AGENTIC CAREER COUNSELING COMPANION

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OUTLINE

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PROBLEM STATEMENT

Students often lack access to personalized career guidance, which leads to confusion, poor academic decisions, and mismatched career choices.

- **In Simple Terms:**
- Students don’t always know **which career suits them best.**
- They are unsure about **what to study** or **which skills to develop.**
- Traditional career counseling is either:
  - Not available to everyone
  - Too generic or one-size-fits-all
  - Not scalable for large student populations

PROPOSED SOLUTION: STUDENT ACADEMIC ADVISOR AGENT

The proposed system aims to address the problem of students lacking personalized career guidance by creating an AI-powered academic advisor agent. The system uses artificial intelligence, reasoning frameworks, and machine learning models to simulate a human-like guidance counselor. The solution will consist of the following components:

- **Data Collection**
- Collect academic data such as student grades in key subjects (Math, Programming, etc.)
- Gather interest inputs from students (e.g., AI, Design, Web Dev) via form or chat interface
- Optionally include personality traits, goals, or extracurricular strengths
- **Data Preprocessing**
- Normalize and encode categorical values like interests or subjects
- Map interests and skills to relevant career clusters
- Filter and validate user input to maintain quality recommendations

- **AI Framework & Reasoning**
- Use a **Large Language Model (LLaMA 3)** hosted on **IBM watsonx.ai**
- Apply **LangGraph** for flow control and memory
- Employ the **ReAct architecture** to combine reasoning and tool usage (e.g., course search, prediction)
- **Deployment**
- Deployed in **IBM Cloud** via **watsonx.ai Agent Lab**
- User interacts via a chat-style interface (natural conversation flow)
- Can be integrated into web portals or academic dashboards

SYSTEM APPROACH FOR STUDENT ACADEMIC ADVISOR AGENT

✅ 1. System Requirements

- **Hardware:**

  Any laptop/desktop with a browser and internet access

  IBM Cloud account (Free Lite Tier works)

- **Software:**

  IBM watsonx.ai platform (Agent Lab)

  IBM Cloud Deployment Space

(Optional) Python environment (for simulation or custom tools)

2. Libraries & Technologies Used

Tools	Purpose
watsonx.ai	Agent Lab for building AI agents
LangGraph	Manages agent flow and logic
ReAct	Reasoning framework (actions + thoughts)
LLaMA 3	Large Language Model used for prediction
Python	(optional) For custom tool development
GitHub	Version control & portfolio upload

DEPLOYMENT:

•Hosted inside IBM watsonx.ai environment
•Deployed through IBM Cloud's **Deployment Space**
•No separate frontend/backend — interaction handled directly through the Agent interface

• 📦 **Deployment Components:**

Component	Description
Agent Lab	Used to create and configure your AI agent
Model Used	llama-3-3-70b-instruct (from IBM foundation models)
Architecture	ReAct (Reasoning + Actions)
Framework	LangGraph
Tools Added	career_predictor, course_recommender, motivation_tool (defined inside Agent Lab)
Interface	Chat-based preview panel (no coding required)

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RESULT

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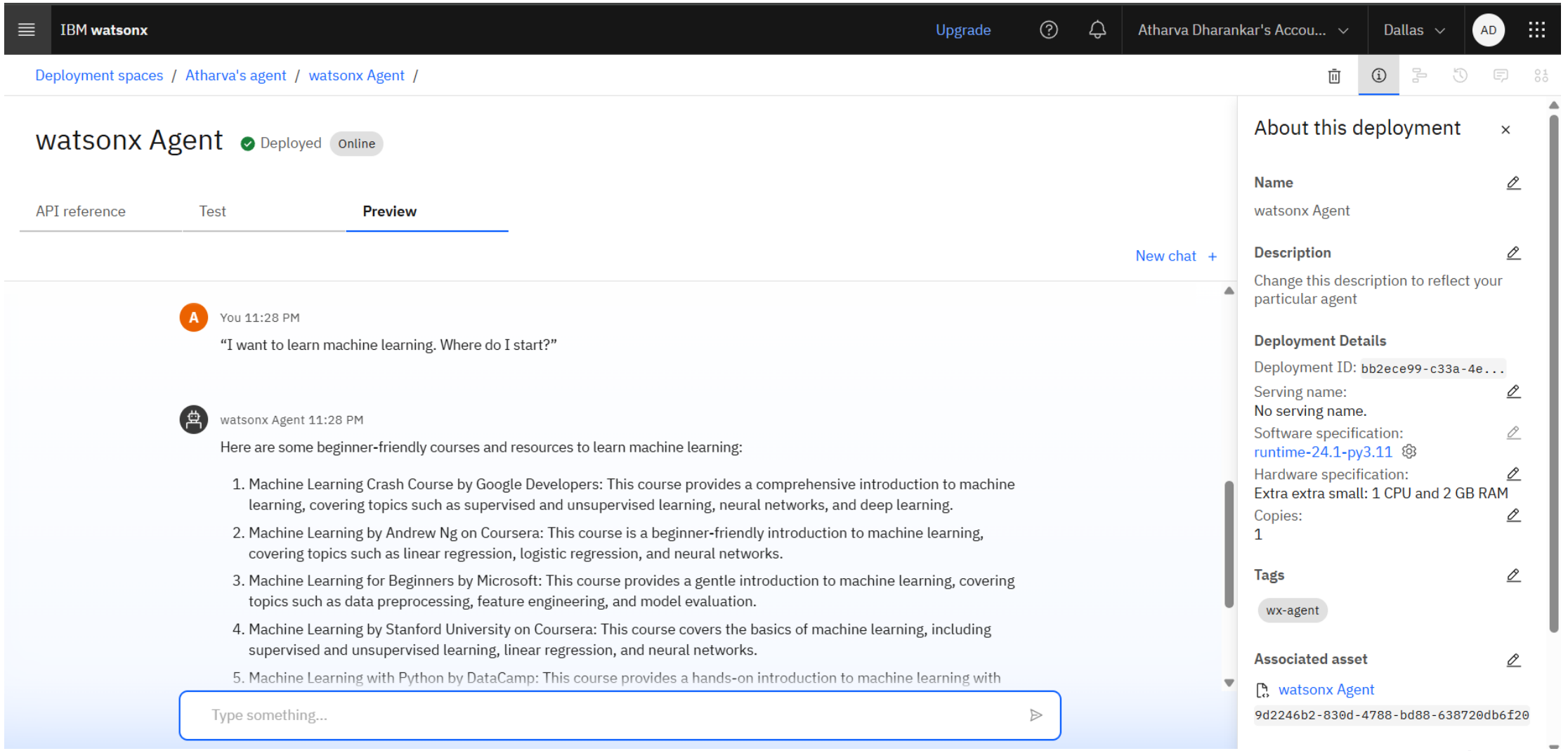
- ✅ Accurately suggested **career paths** based on user inputs like academic performance, skills, and interests
  Examples: Data Scientist, UI/UX Designer, Web Developer
- ✅ Recommended **relevant online courses** (e.g., from Coursera, edX) aligned with the predicted career path
- ✅ Delivered **motivational support** to users, simulating a real academic counselor
- ✅ Enabled **chat-like interaction** using the Preview tool, providing a seamless user experience without needing to write any code
- ✅ Fully deployed in IBM Cloud's **Deployment Space**, accessible anytime for testing and demonstration

RESULT PREVIEW



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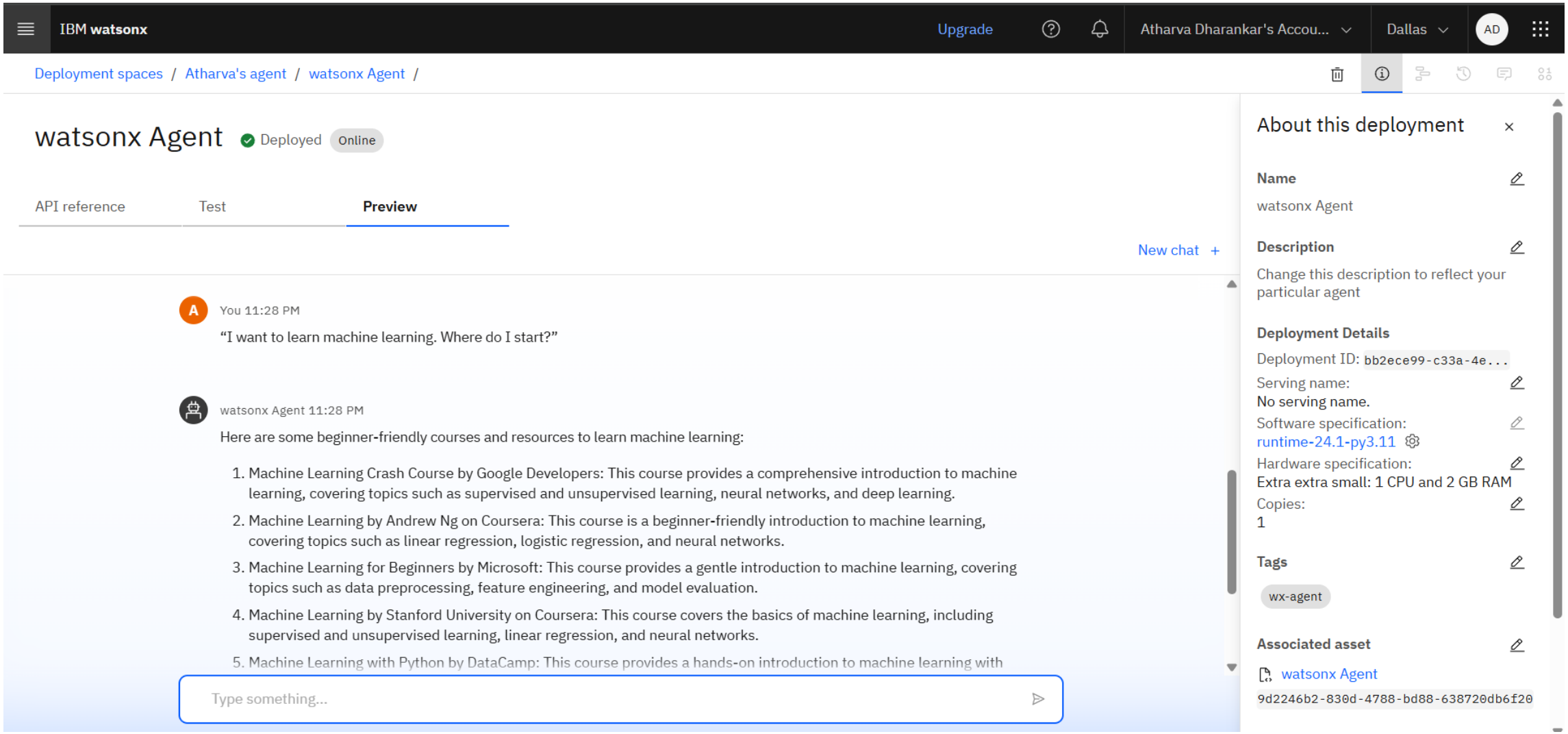

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CONCLUSION

- The **Agentic Career Counseling Companion** successfully demonstrates how artificial intelligence can enhance academic and career guidance for students. By leveraging IBM watsonx.ai, LangGraph, and the LLaMA 3 model, the system simulates a personalized academic advisor that suggests suitable career paths and learning resources based on a student's performance and interests.
- This AI-driven solution makes counseling more **accessible**, **scalable**, and **interactive**, bridging the gap where traditional human-based career guidance is limited. It has the potential to empower students in making informed decisions, reduce uncertainty, and pave the way for smarter educational planning.

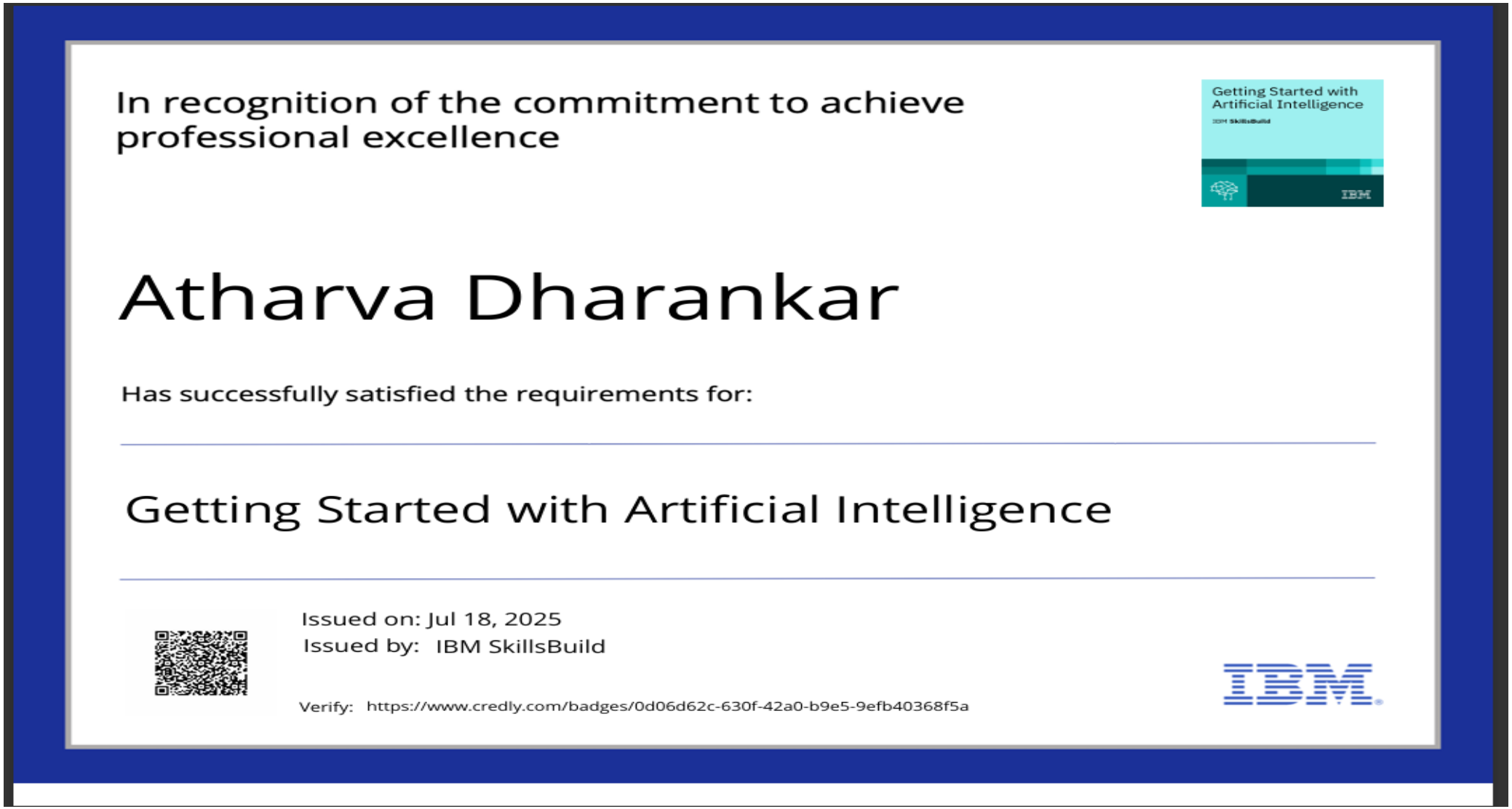
FUTURE SCOPE

- Add **voice interaction** for accessibility and ease of use
- Integrate with **student databases** for real-time academic input
- Provide **personalized progress tracking** and dynamic guidance
- Enable **multilingual support** to reach more students
- Deploy as a **mobile app or chatbot** on school websites
- Fine-tune the AI model for **more accurate and personalized counseling**

REFERENCES

- **IBM watsonx.ai Documentation**
  https://www.ibm.com/cloud/watsonx-ai
- **LangGraph Framework** – Building agent workflows with LLMs
  https://www.langgraph.dev/
- **ReAct Architecture** – Reasoning + Acting in language models
  Paper: *ReAct: Synergizing Reasoning and Acting in Language Models*
  https://arxiv.org/abs/2210.03629
- **LLaMA 3 by Meta AI** – Foundation model used in your project
  https://ai.meta.com/llama/
- **AI in Career Counseling** – Academic research paper
  Singh, R. & Kumar, A. (2021). International Journal of Educational Technology
  https://doi.org/10.1007/s10639-020-10436-3

IBM CERTIFICATIONS



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IBM **SkillsBuild** Completion Certificate

This certificate is presented to

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for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT) **Learning hours:** 20 mins

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THANK YOU

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