# CAPSTONE PROJECT

# LIBRARY AI AGENT

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# OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result
- Conclusion
- Future Scope
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# PROBLEM STATEMENT

In academic environments, students often face difficulties in locating the most relevant learning resources from vast library collections. Manual search is time-consuming and inefficient.
The challenge is to build an **AI-powered Library Agent** that understands student needs, analyzes academic data like course syllabus and topics, and suggests the most suitable books.
The system should also handle real-time availability, prioritization of high-demand titles, and assist in reservations or waitlists..

# PROPOSED SOLUTION

The proposed system is a Library AI Agent that:

- Uses **Natural Language Processing (NLP)** to understand student queries.
- Analyzes **user profiles**, **course syllabi**, and **study topics**.
- Recommends books/resources from the library database.
- Tracks real-time book availability and manages reservations or waitlists.
- Personalizes recommendations to enhance academic efficiency and engagement.

# SYSTEM APPROACH

**System Requirements:**

- IBM Cloud (mandatory)
- IBM Watson/NLP (Granite)
- IBM Cloud Object Storage for dataset handling

**Libraries/Tools:**

- IBM Granite LLM
- Watson NLP Services

# ALGORITHM & DEPLOYMENT

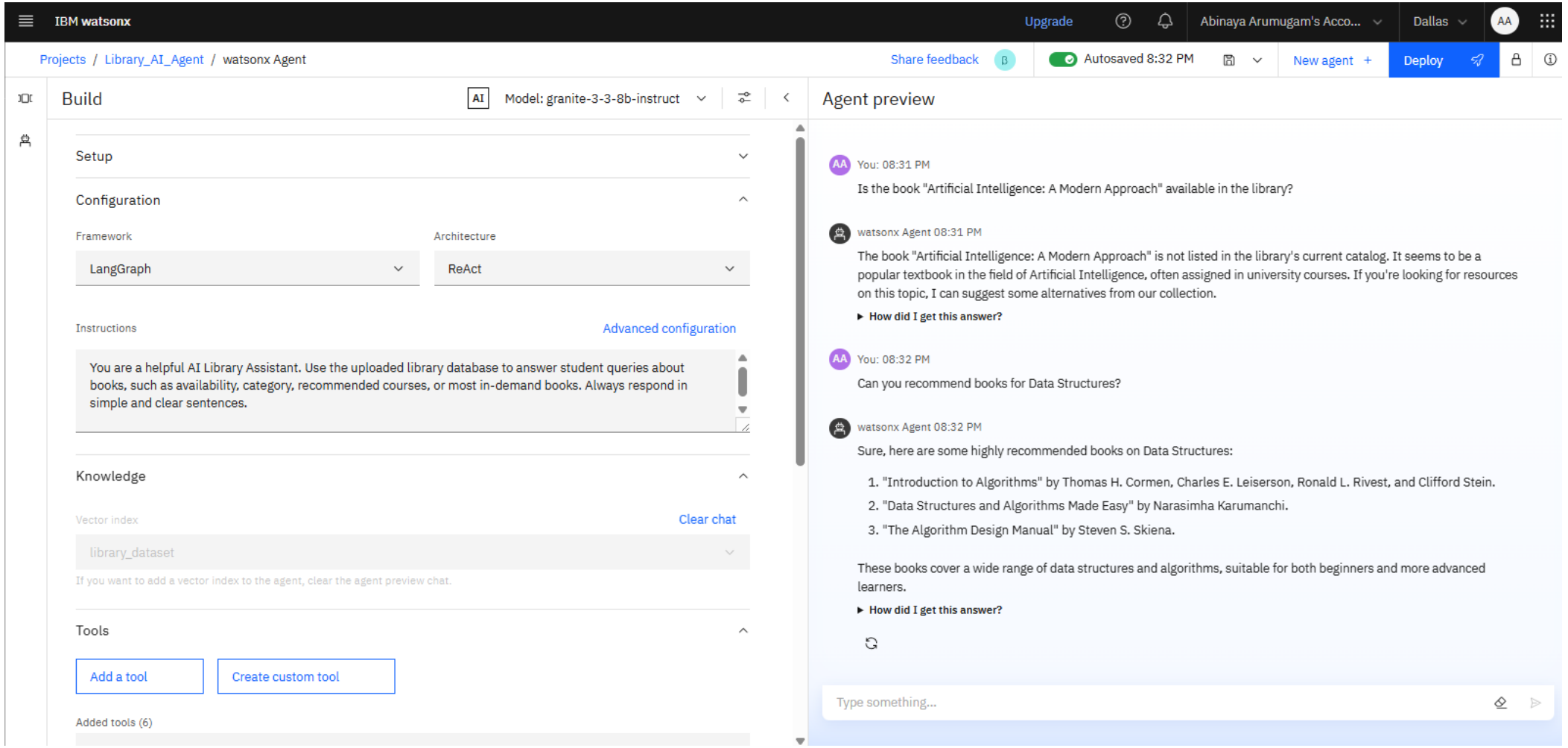
**Algorithm:**

- NLP-based semantic similarity and intent classification
- Query processing with IBM Granite
- Rule-based & AI-based recommendation ranking
- Book prioritization based on availability and demand

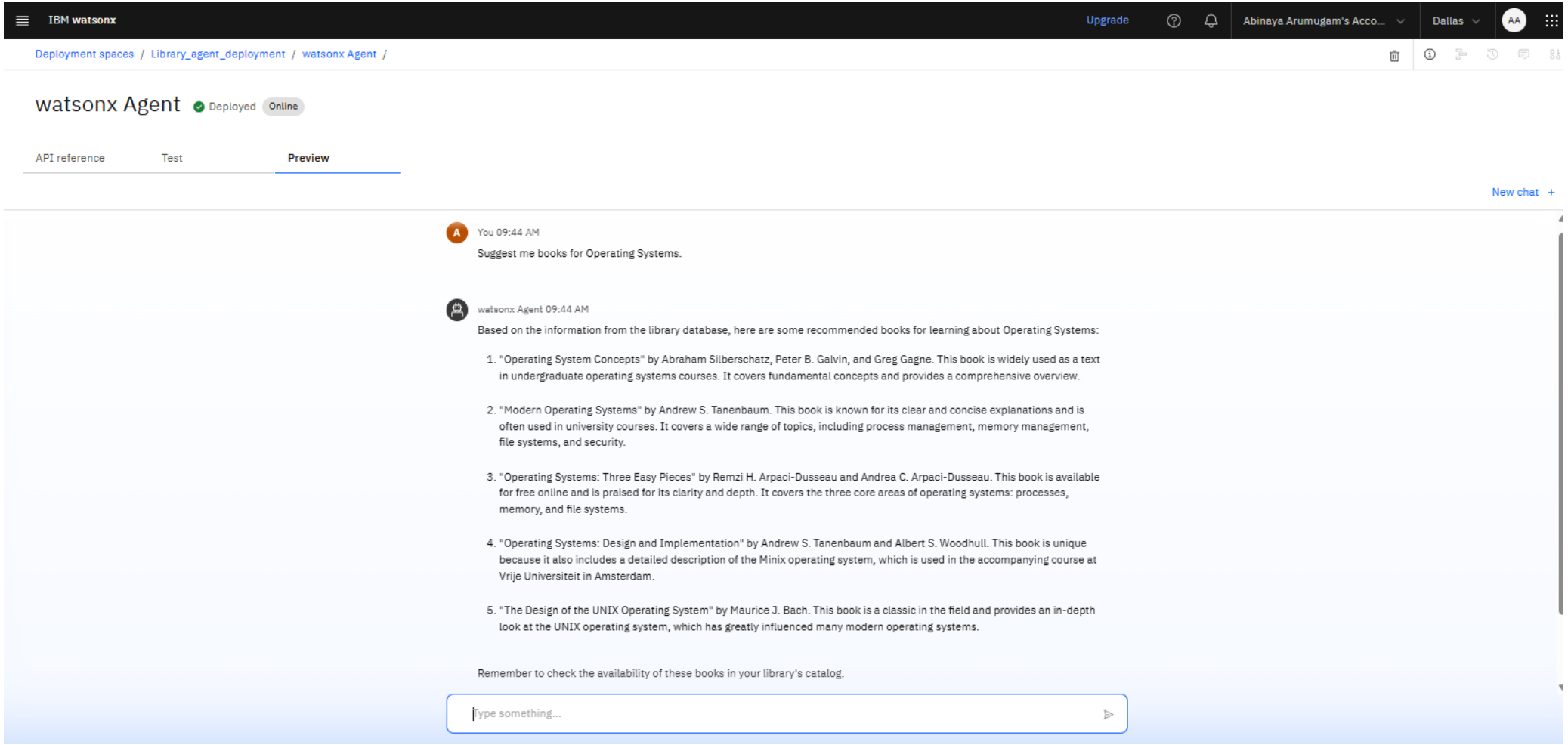
**Deployment:**

- Hosted on IBM Cloud Lite
- NLP queries handled by IBM Granite or Watson

# RESULT



# RESULT

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# CONCLUSION

The **Library AI Agent** simplifies book discovery and saves students valuable time by offering personalized recommendations through AI and NLP. It enhances access to academic resources and improves student-library interaction. This solution demonstrates how combining **AI, NLP, and cloud technologies** can effectively address real-time educational challenges and boost learning efficiency.

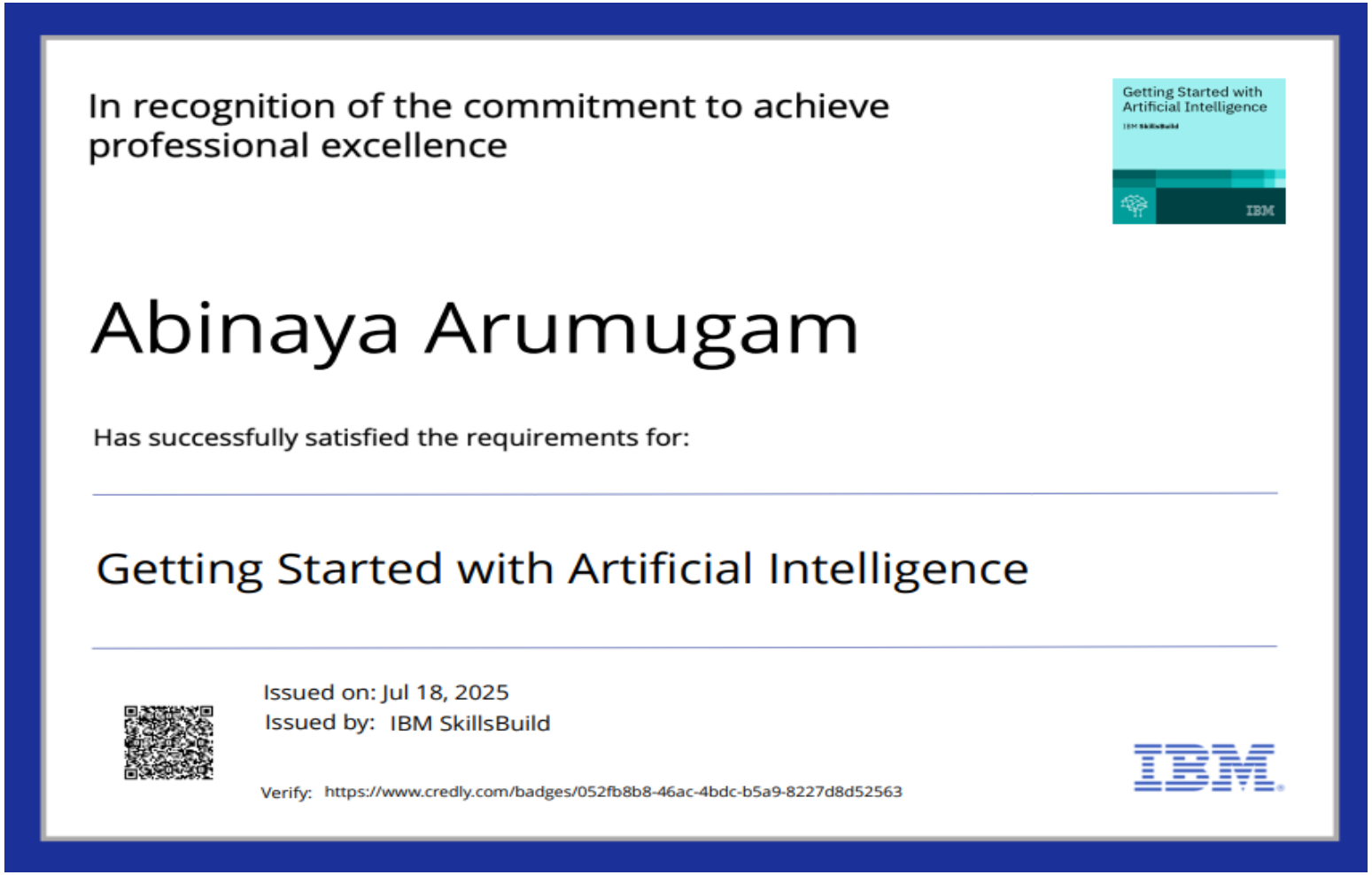
# FUTURE SCOPE

- Multi-language NLP support
- Mobile application integration
- Voice-command-based search assistant
- Integration with e-learning platforms
- Expanded to university-wide or inter-library systems

# REFERENCES


- IBM Watson NLP Docs
- IBM Granite AI Overview
- Research on Recommender Systems in Libraries
- Smart India Hackathon 2025 Problem Statement PDF

# IBM CERTIFICATIONS



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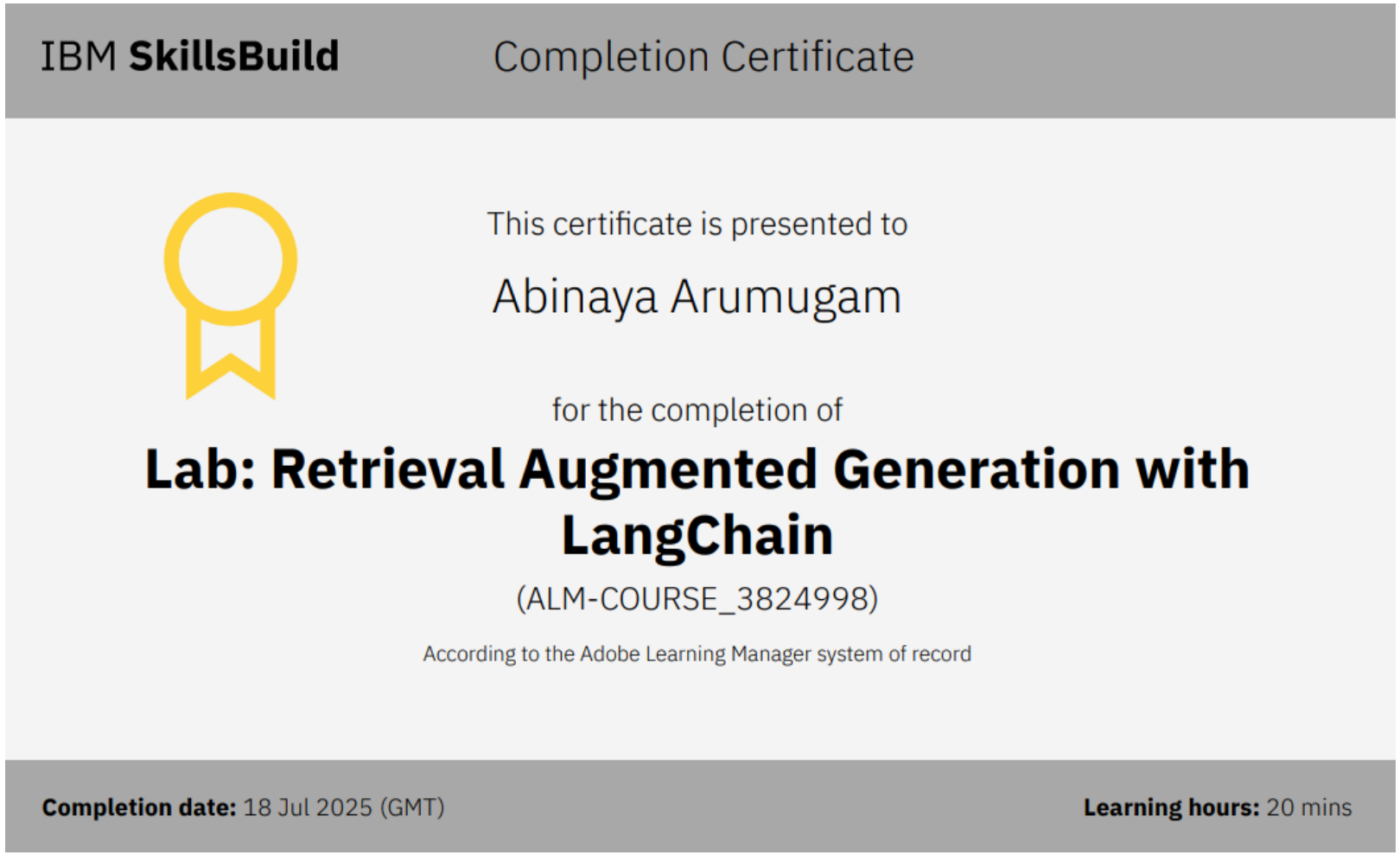

IBM **SkillsBuild** Completion Certificate

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:** 18 Jul 2025 (GMT) **Learning hours:** 20 mins

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# THANK YOU

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