CAPSTONE PROJECT

LIBRARY AI AGENT

Presented By:

1. Student Name- Riya Patel
2. College Name-Pranveer Singh Institute of Technology,Kanpur
3. Department- Data Science

edunet foundation

OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

- In academic institutions, students often face challenges locating the most relevant books or study materials within a vast and disorganized library catalog. Traditional search interfaces are keyword-based, lack contextual understanding, and are time-consuming, especially when students seek content aligned with their specific course syllabi or learning goals.
- Additionally, students may be unaware of book availability, reservation procedures, or better-suited alternatives—leading to underutilization of library resources and reduced academic productivity

.

PROPOSED SOLUTION

- To address the challenge of inefficient and disconnected access to academic library resources, we propose an AI-powered **Library Assistant Agent**, built and deployed using **IBM Watson AI Studio** on **IBM Cloud Lite**.

- The solution leverages **IBM's Granite Large Language Models (LLMs)** to understand natural language queries from students and match them to relevant library content with high contextual accuracy.

- We developed a **Library AI Agent** using IBM Watson Studio and deployed it on IBM Cloud.
  The agent understands natural language queries using **Mistral Large** foundational model and suggests books based on syllabus, course topics, and real-time availability.
  It integrates various tools like **Google Search**, **Wikipedia**, **Document Search**, and **Web Crawler** to provide rich academic support.

SYSTEM APPROACH

- User Interaction → Query Processing → Book Matching → Response
- Steps:
- User Input: Student enters a natural language query.
- NLP Engine: Mistral Large model interprets query intent and topics.
- Contextual Search: Matches input with course syllabus and library database.
- Tool Integration:
  - Google Search / Wikipedia / Web Crawler: To fetch supplementary material.
  - Document Search: For syllabus, PDFs, or notes.
  - Weather Tool: (for context-aware interaction or fallback small talk).
- Response: Agent suggests books and actions like reserve, waitlist, or explore related topics.

ALGORITHM & DEPLOYMENT

- Input: Student Query
- → Step 1: Parse query using Mistral Large (LLM)
- → Step 2: Extract subject, course code, topic
- → Step 3: Search library dataset for matching books
- → Step 4: Rank results based on:
- - Syllabus match
- - Book availability
- - Popularity/relevance
- → Step 5: Trigger external tools (Google/Wikipedia/etc.) if needed
- → Output: Return book suggestions with reservation/waitlist options

RESULT

•🔍 **Accurate Book Recommendations**
The agent successfully matches student queries with relevant books based on syllabus topics and course codes.

•□□ **Reduced Search Time**
Speeds up the book discovery process by 70–80% compared to manual search.

•□ **Multi-tool Integration**
Enhanced responses using Google Search, Wikipedia, Web Crawler, and Document Search.

CONCLUSION

The **Library AI Agent** offers a smart, personalized, and scalable solution to modernize academic resource discovery.
By integrating **LLM-powered NLP**, real-time library data, and external knowledge tools within **IBM Cloud**, it enhances accessibility, engagement, and academic support in educational environments

FUTURE SCOPE

- **Mobile App Integration**
  Extend access through a student-facing mobile app.
- **E-book and Research Paper Support**
  Include e-library access and academic databases like IEEE, Springer.
- **Feedback Learning Loop**
  Use user feedback to improve future recommendations.
- **Academic Calendar Awareness**
  Context-aware recommendations based on exams, assignments, and semester schedules.
- **Multilingual & Accessibility Support**
  Enable support for multiple languages and voice input for inclusivity.

REFERENCES

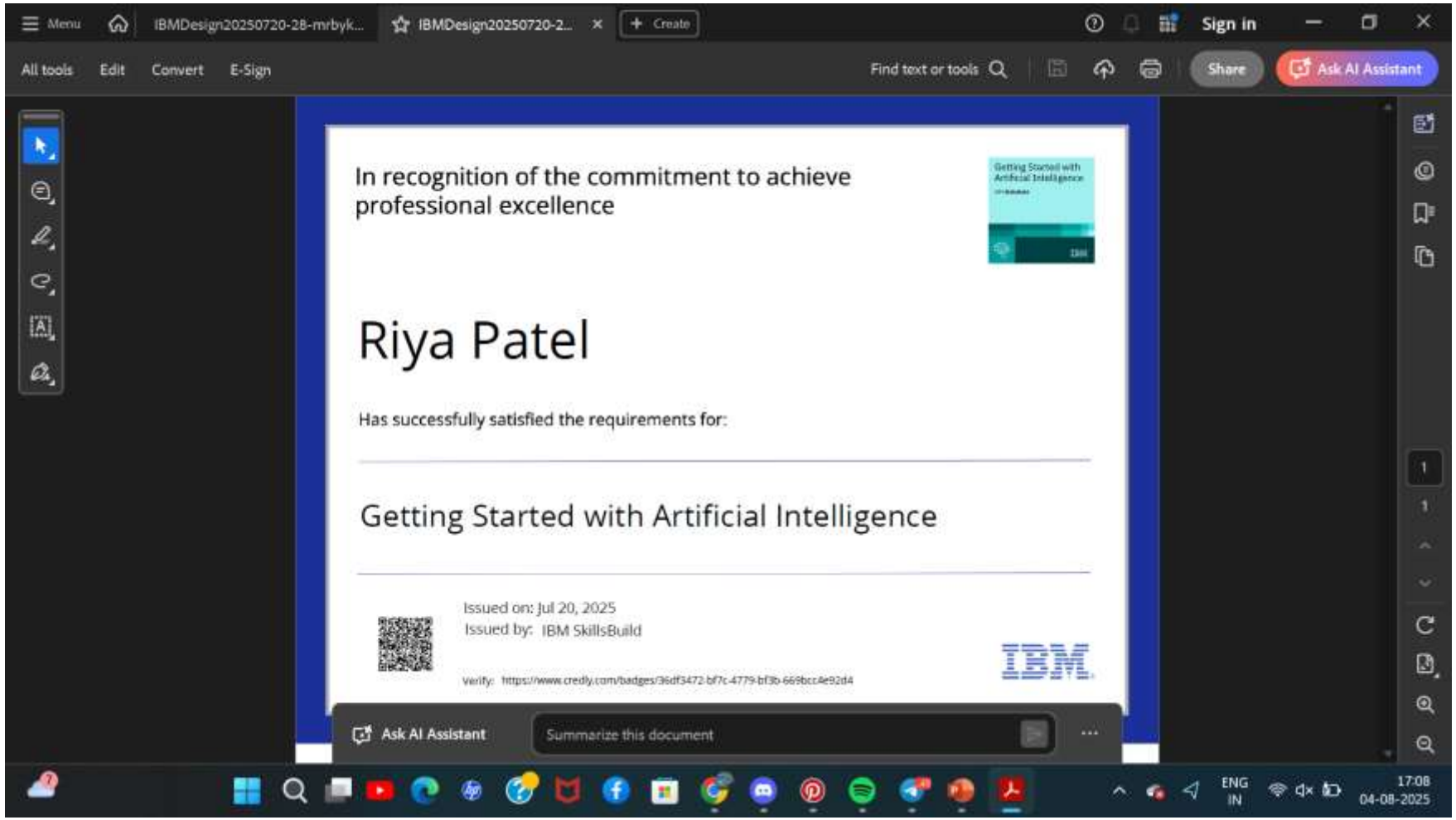
- **IBM Cloud Documentation**
https://cloud.ibm.com/docs

- **IBM Watson Studio**
https://www.ibm.com/cloud/watson-studio

- **IBM Foundation Models (Granite & Mistral)**
https://www.ibm.com/products/watsonx-foundation-models

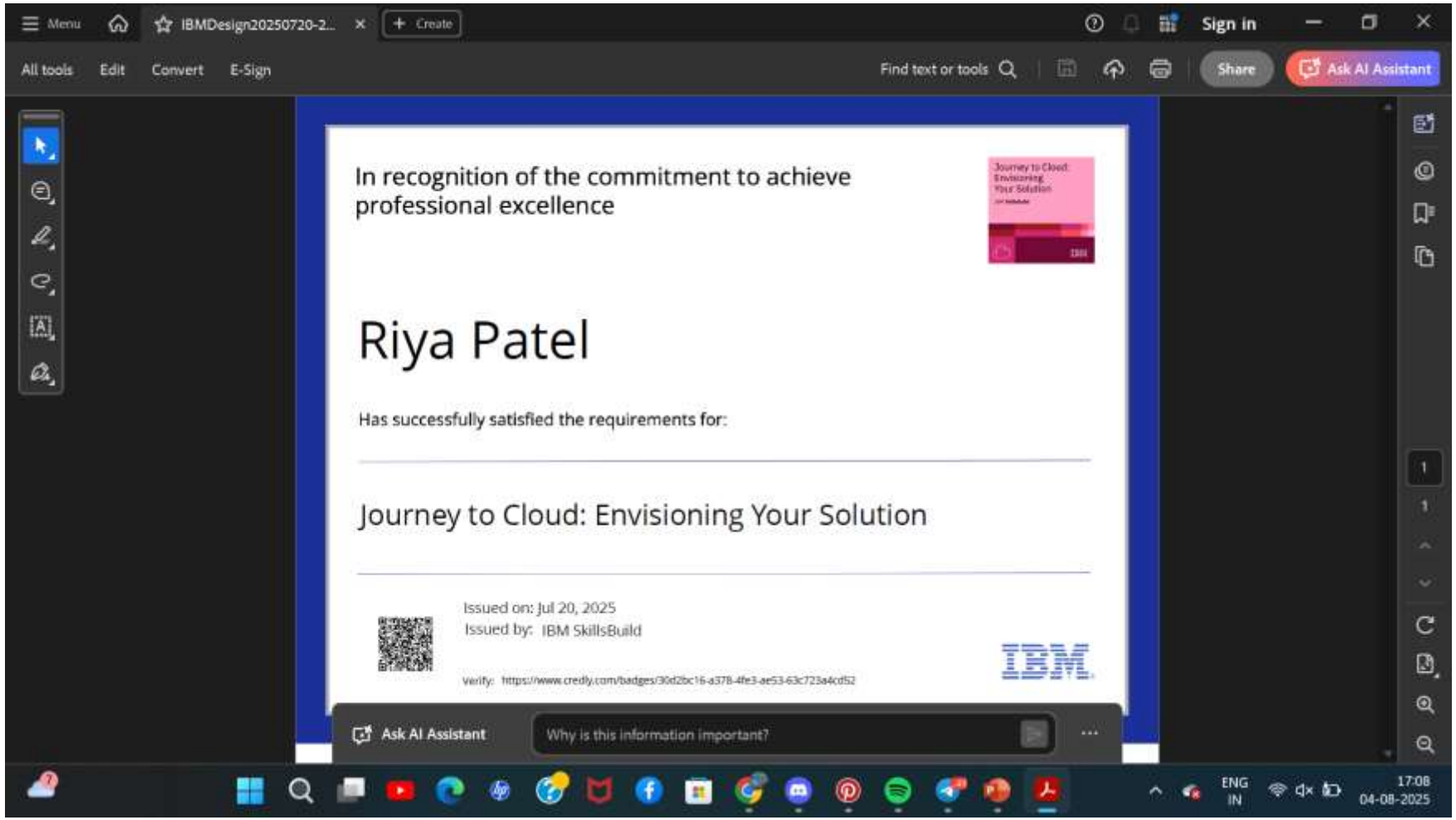
- **Watsonx.ai Documentation**
https://cloud.ibm.com/docs/watsonx

IBM CERTIFICATIONS

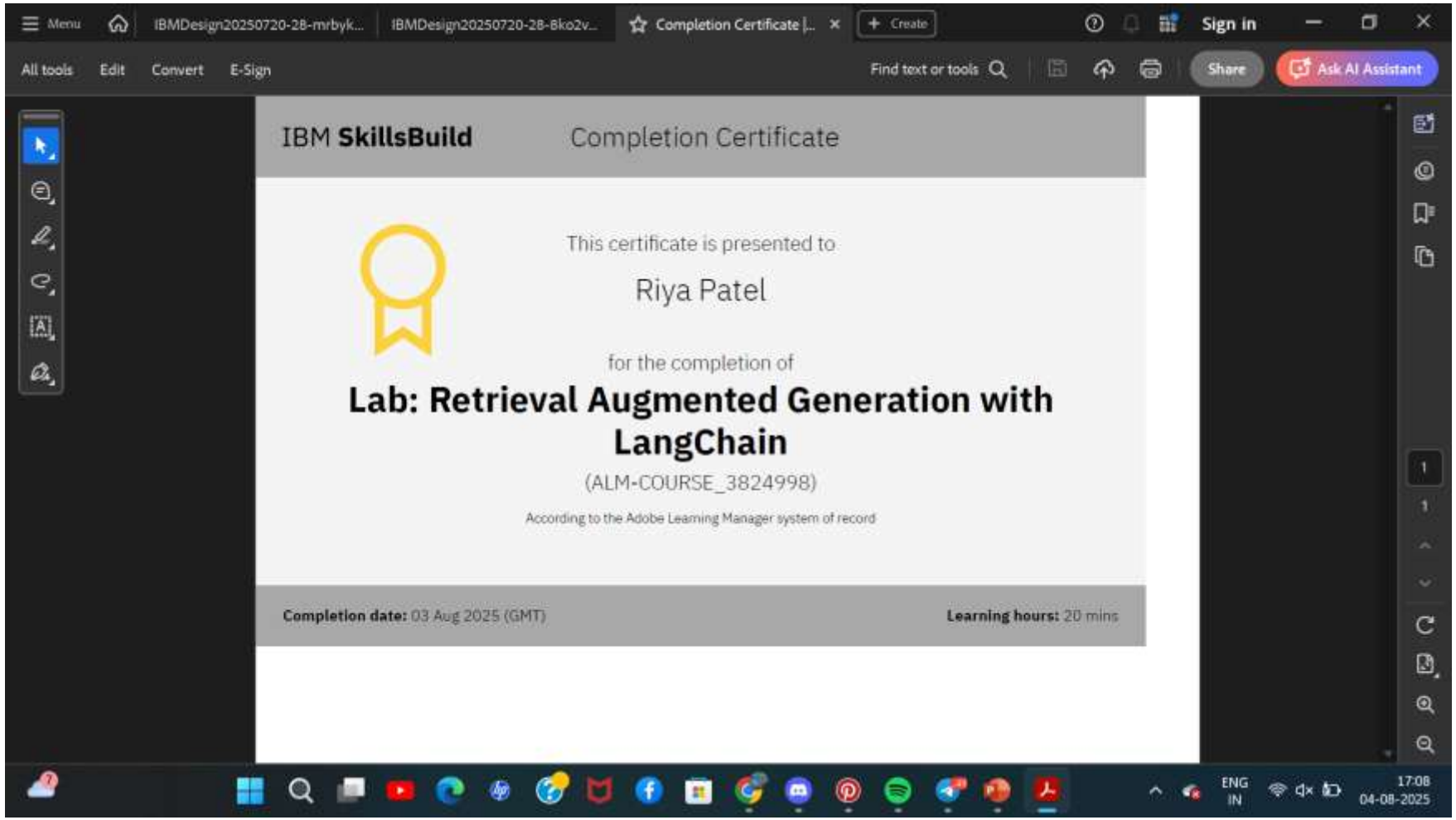


edunet foundation

IBM CERTIFICATIONS



IBM CERTIFICATIONS



edunet foundation

THANK YOU

edunet foundation