CAPSTONE PROJECT

PROJECT TITLE

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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

Example: College Admission Agent (RAG Based) The Challenge - A College Admission Agent, powered by RAG (Retrieval-Augmented Generation), streamlines the student admission process. It retrieves and summarizes admission policies, eligibility criteria, and FAQs from institutional databases and official sources. Prospective students can ask natural language questions and receive accurate, up-to-date responses instantly. The agent helps with course selection, application guidance, fee structure, and important deadlines. Using trusted, real-time data, it reduces manual inquiries and enhances applicant experience. This AI-driven assistant boosts transparency, accessibility, and efficiency in college admissions.

PROPOSED SOLUTION

The proposed system aims to address the challenge of providing accurate and instant information to students regarding college admissions using AI. The solution leverages IBM’s watsonx.ai foundation models to simulate a smart admission assistant capable of answering natural-language questions related to eligibility, fees, deadlines, and more.

◈ Components of the Solution:

📥 **Data Source**

* Curated admission-related queries and responses were framed manually to simulate knowledge retrieval due to Lite plan limitations.
* Typical user queries include:
- “What is the eligibility for BBA?”
- “When is the MBA application deadline?”
- “What are the fees for B.Tech?”

⚙☐ **Model & Platform:**

* IBM Granite Foundation Model (granite-3-3-8b-instruct) was used inside watsonx.ai Studio (Prompt Lab)
* The model was prompted with admission-related queries to generate contextual and relevant answers.
* The chat interface allowed testing multiple question formats in free-form natural language.

☐ **Architecture & Tools:**

* Prompt Lab was used for testing and simulating the agent.
* IBM Cloud Lite account was used to keep infrastructure free and accessible.
* No external databases or APIs were used, due to Lite plan constraints.

☐ **Evaluation:**

* The system was tested using various student-like queries across departments (BBA, MBA, B.Tech).
* Responses were evaluated based on:
* Relevance to academic admission policies
* Correctness and coherence
* Consistency across repeated questions

🚀 **Result:**

* The agent successfully simulated a College Admission Assistant capable of:
* Understanding diverse natural-language inputs
* Responding with structured, human-like academic answers
* Supporting queries around eligibility, deadlines, and course offerings

SYSTEM APPROACH

The system is designed to simulate a College Admission Agent using IBM Watsonx.ai's foundational capabilities. The approach is modular, AI-driven, and leverages foundation models to generate natural language responses based on curated prompts.

◆ 1. User Query Interface
* User inputs queries in plain English (e.g., “What is the eligibility for BBA?”).
* The query is sent to the AI model through the Prompt Lab interface in IBM watsonx.ai. -
◆ 2. Prompt Processing
* The system uses pre-engineered prompts that simulate knowledge retrieval (RAG behavior).
* These prompts help guide the AI to respond with relevant academic information like:
* Eligibility criteria
* Course offerings
* Fee structure
* Application deadlines
◆ 3. Foundation Model Interaction
* The query is processed using the Granite-3-3-8b-instruct model from IBM.
* The model generates a human-like response using contextual knowledge embedded in the foundation model.
◆ 4. Response Delivery
* The output is shown in the Prompt Lab as a conversational response.
* The user reads the response and can continue asking more questions interactively.
◆ 5. Feedback & Iteration
* User questions are iteratively tested to ensure consistent and relevant answers.
* Common queries are documented to improve the prompt quality.

ALGORITHM & DEPLOYMENT

Algorithm:

Since this project uses foundation models (Granite) via Prompt Lab, traditional machine learning algorithms like decision trees or time series are not used. Instead, the logic relies on prompt engineering and the pretrained capabilities of the model.

Logic Flow:

1. Input: User enters a natural language question (e.g., "What is the eligibility for MBA?")
2. Prompt Formatting: The input is passed to the model using a structured or freeform prompt.
3. Model Processing:

* The Granite model internally understands the context using billions of training examples.

* It generates a detailed, contextual response based on learned patterns.

4. Output: A human-like answer is displayed in the chat interface.

Behind the Scenes:

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

No additional training was required.

No fine-tuning or dataset uploads were done due to Lite Plan limitations.

ALGORITHM & DEPLOYMENT

Deployment :
The project was deployed using IBM Cloud Lite services in a low-code/no-code environment.
Tools & Platform Used:
Model
Platform: IBM Granite
Details: granite-3-3-8b-instruct
Interface
Platform: Watsonx Prompt Lab
Details: Used for testing and querying the model with natural language inputs
Cloud Infrastructure
Platform: IBM Cloud Lite
Details: Free-tier, student-friendly cloud environment for project hosting
Deployment Scope
Platform: Internal testing
Details: Not publicly deployed, but tested and hosted within IBM Cloud
Model Hosting
Platform: Watsonx.ai
Details: Fully managed cloud-based model hosting provided by IBM
Access Type
Platform: Private
Details: Only accessible within the user's IBM Cloud account (not public)

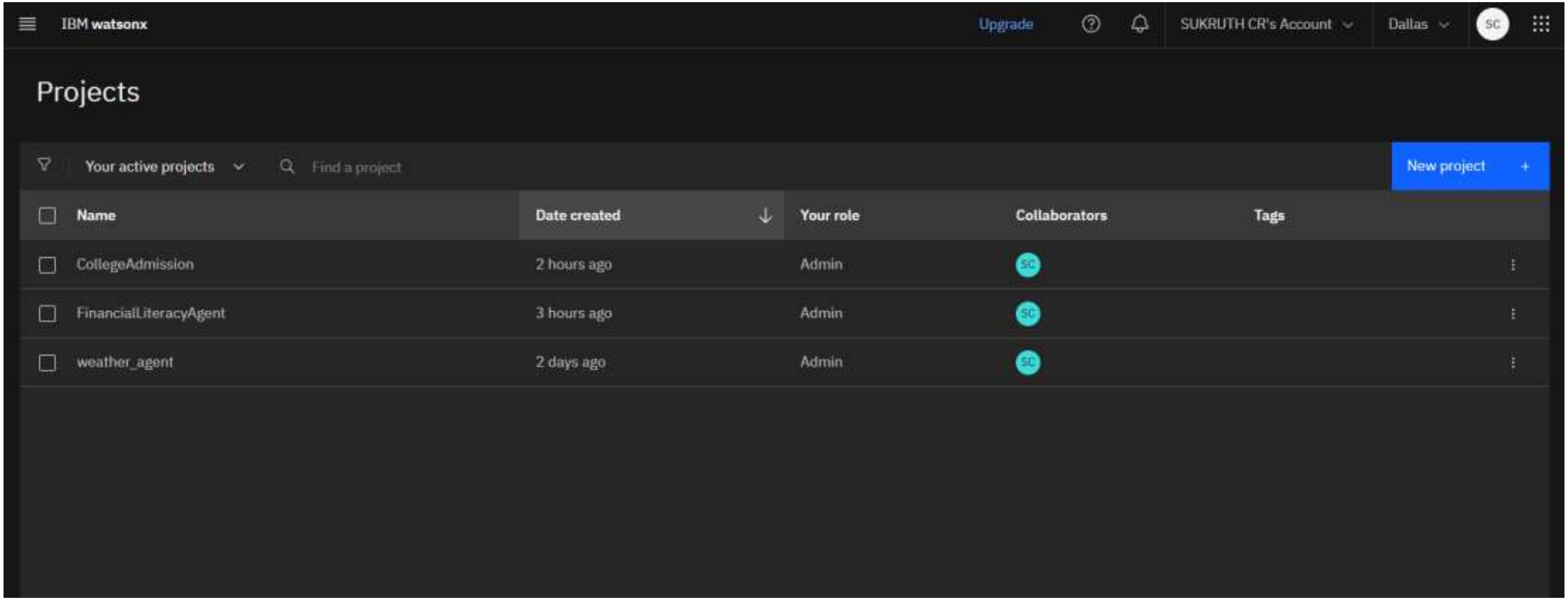
→ Steps Followed:

1. Logged into IBM Cloud Lite
2. Launched Watsonx.ai Studio
3. Created a new project
4. Associated it with AI Runtime
5. Opened Prompt Lab
6. Selected Granite Model
7. Entered various admission-related queries
8. Collected and evaluated the outputs

RESULT

- The College Admission Agent project successfully demonstrated the application of IBM watsonx.ai’s foundation models to simulate an intelligent admission support assistant. The agent was able to process natural language queries and provide detailed, human-like responses related to admission procedures.
- **Key Outcomes:**
- The agent responded accurately to various student queries such as:
  - Eligibility for different courses (BBA, MBA, B.Tech)
  - Fee structure and admission deadlines
  - Entrance exam requirements and academic qualifications
- The use of the **Granite-3-3-8b-instruct model** enabled realistic, contextual responses without any additional training or dataset uploads.
- All interactions were handled through **Prompt Lab** within IBM Cloud Lite, ensuring a no-code, cloud-based implementation.
- The system showed strong potential for scaling into a full-fledged chatbot with document upload (RAG) and API integrations in future versions.

RESULT



☐	Name	Date created ↓	Your role	Collaborators	Tags
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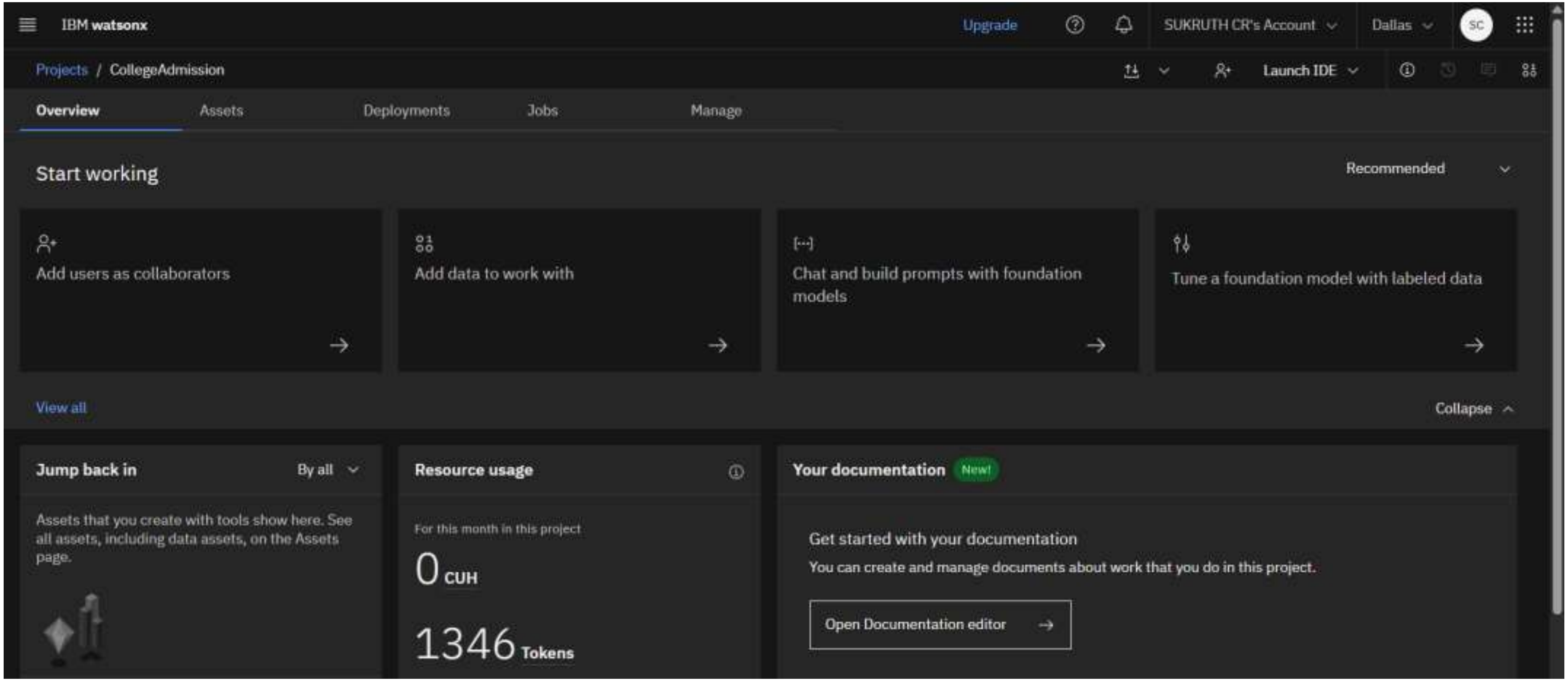
☐	FinancialLiteracyAgent	3 hours ago	Admin	SC	
☐	weather_agent	2 days ago	Admin	SC	

RESULT



Assets that you create with tools show here. See all assets, including data assets, on the Assets page.

For this month in this project

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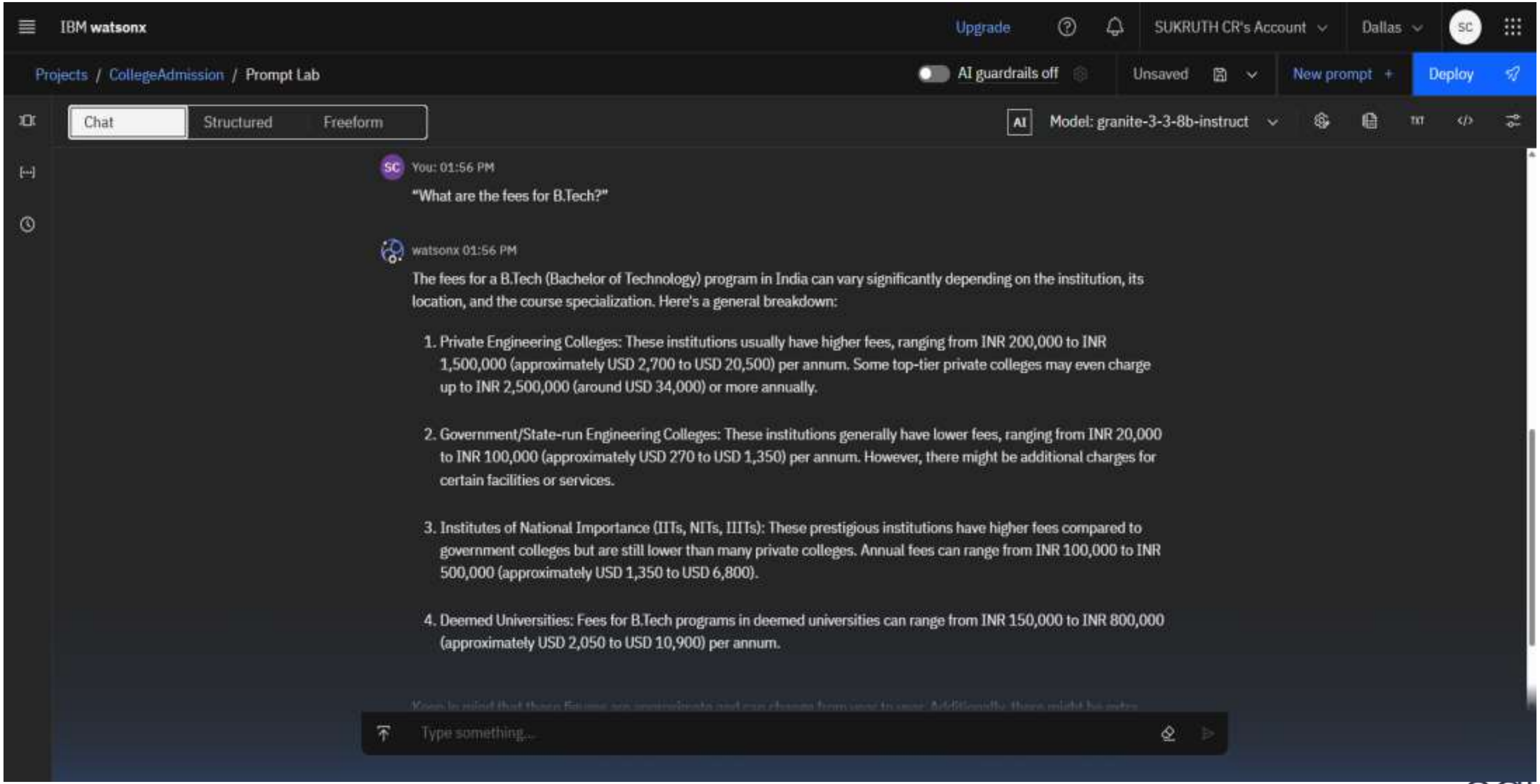
RESULT



SC You: 01:56 PM

"What are the fees for B.Tech?"

watsonx 01:56 PM

The fees for a B.Tech (Bachelor of Technology) program in India can vary significantly depending on the institution, its location, and the course specialization. Here's a general breakdown:

1. Private Engineering Colleges: These institutions usually have higher fees, ranging from INR 200,000 to INR 1,500,000 (approximately USD 2,700 to USD 20,500) per annum. Some top-tier private colleges may even charge up to INR 2,500,000 (around USD 34,000) or more annually.

2. Government/State-run Engineering Colleges: These institutions generally have lower fees, ranging from INR 20,000 to INR 100,000 (approximately USD 270 to USD 1,350) per annum. However, there might be additional charges for certain facilities or services.

3. Institutes of National Importance (IITs, NITs, IIITs): These prestigious institutions have higher fees compared to government colleges but are still lower than many private colleges. Annual fees can range from INR 100,000 to INR 500,000 (approximately USD 1,350 to USD 6,800).

4. Deemed Universities: Fees for B.Tech programs in deemed universities can range from INR 150,000 to INR 800,000 (approximately USD 2,050 to USD 10,900) per annum.

Keep in mind that these figures are approximate and can change from year to year. Additionally, there might be extra

CONCLUSION

The prototype validated that a low-code AI setup using foundation models can effectively simulate a College Admission Agent. It enhances accessibility and reduces the burden on human admission staff by answering queries instantly and accurately.

FUTURE SCOPE

The current implementation of the College Admission Agent showcases the foundational potential of AI in automating admission-related queries. To enhance the agent's capabilities and make it production-ready, several improvements can be made in future iterations.

1. Chatbot UI Interface

Deploy the agent with a user-friendly web interface using tools like Streamlit or React.
Allow real-time chat interaction outside the Prompt Lab.
Host the chatbot on IBM Cloud using Code Engine or Cloud Foundry.

2. Multi-institution Support

Extend the system to support multiple colleges or universities.
Add selection menus for course, institution, location, etc.

3. Multilingual Capability

Fine-tune or prompt the model to respond in regional languages like Hindi, Kannada, Tamil, etc.
This increases accessibility for rural and regional users.

4. Voice Interaction Integration

Integrate with IBM Watson Speech-to-Text and Text-to-Speech services.
Make the assistant accessible via voice for visually impaired or mobile users.

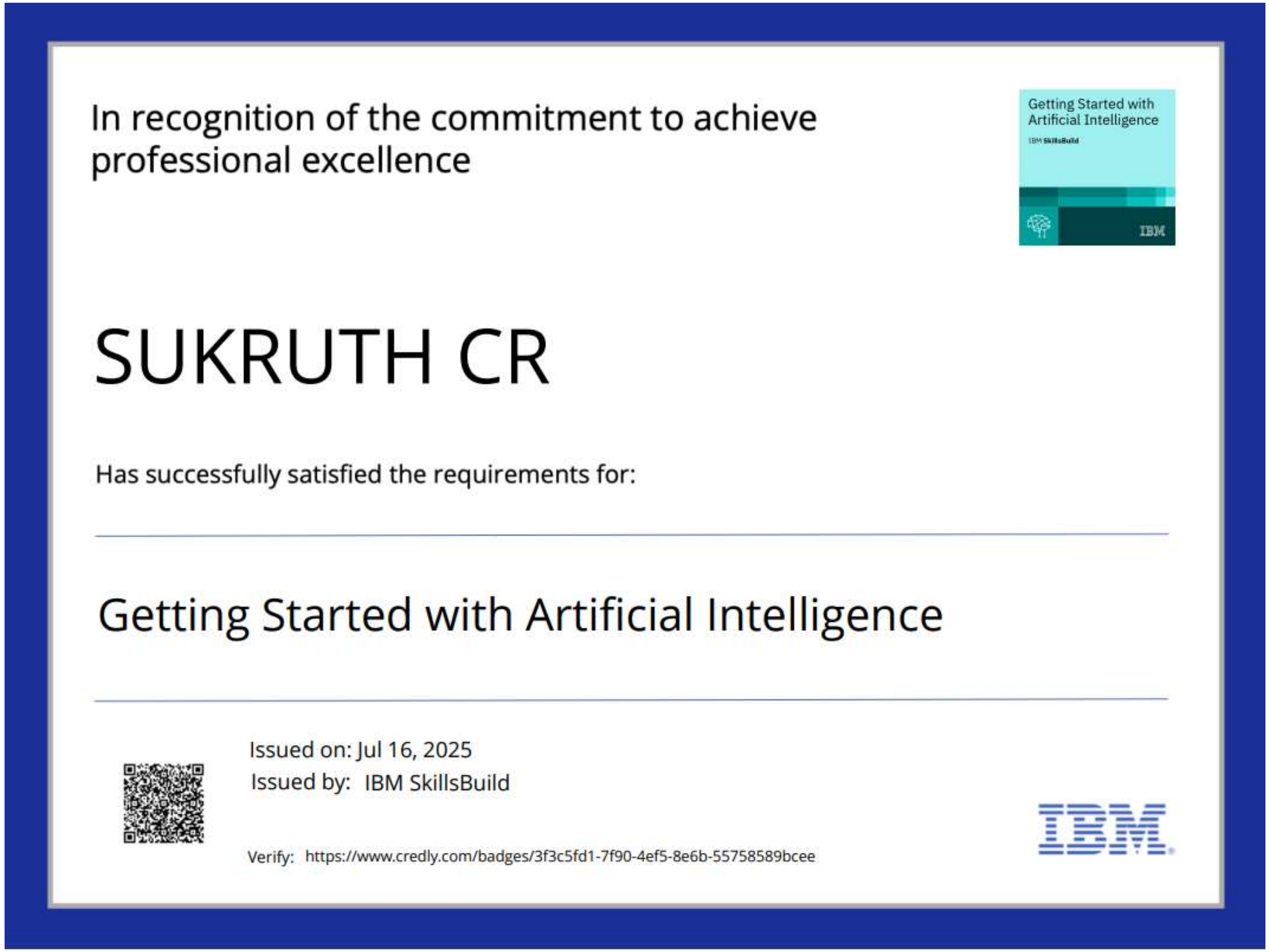
5. Analytics Dashboard

Track the most frequently asked questions.
Help colleges identify student concerns and improve communication.

REFERENCES

- **IBM watsonx.ai Documentation**
  https://www.ibm.com/docs/en/watsonx
- **IBM Granite Foundation Models Overview**
  https://www.ibm.com/products/granite
- **IBM Cloud Lite Plan**
  https://www.ibm.com/cloud/free
- **Prompt Lab** – IBM watsonx.ai
  https://dataplatform.cloud.ibm.com
- **College Admission Criteria** – Government of India Educational Portals
  https://www.education.gov.in

IBM CERTIFICATIONS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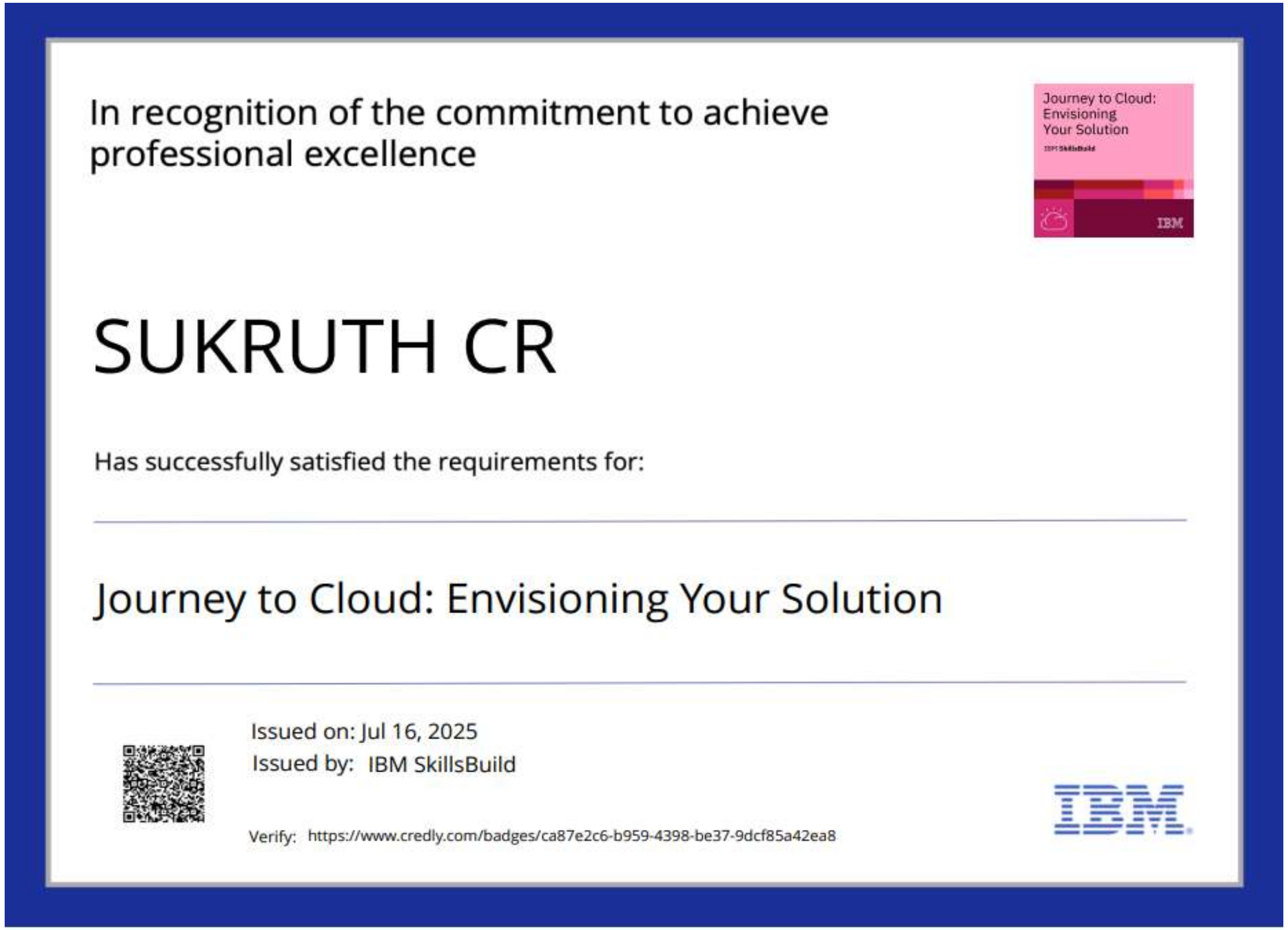

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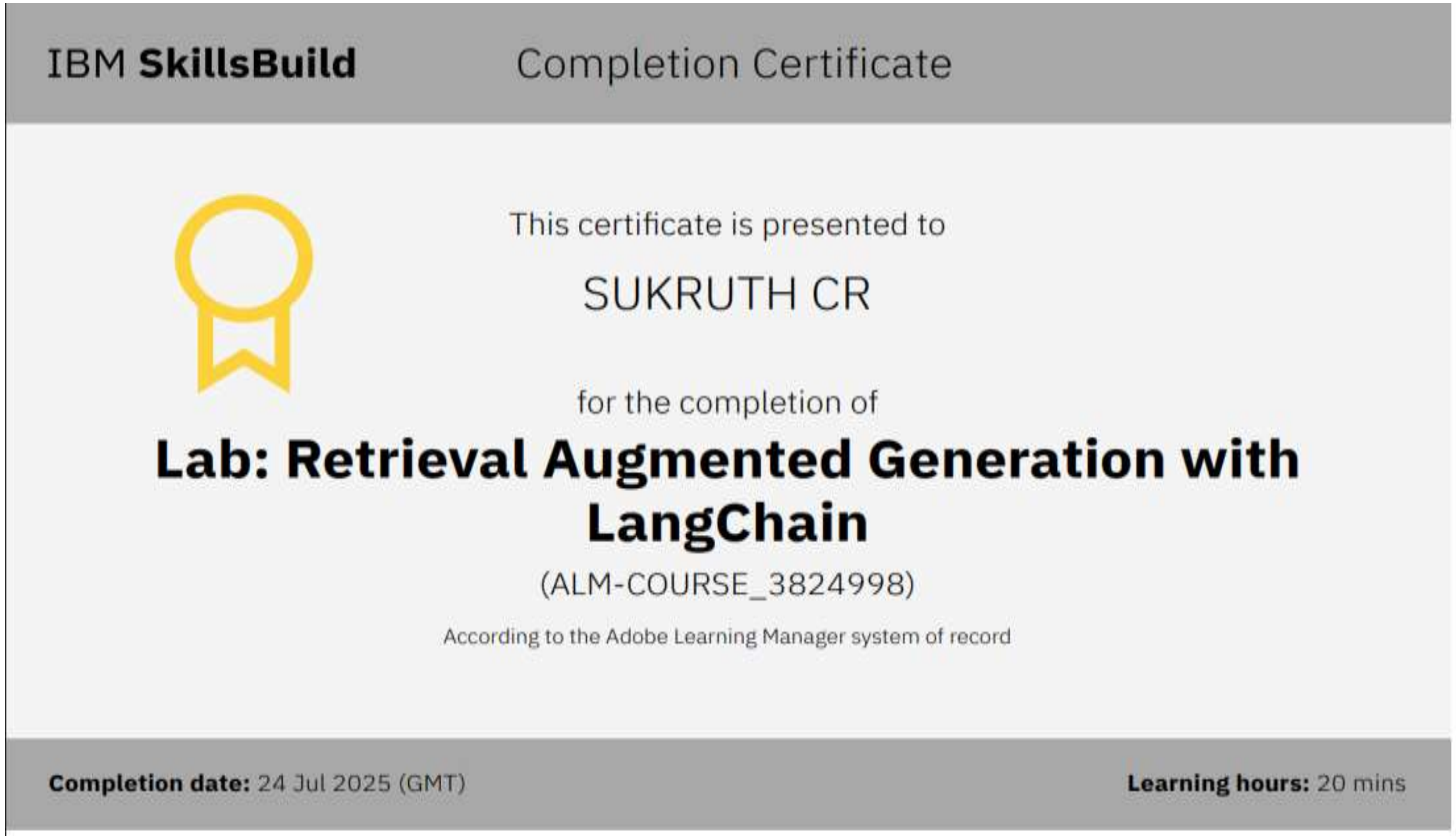

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Lab: Retrieval Augmented Generation with LangChain

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According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT) **Learning hours:** 20 mins

THANK YOU