CAPSTONE PROJECT

FITNESS BUDDY

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OUTLINE

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PROBLEM STATEMENT

- In today’s fast-paced world, many individuals struggle to maintain a healthy lifestyle due to lack of personalized guidance, time constraints, and inconsistent motivation. Traditional fitness solutions often require expensive subscriptions, in-person consultations, or rigid schedules that don't adapt to personal preferences or daily routines.
- There is a growing need for an accessible, friendly, and intelligent virtual assistant that can provide ondemand fitness advice, healthy lifestyle suggestions, and basic nutrition guidance—all tailored to individual needs and available at any time.

PROPOSED SOLUTION

The proposed system, Fitness Buddy, aims to address the challenge of promoting consistent health habits and personalized lifestyle support by using IBM's AI-powered capabilities. Rather than using a complex machine learning pipeline, this solution leverages IBM watsonx.ai's Agentic AI to act as an intelligent virtual fitness coach.

It provides:

- Personalized home workout recommendations based on user inputs
- Motivational tips and fitness encouragement
- Healthy and simple meal suggestions
- Habit-building support for long-term consistency

The assistant is built on a lightweight, cost-efficient IBM Cloud Lite setup, eliminating the need for external datasets or high computational resources. The agent utilizes a curated text-based knowledge file and foundational AI model configuration to personalize user experience. The response flow is designed entirely around prompt-based reasoning, enabling fast, scalable deployment without traditional model training.

Interaction is conversational and friendly, offering dynamic help based on real-time inputs. The assistant asks for user name, goal, age, fitness level, and then tailors advice accordingly. This solution uses minimal infrastructure while demonstrating a real-world, conversational AI implementation using only IBM Cloud tools.

SYSTEM APPROACH

- **Platform: IBM watsonx.ai (Agentic AI interface)**
- **Cloud Plan: IBM Cloud Lite**
- **Foundation Model: granite-3-3-8b-instruct**
- **Knowledge Integration: Custom knowledge base (e.g., Dietary guidelines for Indians- pdf from Ministry of Health,India)**

Development Flow:

- Intent Design: Define key user intents—workout help, meal ideas, motivation, habit support.
- Prompt Engineering: Craft a custom system prompt to handle initial greeting, service selection, info collection, and personalized response.
- Model Selection: Use granite-3-3-8b-instruct model with low token limits (512 tokens max) and temperature 0.4 to balance creativity and cost-efficiency.
- Knowledge Base Upload: Upload curated fitness-related .txt file (exercise plans, meal samples, FAQs) as a vector index.
- Response Testing: Validate agent output using sample user flows to confirm accurate task handling.
- Deployment: Keep deployment lightweight—only cloud-native, no additional integrations or UI layers.

Efficiency Configuration:

- Temperature: 0.4
- Max Tokens: 500
- Frequency & Presence Penalty: 0
- Quick-start questions added for smoother onboarding

ALGORITHM & DEPLOYMENT

The system does not rely on a traditional ML algorithm. Instead, it uses instruction-following generative AI from IBM's Granite family to respond to user inputs. The "algorithm" is a series of prompt-engineered flows that guide the agent's reasoning and decision-making. The model interprets intent, extracts contextual data (age, fitness level, health concerns), and reasons over a vector knowledge base.

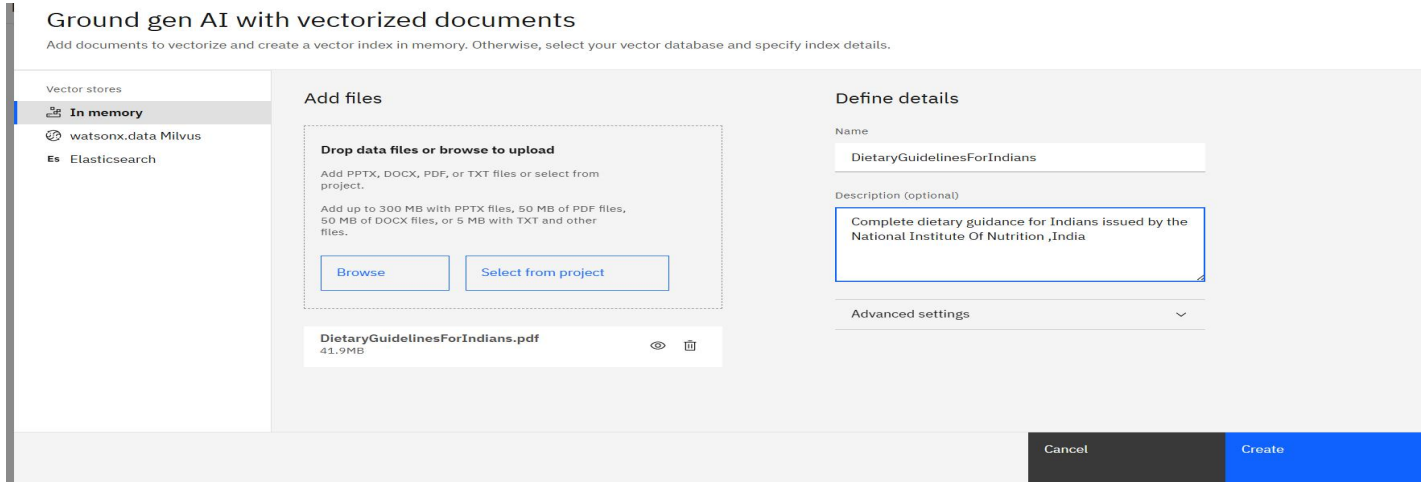
Steps Followed:

- User greets the agent.
- Agent requests name and offers a list of services (workout, motivation, meals, habits).
- Based on user choice, the agent asks for age, fitness level, and any health-related flags.
- The model uses this context to generate a personalized response.
- If relevant, it fetches text snippets from the knowledge base to supplement the response.
- Ends with a follow-up like "Would you like help with anything else?"

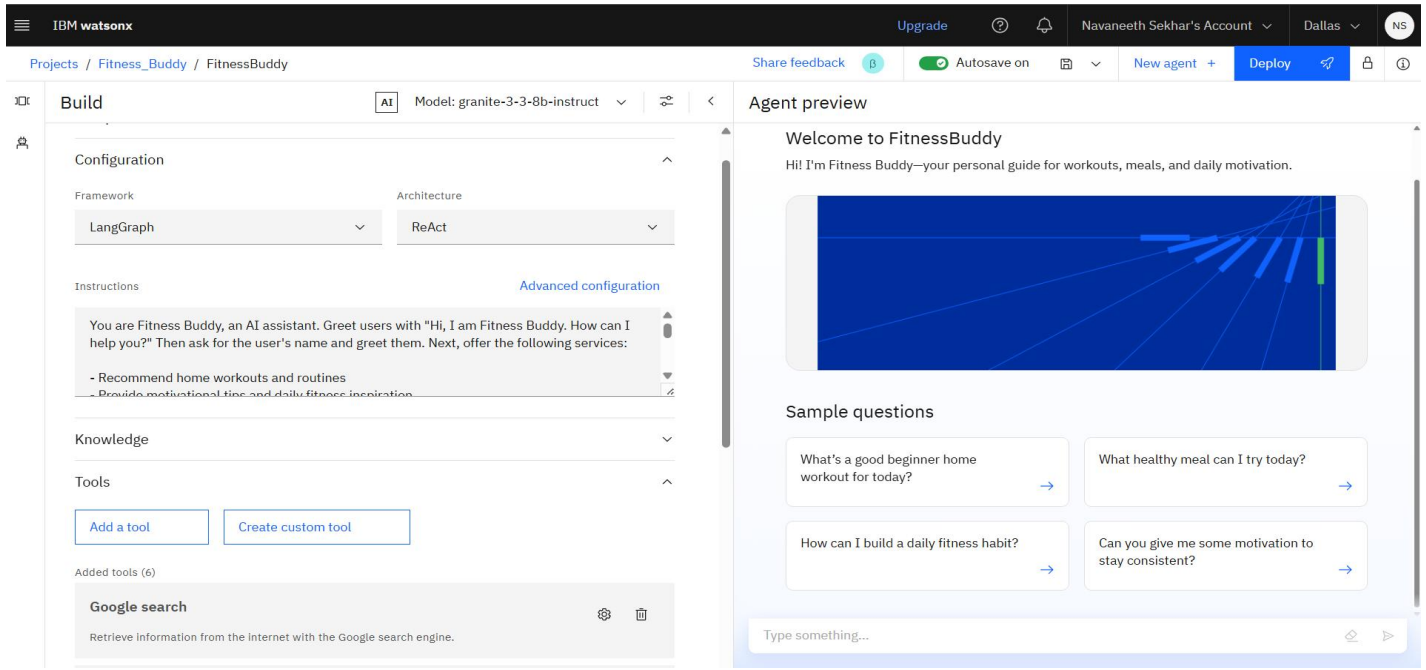
Deployment Process:

- Designed entirely inside IBM watsonx.ai Agent Builder
- Knowledge base indexed from .txt file using vector index tool
- No backend coding or API integration needed
- Model run settings configured to reduce resource usage (Lite-friendly)
- Agent is tested directly within the IBM interface for performance and reliability

RESULT



custom knowledge base



Instructions for the Agent

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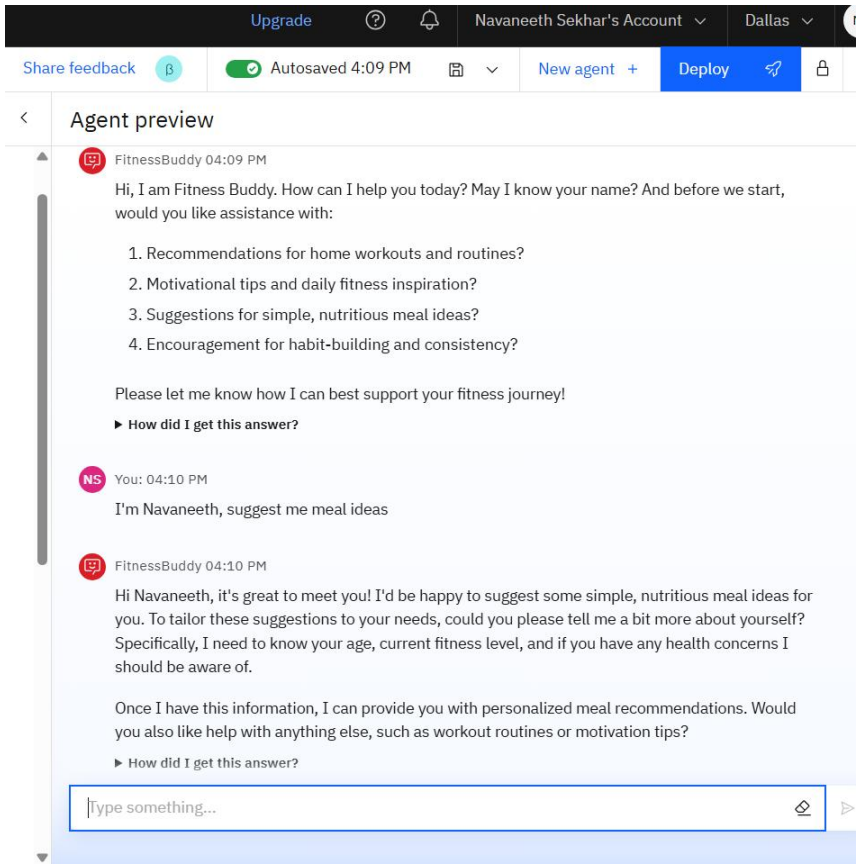
RESULT



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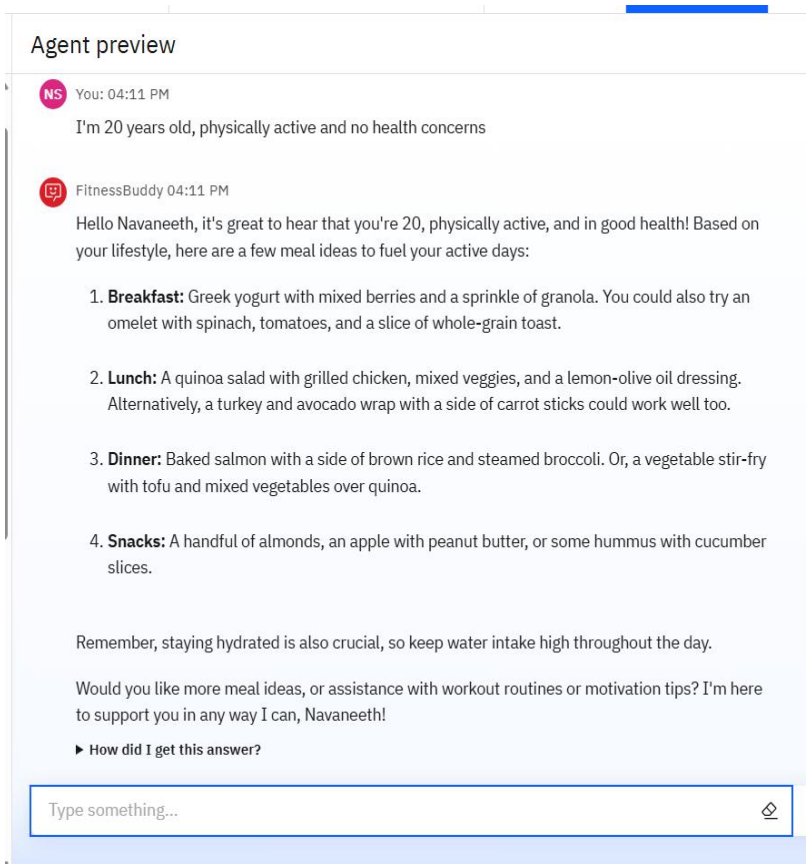

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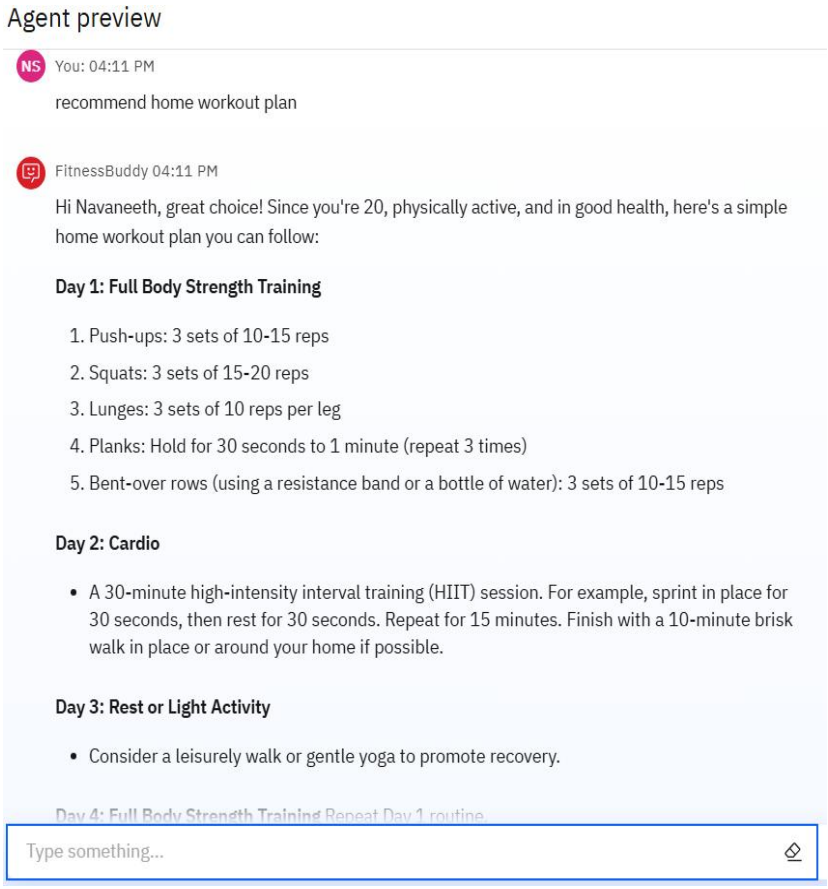

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working example of the Agent

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CONCLUSION

- The Fitness Buddy project successfully demonstrates how IBM's Agentic AI platform can be leveraged to build a lightweight, intelligent virtual assistant without requiring traditional machine learning pipelines or complex infrastructure. By using prompt engineering, a carefully curated knowledge base, and optimized model configurations, the solution provides meaningful fitness guidance, motivation, healthy meal ideas, and habit-building suggestions in a fully conversational format.

FUTURE SCOPE

- Multi-modal capabilities: Expand the assistant to accept voice input or visual fitness tracking via image uploads.
- Mobile/Web UI integration: Add a user interface layer (using Watson Web Chat, Flutter, or React) for broader access.
- User data persistence: Integrate IBM Cloudant or object storage to track and personalize user goals and progress over time.
- Notification system: Implement daily reminders for workouts, water intake, or motivational nudges using IBM Functions or App Connect.
- Broader domain coverage: Add sleep guidance, stress management, and mental wellness support through additional knowledge files.
- Scalability: Transition from Lite to paid IBM Cloud plan for higher resource limits and larger model use (e.g., Granite Chat v2 or LLaMA-3 for more advanced interaction).
- Multi-language support: Integrate multilingual prompts to support users in regional languages.

REFERENCES

- IBM watsonx.ai Documentation
- IBM Agentic AI – Foundation Models
- IBM Cloud Lite Plan Documentation
- National Institute of Nutrition, India – Dietary Guidelines for Indians
- Custom Fitness Knowledge Base (Manually curated file containing beginner workouts, motivational quotes, healthy meal examples, and FAQs used for agent reasoning.)

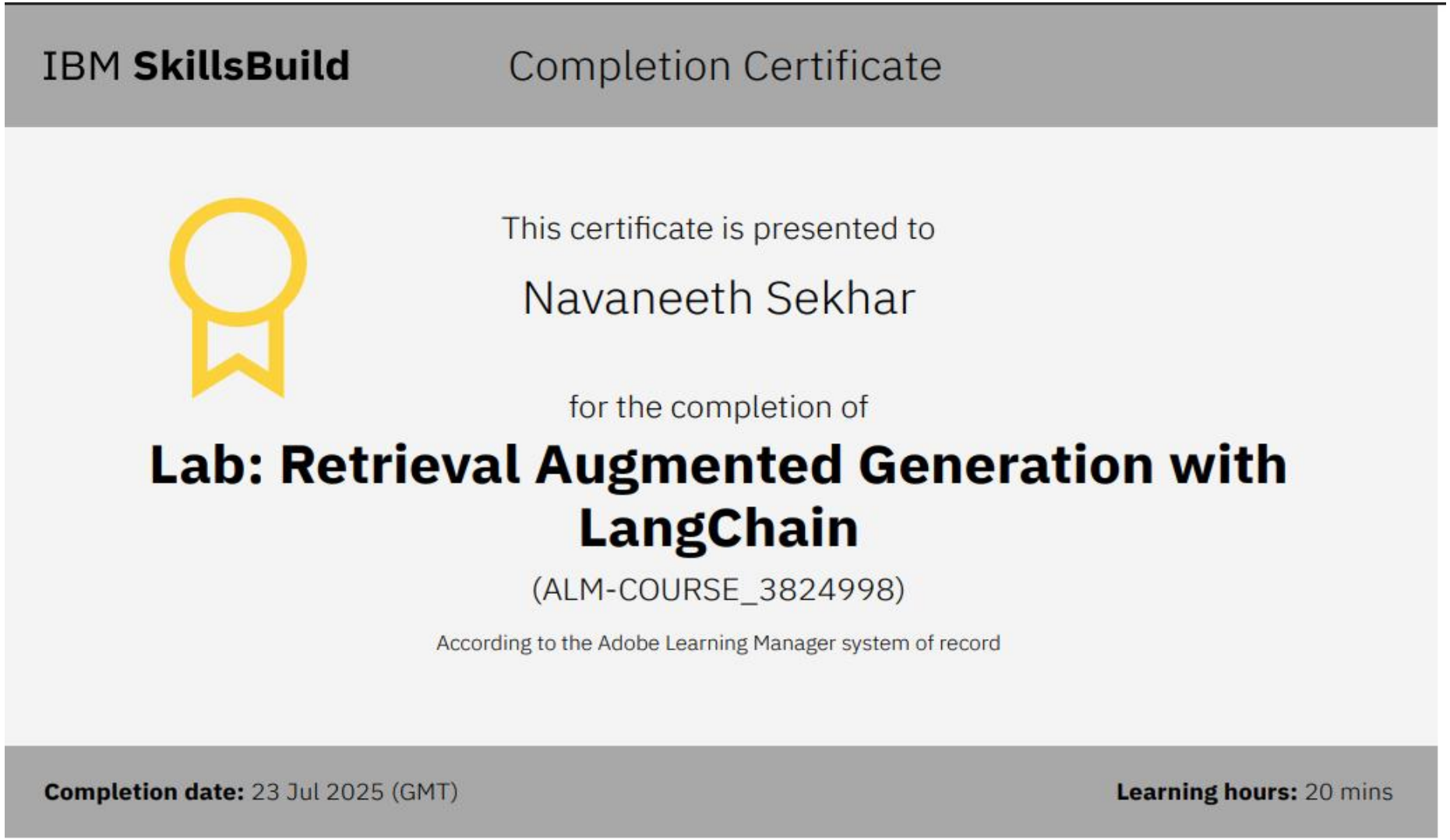
IBM CERTIFICATIONS

- Screenshot/ credly certificate(getting started with AI)

IBM CERTIFICATIONS

- Screenshot/ credly certificate(Journey to Cloud)

IBM CERTIFICATIONS



IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Navaneeth Sekhar

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT) **Learning hours:** 20 mins

- Screenshot/ credly certificate(RAG Lab)

THANK YOU

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