
CAPSTONE PROJECT

LIBRARY AI AGENT

Presented By: Aayush Manish Zarkar

Student name : Aayush Manish Zarkar

College Name & Department : MIT ACADEMY OF ENGINEERING (ENTC)

OUTLINE

- ? **Problem Statement**
- ? **Technology used**
- ? **Wow factor**
- ? **End users**
- ? **Result**
- ? **Conclusion**
- ? **Git-hub Link**
- ? **Future scope**
- ? **IBM Certifications**

PROBLEM STATEMENT

Students often face challenges in quickly locating the most relevant learning materials within large and complex library systems. Manually searching through catalogs, understanding availability, and identifying resources aligned with their academic needs such as course topics, syllabus, or ongoing assignments can be time consuming and inefficient. There is a need for an intelligent solution that can understand student queries in natural language, analyze academic context, and deliver personalized book and resource recommendations. Additionally, the system should support real-time book availability checks, prioritize high-demand materials, and streamline reservation or waitlisting processes. Addressing this challenge would significantly improve access to educational resources, enhance student engagement, and optimize library usage in academic institutions.

TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

IBM CLOUD SERVICES USED

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

WOW FACTORS

- Personalized recommendations based on student profiles, study topics, and course syllabus.
- Understands natural language queries for a smooth and intuitive user experience.
- Real-time checking of book availability, with suggestions for alternate titles if needed.
- Prioritizes high-demand books and assists with reservations or waitlisting.
- Automatically analyzes academic context to provide relevant learning resources.
- Streamlines the search process, saving students valuable time.
- Enhances engagement with academic content through tailored suggestions.
- Continuously improves recommendations by learning from user interactions.

END USERS

- ❑ Academic Researchers
- ❑ Research Institutions and Universities
- ❑ Industry R&D Teams
- ❑ Educators

RESULTS

IBM watsonx

Upgrade ⓘ 🔔 AAYUSH ZARKAR's Account ▾ Dallas ▾ AZ

Projects / LibraryAgen / Library Agent

Share feedback ⓘ Autosave on 📄 ▾ New agent + Deploy 🔒 ⓘ

Build

AI Model: granite-3-3-8b-instruct ▾ 🔗 ⏪

Framework

LangGraph ▾

Architecture

ReAct ▾

Instructions

Advanced configuration

demand items, and offers personalized recommendations. If a requested item is unavailable, the agent should suggest alternatives or offer to reserve or waitlist the book. After presenting results, the agent should confirm any user actions (like reservations) and offer help with additional topics if needed. It should conclude each session politely by saying something like, "Happy studying! Feel free to ask anytime you need help."

Knowledge

▾

Tools

▴

Add a tool


Create custom tool

Added tools (5)

Google search 🔗 🗑

Retrieve information from the internet with the Google search engine.

Agent preview



Sample questions

"Suggest books for my semester 3 electronics subjects." →

"Suggest reference books for computer networks." →

"Are there any available books on Python programming?" →

"Can you recommend books for machine learning?" →

Type something... 🔗 🔍

RESULTS

[Projects](#) / [LibraryAgen](#) / [Library Agent](#)

[Share feedback](#)

Autosaved 11:17 AM

New agent +

Deploy

Build > Agent preview

AZ

You: 11:17 AM

suggest me some Machine learning books

Library Agent 11:17 AM

Hi, I am your Library AI Agent. How can I assist you in finding the right learning material today? Based on your query, here are some highly recommended Machine Learning books:

1. "Machine Learning" by Tom Mitchell
2. "Pattern Recognition and Machine Learning" by Christopher M. Bishop
3. "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" by Aurélien Géron
4. "The Elements of Statistical Learning" by Trevor Hastie, Robert Tibshirani, and Jerome Friedman
5. "Deep Learning" by Ian Goodfellow, Yoshua Bengio, and Aaron Courville

Please let me know if you need more information on any of these books or if you're interested in resources for a specific aspect of machine learning.

► How did I get this answer?

Type something...


QUICK START QUESTION PREVIEW


Projects / LibraryAgen / Library Agent


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


Quick start questions


Add up to 4 quick start questions that your users can select. +

"Suggest books for my semester 3 electronics subjects." 

"Suggest reference books for computer networks." 

"Are there any available books on Python programming?" 

"Can you recommend books for machine learning?" 

Configuration 

Framework Architecture

TOOLS USED AND TESTING

[Projects](#) / [LibraryAgen](#) / Library Agent

Build

AI

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

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Added tools (5)

Google search

Retrieve information from the internet with the Google search engine.

DuckDuckGo search

Retrieve information from the internet with the DuckDuckGo search engine.

Wikipedia search

Retrieve information from Wikipedia articles.

Webcrawler

Retrieve information from a website.

Weather

Retrieve the weather of a city.

edunet
foundation

RESOURCES LIST

IBM Cloud

Search resources and products...

Catalog Manage AAYUSH ZARKAR's Acc...

Resource list

Create resource +

Name	Group	Location	Product	Status	Tags
Filter by name or IP address... Filter by group... Filter... Filter... Filter...					
Storage (1)					
CloudObjectStorage	Default	Global	Cloud Object Storage	Active	cpdaas
Converged infrastructure (0)					
Enterprise applications (0)					
AI / Machine Learning (2)					
watsonx.ai Runtime-ss	Default	Dallas (us-south)	watsonx.ai Runtime	Active	cpdaas
watsonx.ai Studio-9h	Default	Dallas (us-south)	watsonx.ai Studio	Active	—
Analytics (0)					
Blockchain (0)					
Databases (0)					
Developer tools (0+)					
Observability (0)					

RESULTS

IBM watsonx

Upgrade ?

AAYUSH ZARKAR's Account

Dallas

AZ

Projects / LibraryAgen / Library Agent


Share feedback

Autosave on

New agent +

Deploy

Build > Agent preview



Sample questions

"Suggest books for my semester 3 electronics subjects." →

"Suggest reference books for computer networks." →

"Are there any available books on Python programming?" →

"Can you recommend books for machine learning?" →

Type something...

CONCLUSION

- Enhances the traditional library experience using AI-powered assistance
- Understands academic needs through natural language processing
- Delivers personalized and relevant learning material recommendations
- Checks real-time book availability and assists with reservations
- Streamlines the search process, saving time for students and faculty
- Increases engagement and efficient utilization of library resources
- Supports academic success through smarter access to study materials

FUTURE SCOPE

- Integration with voice assistants for hands-free book searches
- Multilingual support using language translation models for diverse users
- Integration with external digital libraries and academic databases
- Personalized learning paths based on student behavior and progress
- Mobile app version for easy access on the go
- AI-based notifications for new arrivals or books related to ongoing courses
- Offline access to saved reading lists and summaries
- Feedback-driven improvement of recommendations using machine learning

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



AAYUSH ZARKAR

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 19, 2025
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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

AAYUSH ZARKAR

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

GITHUB LINK

❑ Github Link :- <https://github.com/AAYUSH1612/Project-Ai>



THANK YOU