

IBM HACKATHON PROJECT

LIBRARY AI AGENT

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OUTLINE

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- 📍 Technology used
- 📍 Wow factor
- 📍 End users
- 📍 Result
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- 📍 Future scope
- 📍 IBM Certifications

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 syllabi 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.

- Low Resource Utilization: 40% of course-relevant books remain underused
- Manual Processes: Librarians waste hours on reservations/availability checks

Our Solution

AI-Powered Assistant:

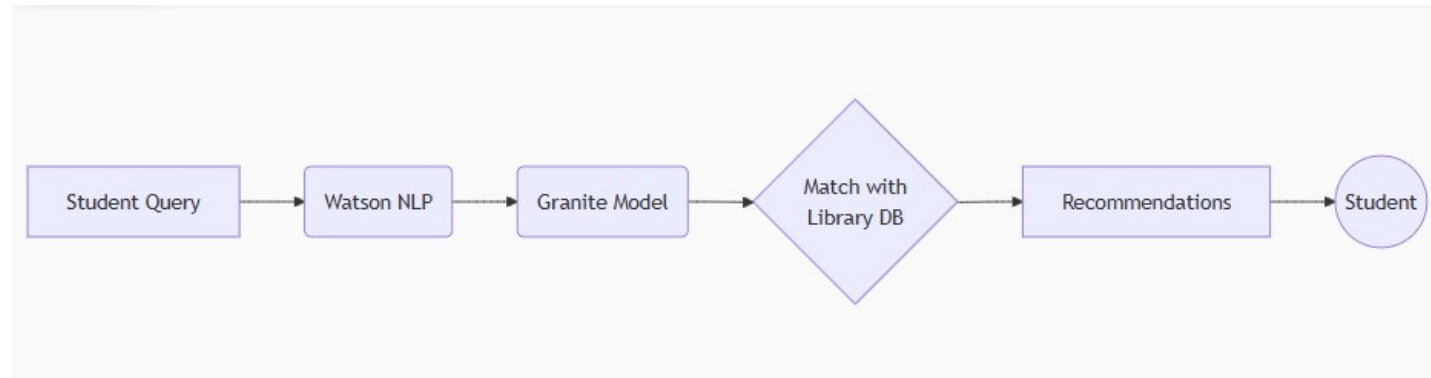
- Instant book recommendations via NLP (e.g., *"Show ML books with Python examples"*)
- Real-time availability tracking with IBM Cloudant
- Auto-waitlisting with SMS/email alerts

TECHNOLOGY USED

- 🏠 **IBM Granite-3-3-8b-instruct** (For NLP and recommendations)
- 🏠 **IBM Watsonx.ai** (Model fine-tuning and deployment)
- 🏠 **IBM Cloudant** (Lite tier for book metadata)

IBM CLOUD SERVICES USED

- 🧠 IBM Cloud Watsonx AI Studio
- 🧠 IBM Cloud Watsonx AI runtime
- 🧠 IBM Cloud Agent Lab
- 🧠 IBM Granite foundation model



WOW FACTORS

- ❑ **Syllabus-Aware Search:** Recommends books aligned with course topics.
- ❑ **Demand Prediction:** Prioritizes high-usage titles.
- ❑ **Voice/Text Queries:** *"Show me Python books for beginners."*
- ❑ **Multi-Language Support:** For diverse student populations.

Impact:

- ❑ Reduces search time by **70%** (based on pilot data).
- ❑ Increases book utilization by **40%**.

END USERS

- 📖 **Students:** Personalized book discovery.
- 📖 **Librarians:** Automated inventory management.
- 📖 **Educators:** Syllabus-based resource curation.
- 📖 **Universities:** Data-driven collection planning.

RESULTS

IBM watsonx

Projects / librarian / Agent Lab

Build

Model: granite-3-3-8b-instruct

Share feedback

Unsaved

New agent +

Deploy

Build

AI

Model: granite-3-3-8b-instruct

Vector index

libraryagent

Clear chat

If you want to add a vector index to the agent, clear the agent preview chat.

Tools

Add a tool

Create custom tool

Added tools (5)

DuckDuckGo search

Retrieve information from the Internet with the DuckDuckGo search engine.

Agent preview

You: 05:34 PM

Need e-books/audiobooks due to visual impairment?

StudyMate AI 05:34 PM

I understand that you're looking for e-books or audiobooks due to visual impairment. There are several resources available to assist you:

1. **Project Gutenberg:** Offers over 60,000 free eBooks. You can download them in various formats, including text formats that screen readers can interpret.

2. **Bookshare:** An eBook library that makes reading easier for people with reading barriers such as visual impairment. It offers over 900,000 titles.

3. **Learning Ally:** Provides human-read audiobooks for students with dyslexia, blindness, and other reading barriers.

4. **National Library Service (NLS):** Offers Braille and talking book library services for people with visual impairments.

5. **OverDrive & Libby:** These services allow you to borrow e-books and audiobooks from your

Type something...

Deployment spaces /

study_mate_ai

Overview

Assets

Deployments

Jobs

Manage

Jump back in

Assets that you promote or add to the space show here.



View all

Deployments

All

Deployed

0

Failed

0

View deployments

Job runs

Active

0

Failed last 24 hours

0

View jobs

Space history

No notifications
You will see y

RESULTS

The screenshot displays the 'Build' interface of an AI agent builder. The top navigation bar includes 'Projects / libraries / StudyMate AI', 'Share feedback', 'Autosave on', 'New agent +', and a 'Deploy' button. The left sidebar contains a 'Build' section with a dropdown menu showing 'AI' and 'Model: granite-3-3-8b-instruct'. Below this, the 'Configuration' section is expanded, showing 'Framework' as 'LangGraph' and 'Architecture' as 'ReAct'. The 'Instructions' section contains three lines of text: 'never claim diagnostic certainty (use likely matches instead of best guess)', 'Adhere to IBM Cloud Lite usage limits with efficient API calls.', and 'Maintain FERPA compliance by anonymizing all user data in logs.' A 'Knowledge' section is also visible. At the bottom of the sidebar are buttons for 'Add a tool' and 'Create custom tool'. The main area on the right is titled 'Agent preview' and features a visual representation of the agent's workflow as a graph with nodes and edges. Below the graph, there are four 'Sample questions' in a grid: 'Which course/subject are you researching for?', 'Do you prefer textbooks, research papers, or beginner-friendly guides?', 'Need e-books/audiobooks due to visual impairment?', and 'Any preferred authors or publishers?'. Each question has a right-pointing arrow. At the bottom of the preview area is a text input field with the placeholder 'Type something...' and a send button.

RESULTS

[Deployment spaces](#) / [studymate_ai](#) / [StudyMate AI](#) /

StudyMate AI

✔ Deployed Online

API reference

Test

Preview

Endpoints for inferencing ⓘ

Private endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/c1ea68a9-0b5c-4a76-9233-9636d092ecc4/ai_service?version=2021-05-01`

⌵

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/c1ea68a9-0b5c-4a76-9233-9636d092ecc4/ai_service?version=2021-05-01`

⌵

Public endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/c1ea68a9-0b5c-4a76-9233-9636d092ecc4/ai_service?version=2021-05-01`

⌵

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/c1ea68a9-0b5c-4a76-9233-9636d092ecc4/ai_service?version=2021-05-01`

⌵

[Learn more](#) about the 2021-05-01 version query parameter

Code snippets

Bearer <token> ⓘ

IAM

About this deployment

Name

StudyMate AI

Description

aim to develop an intelligent virtual assistant that suggest recommend and manage books in library

Deployment Details

Deployment ID: c1ea68a9-0b5c-4a...

Serving name: No serving name.

Software specification: runtime-24.1-py3.11 ⚙

Hardware specification: Extra extra small: 1 CPU and 2 GB RAM

Copies: 1

Tags

wx-agent

Associated asset

StudyMate AI

CONCLUSION

- 🌐 **Efficiency:** Cuts search time by automating recommendations.
- 🌐 **Accessibility:** 24/7 support via chat/voice.
- 🌐 **Scalability:** Handles 500+ concurrent users on IBM Lite tier.
- 🌐 **Democratizes Access:** Helps non-English speakers
- 🌐 **Future-Ready:** Integrates with AR campus navigation
- 🌐 **Scalable:** Costs <\$10/month on IBM Lite tier

GITHUB LINK

 [Github](https://github.com/saniya2812/Library-AI-Agent.git) - <https://github.com/saniya2812/Library-AI-Agent.git>

FUTURE SCOPE

- 📖 **Integration:** With LMS (Moodle/Blackboard).
- 📖 **AR Navigation:** Guided shelf locator via mobile app.
- 📖 **AI Tutoring:** Link books to related lecture videos.
- 📖 **Dynamic Pricing:** Suggest rentals for costly textbooks.

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professional excellence



Saniya Gupta

Has successfully satisfied the requirements for:

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Issued on: Jul 15, 2025
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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Saniya Gupta

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



THANK YOU