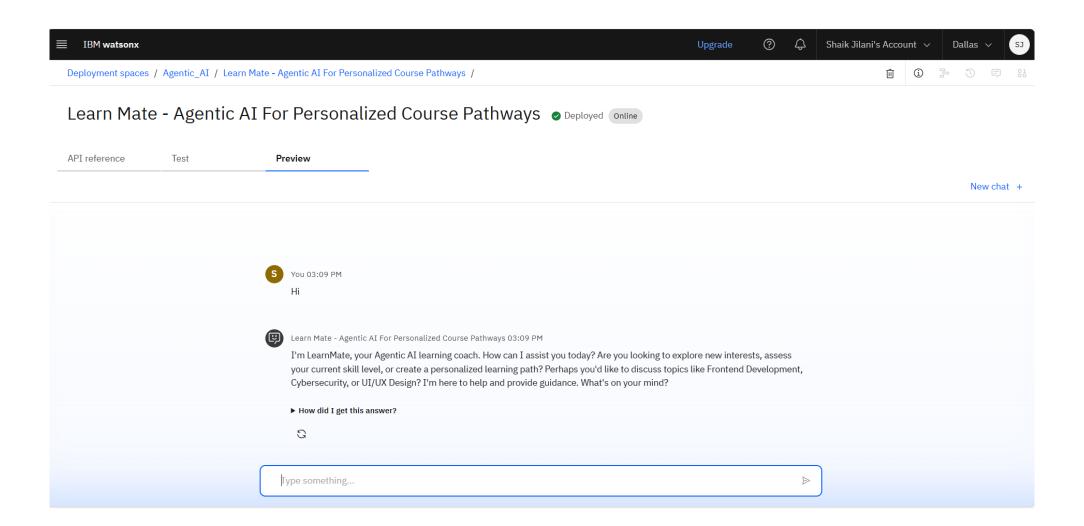
- In the Algorithm section, describe the machine learning algorithm chosen for recommending personalized learning paths:
- Algorithm Selection:
 - Use a recommendation system combining collaborative filtering and content-based filtering.
 - Natural Language Understanding (NLU) for intent recognition and personalized dialogue using IBM Watson & Granite.
- Data Input:
 - Student's interests, skill level (assessed via quiz/interaction), goals, and course metadata.
- Training Process:
 - Fine-tuning IBM Granite model on student interaction data and course content metadata.
- Deployment:
 - Hosted on IBM Cloud (Lite), backend API integrated with frontend and chatbot interface.
 - Dashboard for dynamic course roadmap and skill progress visualization.



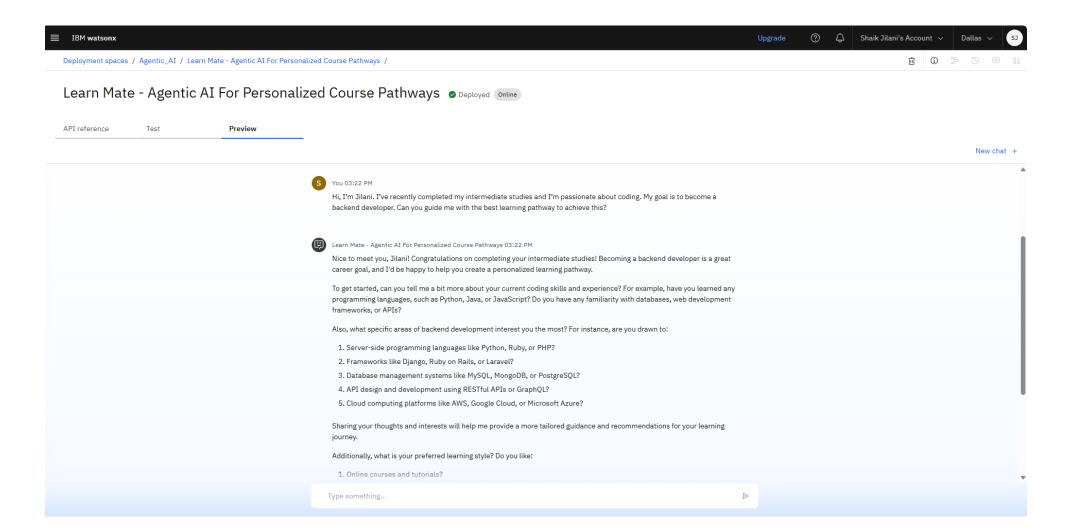
RESULT



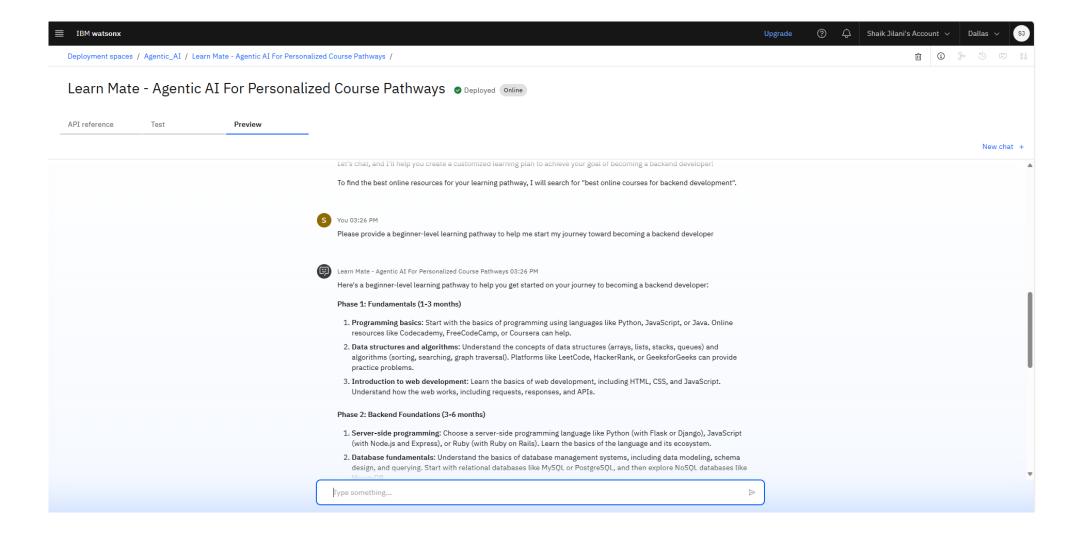














CONCLUSION

LearnMate bridges the gap between abundant online resources and personalized learning needs.
 By leveraging Agentic AI and IBM technologies, students receive guided pathways tailored to their individual goals, skill levels, and evolving interests.



FUTURE SCOPE

- Expand to include integration with major MOOC platforms (Coursera, edX, etc.)
- Enable peer-to-peer mentorship recommendations
- Incorporate voice-based interaction and mobile app
- Add certification tracking and Al-powered motivation nudges



REFERENCES

- IBM Granite Documentation
- IBM Cloud Lite Documentation
- Research papers on personalized recommendation systems
- User-centric design principles in EdTech



IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Shaik Jilani

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



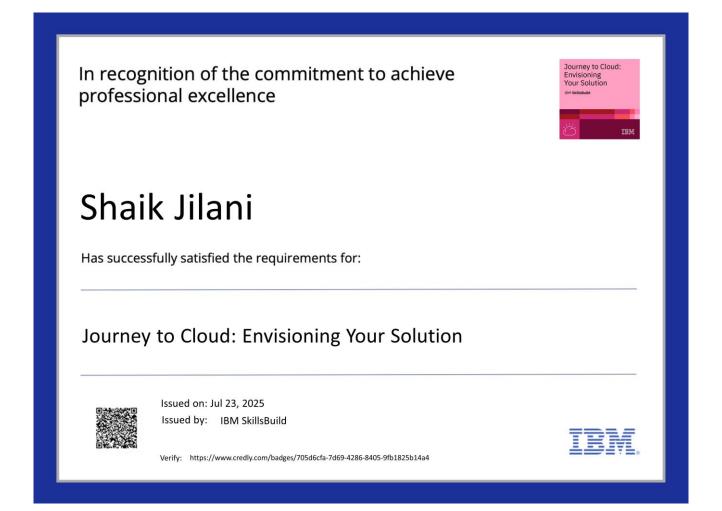
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Completion Certificate



This certificate is presented to

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According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU

