
CAPSTONE PROJECT

Library AI Agent

Presented By

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B.E CSE

OUTLINE

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Problem Statement

A Library AI Agent is an intelligent system designed to assist students in finding the right learning materials based on their academic needs. It can autonomously analyze user profiles, study topics, and course syllabus to suggest relevant books and resources. Using natural language processing, it understands student queries and matches them with the most suitable books in the library database. The agent can check real-time book availability, prioritize high-demand titles, and assist with reservation or waitlist actions. It saves time by streamlining the search process and offering personalized recommendations aligned with current academic work. Library AI Agents enhance access, engagement, and resource utilization in educational environments.

Proposed Solution

The Library AI Agent intelligently:

- Understands student queries via Natural Language Processing (NLP).
- Analyzes course syllabus and user profiles.
- Suggests personalized resources.
- Checks book availability in real-time.
- Prioritizes high-demand titles.
- Supports reservations and waitlists.

This results in efficient and tailored access to relevant academic materials.

System Approach

Platform & Tools Used:

- **IBM Cloud Lite**
- **IBM Watsonx AI Services**
- **Watson Studio / Agent Lab**
- **Jupyter Notebook (Python 3.11)**

Libraries:

- **ibm_watsonx_ai** – For deploying and testing AI service
- **JSON** – To structure input/output
- **Python NLP libraries** (optionally used in service layer)

Algorithm & Deployment

- AI Agent Workflow:

1. Input: Natural language query from student.
2. Prompt Processing: AI agent interprets the query using prompt lab.
3. Matching Logic: Cross-references with syllabus/book database (mock or live).
4. Output: Personalized book recommendations and availability.

- Deployment:

1. Packaged as an AI Service on IBM Cloud.
2. Deployed using IBM Watsonx Agent Lab and tested through the notebook.

Result

- Student Query: "I need books for machine learning in Python for my 5th semester."
- AI Agent Output:
- "Python Machine Learning" by Sebastian Raschka (Available)
- "Hands-On ML with Scikit-Learn & TensorFlow" (Waitlisted)

OUTPUT

AS You: 02:06 PM

Hi

LibraryAI Agent 02:06 PM

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

► How did I get this answer?

AS You: 02:07 PM

I need Books for Machine Learning in Python for 5th Semester

LibraryAI Agent 02:07 PM

Here are some books for Machine Learning in Python for 5th Semester:

1. [Introduction to Machine Learning with Python](#)
2. [Learning Python, 5th Edition](#)
3. [Machine Learning for Absolute Beginners](#)
4. [Deep Learning with Python](#)
5. [Deep Learning Book](#)

These books cover a range of topics from basic Python programming to advanced machine learning and deep learning concepts. They are suitable for students in their 5th semester who are looking to gain a solid foundation in machine learning using Python.

Conclusion

- The AI Agent effectively assists in personalizing book recommendations.
- Reduces student search time.
- Enhances engagement with library resources.
- Provides dynamic responses using real-time data and NLP understanding.

Future scope

- Integrate real library APIs for dynamic catalog updates.
- Support voice queries.
- Add multi-language support for international users.
- Analyze user behavior for improved recommendations.

References

- IBM Watsonx AI Documentation
- IBM Cloud API Reference
- NLP Techniques for Recommendation Systems
- Project GitHub - [link](#)

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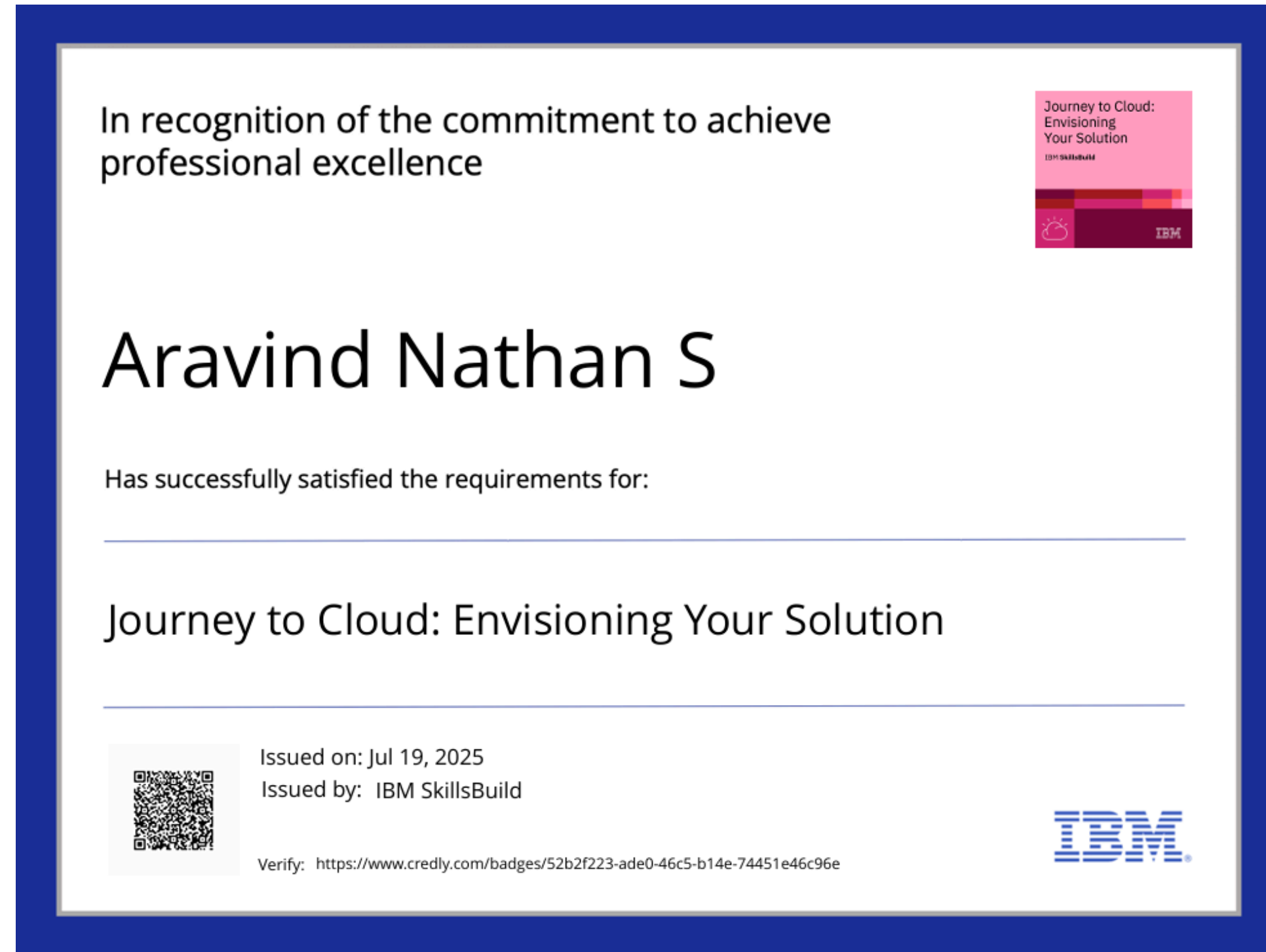
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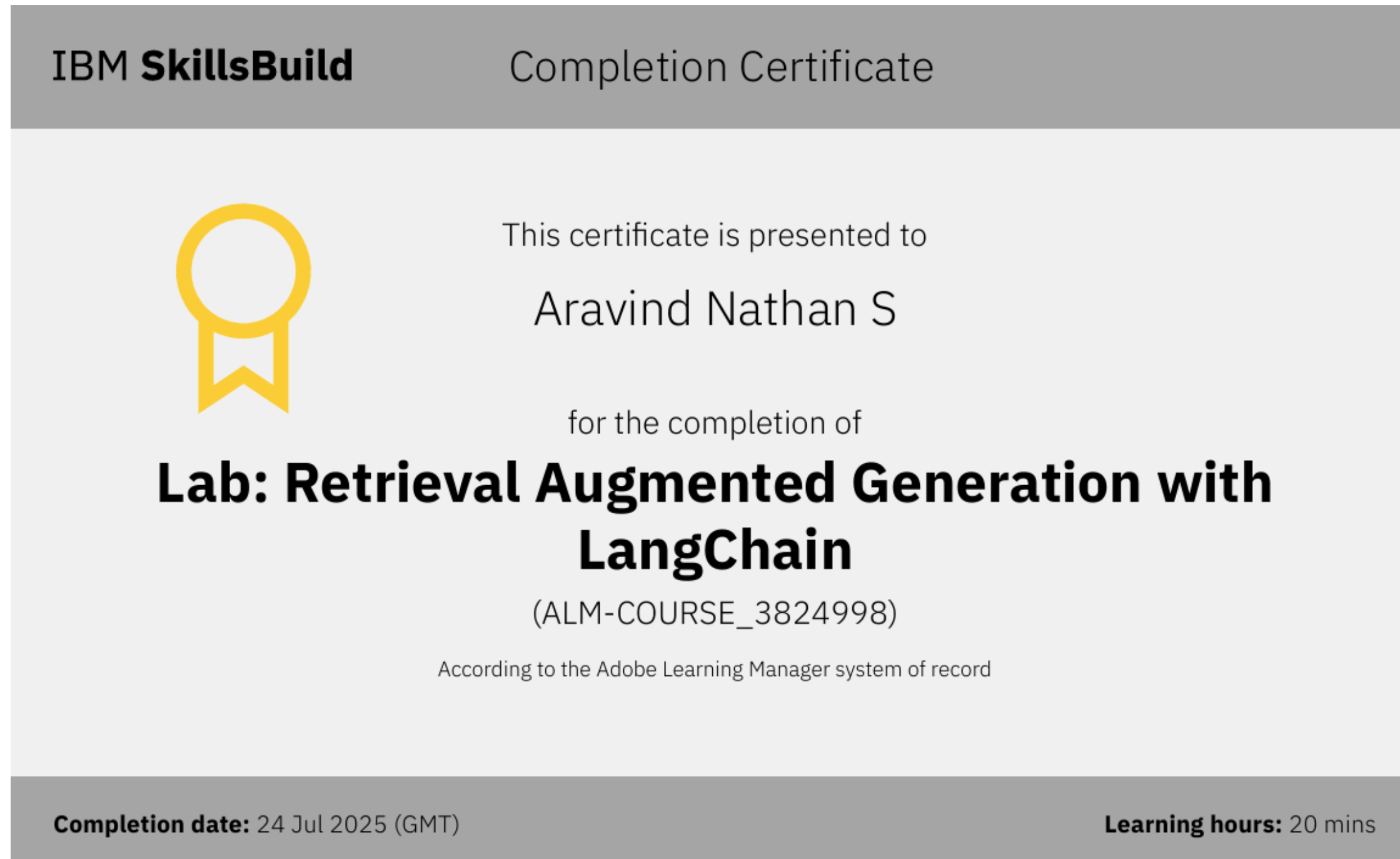
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