CAPSTONE PROJECT

AGENTIC AL FOR PERSONALIZED COURSE PATHWAYS

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PROBLEM STATEMENT

The Challenge - Students often struggle to identify the right learning path that aligns with their interests and long-term goals due to the overwhelming number of online courses and a lack of personalized guidance. LearnMate aims to solve this by acting as an Agentic Al coach that interacts with students, understands their interests (like Frontend Development, Cybersecurity, UI/UX Design, etc.), assesses their current skill level, and dynamically builds a personalized course roadmap that adapts over time based on progress and preferences.



PROPOSED SOLUTION

SkillPilot is an Agentic Al solution that helps students navigate the overwhelming number of online learning resources by offering personalized course pathways.

Interest & Skill Assessment:

- Interactively identifies user interests (e.g., Frontend, Cybersecurity).
- Evaluates current skill levels using natural language understanding.

Personalized Roadmap Generation:

- Recommends learning paths from uploaded course materials (PDFs, docs).
- Updates roadmap dynamically based on user progress.

Agentic AI with LangGraph + IBM Watsonx:

- Uses LangGraph for reasoning and IBM Granite models for conversation.
- Utilizes Prompt Hub for personalized guidance.

Memory & Adaptation:

- Remembers user history to refine future suggestions.
- Learns and adapts in real time.



SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the personalized course pathway recommendation system using Agentic AI.

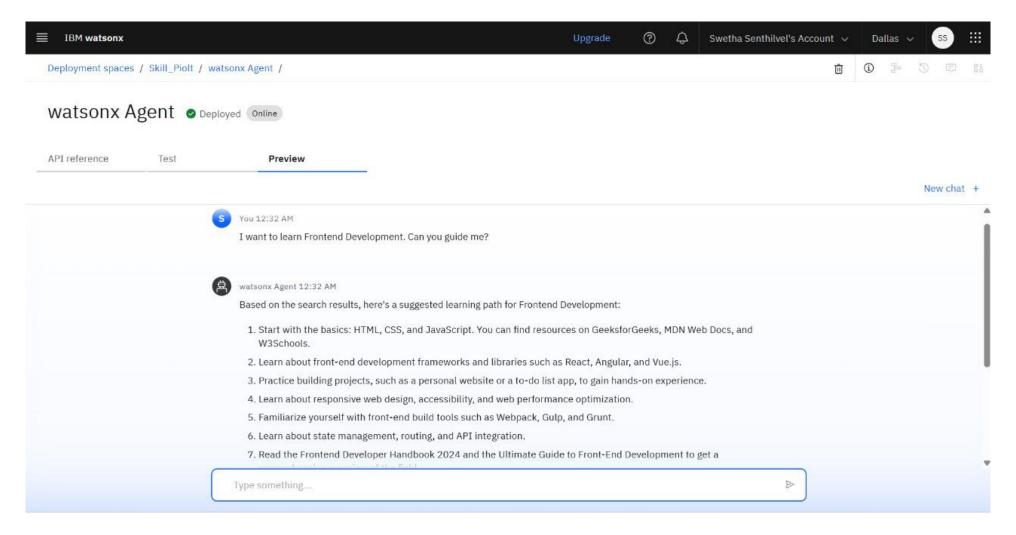
System Requirements

- IBM Watsonx Platform with Granite LLMs
- LangGraph framework with ReAct architecture

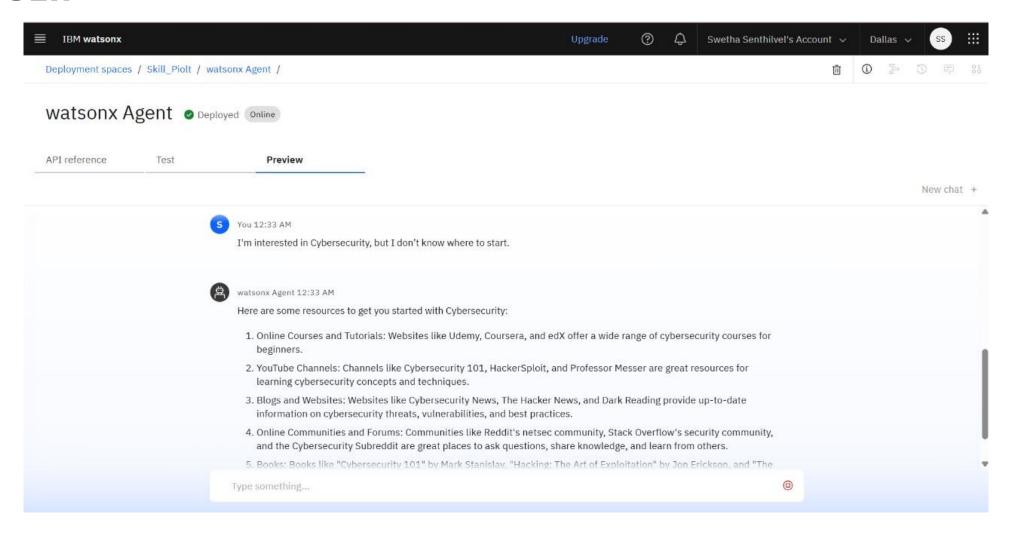
Libraries/Tools Used

- LangGraph (agent orchestration)
- Prompt Hub (dynamic prompting)

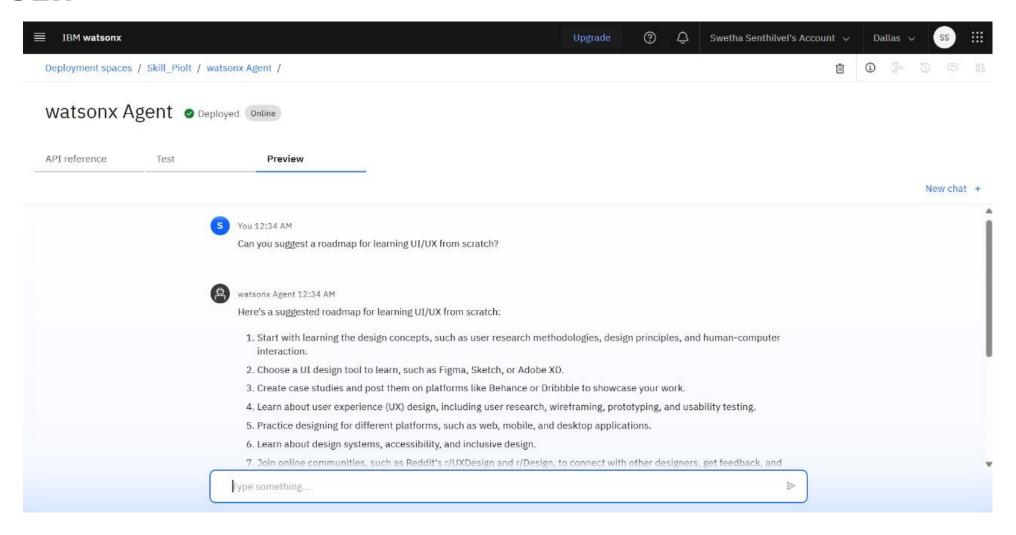




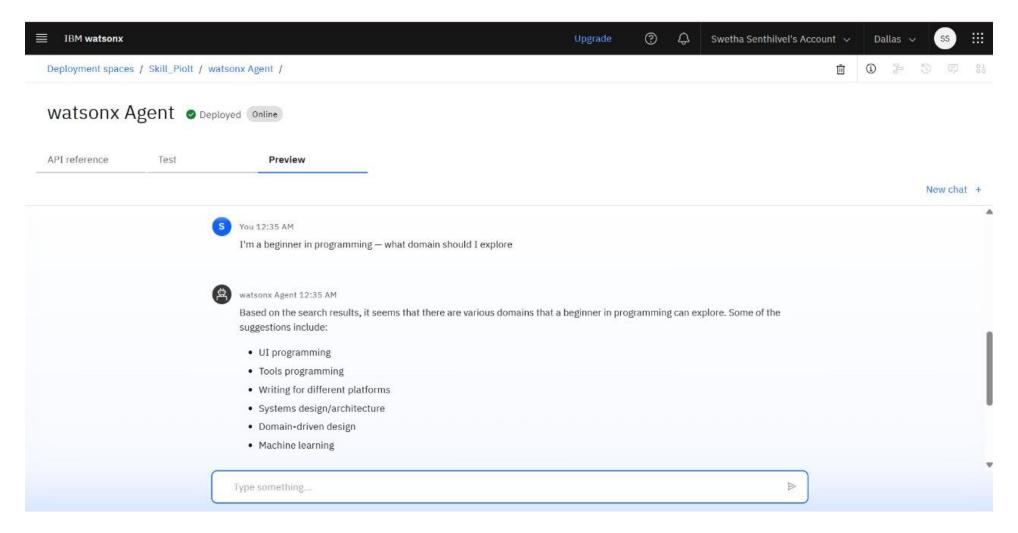




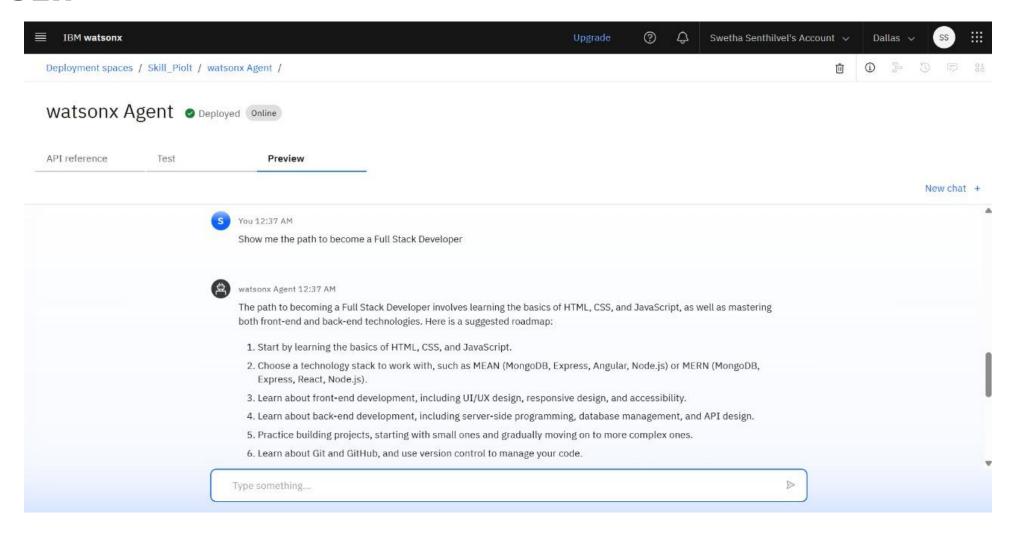




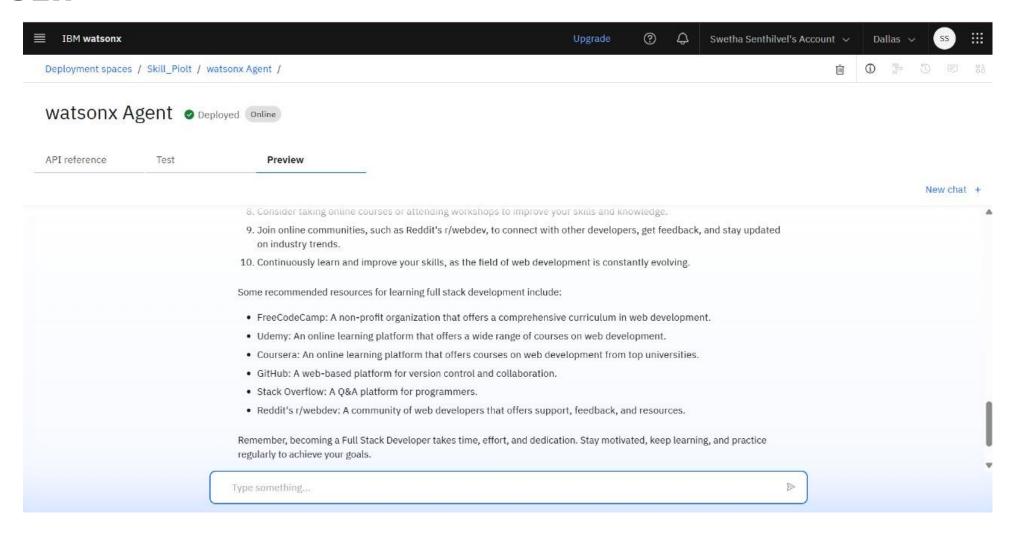














CONCLUSION

SkillPilot effectively addresses the challenge of navigating online learning by offering a personalized, Al-driven course roadmap. By leveraging Agentic Al with IBM Watsonx and LangGraph, it provides adaptive guidance based on individual learner goals and progress. This solution empowers students to take control of their learning journey with clarity and confidence.



FUTURE SCOPE

- Integrate real-time progress tracking using user performance analytics.
- Expand to support multilingual course recommendations and voice-based interactions.
- Enable integration with external platforms like Coursera, edX, or YouTube for live course suggestions.
- Incorporate skill certification suggestions and job-role mapping for career guidance.



REFERENCES

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THANK YOU

