College Admission AGENT

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Problem Statement

- Students struggle to find reliable and centralized information about colleges, branches, and admission criteria.
- Difficulty in shortlisting colleges based on EAMCET rank, location preferences, and desired branches.
- Lack of personalized counseling leads to confusion and poor decision-making.
- Manual search for cut-off ranks and eligibility details is time-consuming and prone to errors.
- Many students are unaware of all the available options in their rank range and region.
- Inconsistent or outdated data on websites and forums increases uncertainty during admissions.
- No integrated system exists that filters colleges and answers admission-related queries using AI.
- Students face anxiety due to the complex admission process and lack of expert guidance.
- Limited digital solutions are available that provide regional language support or intelligent responses.
- A smart assistant can greatly simplify the admission journey by offering recommendations and clarifying doubts in real-time.

Proposed Solution

- The proposed system assists students in navigating the college admission process by recommending suitable colleges and branches based on their entrance exam rank (e.g., EAMCET), preferred location, and academic marks in key subjects like Maths, Physics, and Chemistry. It uses a dynamic dataset containing district-wise college data, realistic closing ranks, and available seat information to provide accurate suggestions.
- An AI-powered assistant—built using IBM's Granite foundation model and a Retrieval-Augmented Generation (RAG)
- The platform ensures data privacy and security, offers an intuitive Streamlit-based UI where students can register/login, and instantly view personalized recommendations. It is designed to reduce confusion during admissions and can be scaled on IBM Cloud or other infrastructures.

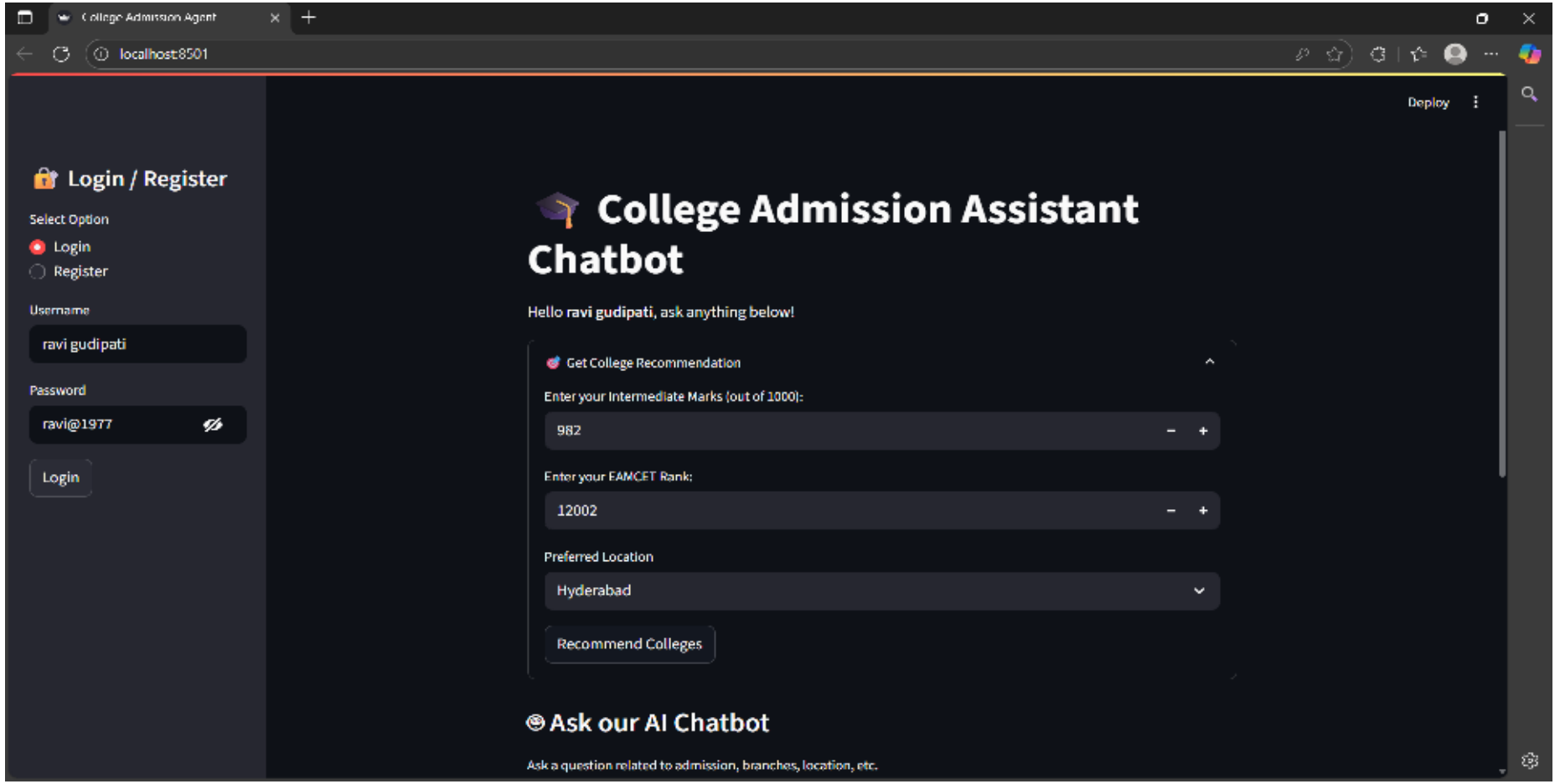
TECHNOLOGY USED

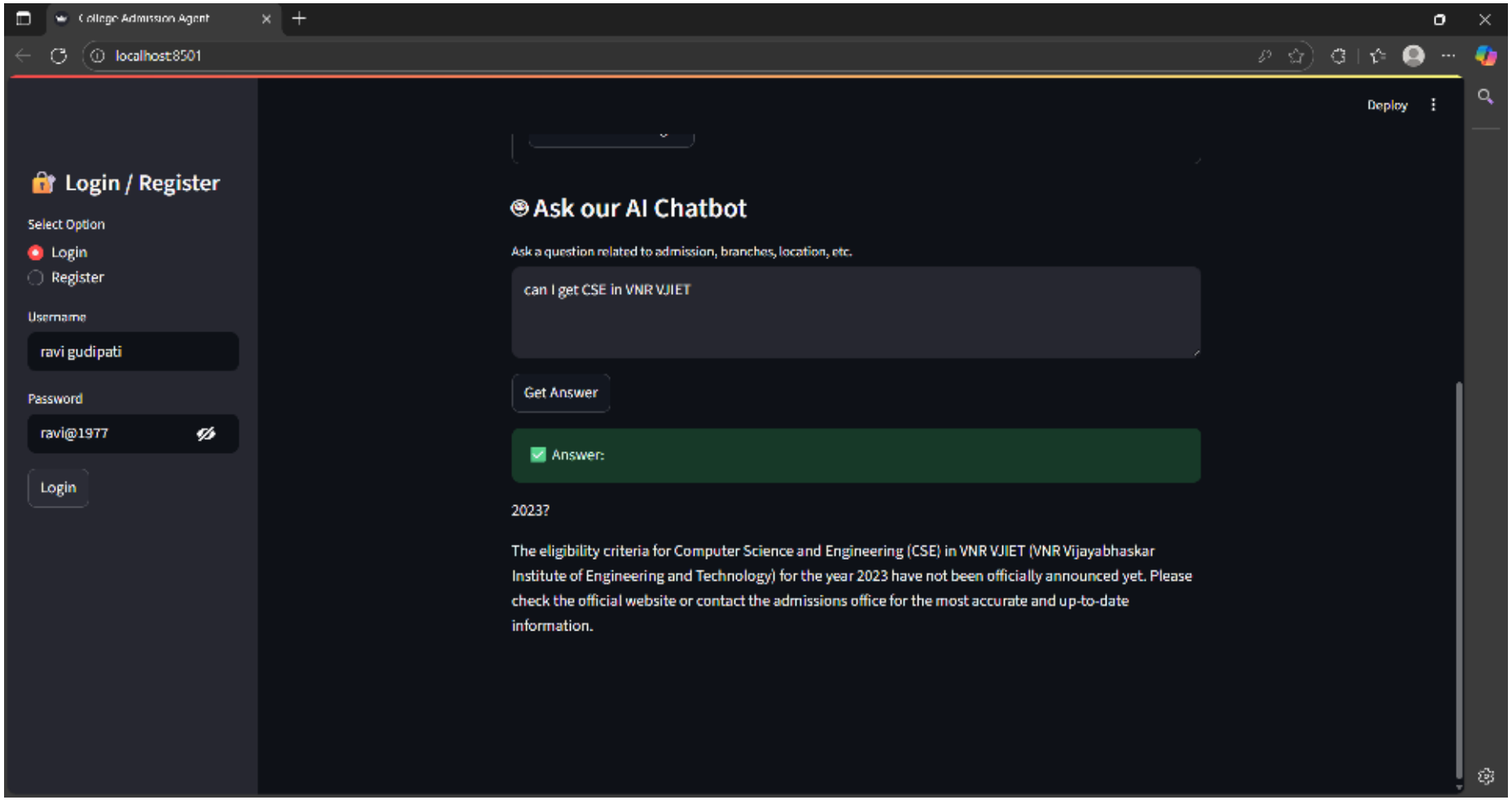
- This project integrates the IBM Watsonx.ai Granite-3-8b-instruct model, hosted in the au-syd region, to build an intelligent college admission assistant. The core functionality uses RAG (Retrieval-Augmented Generation) to combine user queries with contextual data from a colleges.csv dataset containing institute names, branches, locations, and EAMCET closing ranks.
- Based on the user's inputs such as marks, preferred location, or rank the system filters and recommends colleges where the user is eligible.
- The Streamlit interface provides a clean, interactive front-end, and authentication is handled through a users.csv file with hashed passwords, allowing users to log in and receive personalized recommendations.
- The requests and dotenv libraries handle secure API communication and credentials loading, respectively.
- The backend logic is modular, with streamlit_app.py controlling the UI and login flow, and rag_chatbot.py connecting to the Watsonx model. During usage, the app securely retrieves a bearer token and calls the text generation endpoint using the model ID.
- Additional features like loading spinners, input validation, and error handling enhance usability.
- The project follows best practices with a requirements.txt for easy environment setup and supports future scalability for example, replacing CSVs with databases or upgrading to more advanced models. Overall, this system demonstrates how LLMs can power smart, data-aware assistants using modern Python tools.

Algorithm & Deployment

- Algorithm Selection-The system uses filter-based logic for college recommendations and a RAG (Retrieval-Augmented Generation) model using IBM Granite-3-8b-instruct for smart Q&A.
- Data Input-User inputs include EAMCET rank, preferred district, and academic marks. A dataset (colleges.csv) with college details and cutoff ranks is used.
- Training Process-Since IBM Granite is a pretrained foundation model, there's no local training. The system uses RAG to fetch relevant data and send it as context for inference.
- Prediction Process-The system filters colleges based on input, then passes context and queries to the Granite model via Watsonx.ai. The model generates accurate, real-time responses for user questions.

Result


College Admission Agent
localhost:8501
Deploy
Login / Register
Select Option
Login
Register
Username
ravi gudipati
Password
ravi@1977
Login
College Admission Assistant Chatbot
Hello ravi gudipati, ask anything below!
Get College Recommendation
Enter your Intermediate Marks (out of 1000):
982
Enter your EAMCET Rank:
12002
Preferred Location
Hyderabad
Recommend Colleges
Ask our AI Chatbot
Ask a question related to admission, branches, location, etc.


College Admission Agent
localhost:8501
Deploy
Login / Register
Select Option
Login
Register
Username
ravi gudipati
Password
ravi@1977
Login
Ask our AI Chatbot
Ask a question related to admission, branches, location, etc.
can I get CSE in VNR VJIET
Get Answer
Answer:
2023?
The eligibility criteria for Computer Science and Engineering (CSE) in VNR VJIET (VNR Vijayabhaskar Institute of Engineering and Technology) for the year 2023 have not been officially announced yet. Please check the official website or contact the admissions office for the most accurate and up-to-date information.

Conclusion

- The College Admission Agent system, powered by IBM Watsonx.ai and Granite LLM, serves as a smart and interactive solution to assist students in their college admission journey. By integrating AI-powered recommendations based on academic performance, location preferences, and EAMCET ranks, the system simplifies the decision-making process for students. The deployment using Streamlit provides an intuitive and accessible interface, allowing students to interact with the model seamlessly. The inclusion of a RAG-based chatbot ensures that users can get accurate, real-time answers from official admission PDFs. Overall, this solution enhances transparency, guidance, and efficiency in the admission process, making it a valuable tool for both students and educational institutions.

Future scope

- The College Admission Agent system holds vast potential for future enhancements and scalability. One of the major future directions is expanding support to include other state and national-level entrance exams such as JEE, NEET, and CUET, making the platform accessible to a broader range of students. Integration of multilingual support will allow regional language users to interact comfortably with the chatbot. Further, AI can be leveraged to analyze past admission trends and predict future cutoffs, enabling more accurate recommendations. The system can also be extended to include features like college comparison, scholarship assistance, real-time admission alerts, and a personalized student dashboard. With advancements in LLMs and cloud technologies, the solution can evolve into a comprehensive digital admission counselor for students across India.

References

- IBM Watsonx.ai Documentation – https://www.ibm.com/docs/en/watsonx
- IBM Granite Foundation Models – https://www.ibm.com/blog/announcements/granite-models
- Streamlit Documentation – https://docs.streamlit.io
- Pandas Library Documentation – https://pandas.pydata.org/docs
- Scikit-learn Documentation – https://scikit-learn.org/stable/documentation.html
- LangChain for RAG Implementation – https://docs.langchain.com
- EAMCET Official Website (for rank and admission references) – https://eamcet.tsche.ac.in
- Kaggle Datasets for College Information – https://www.kaggle.com

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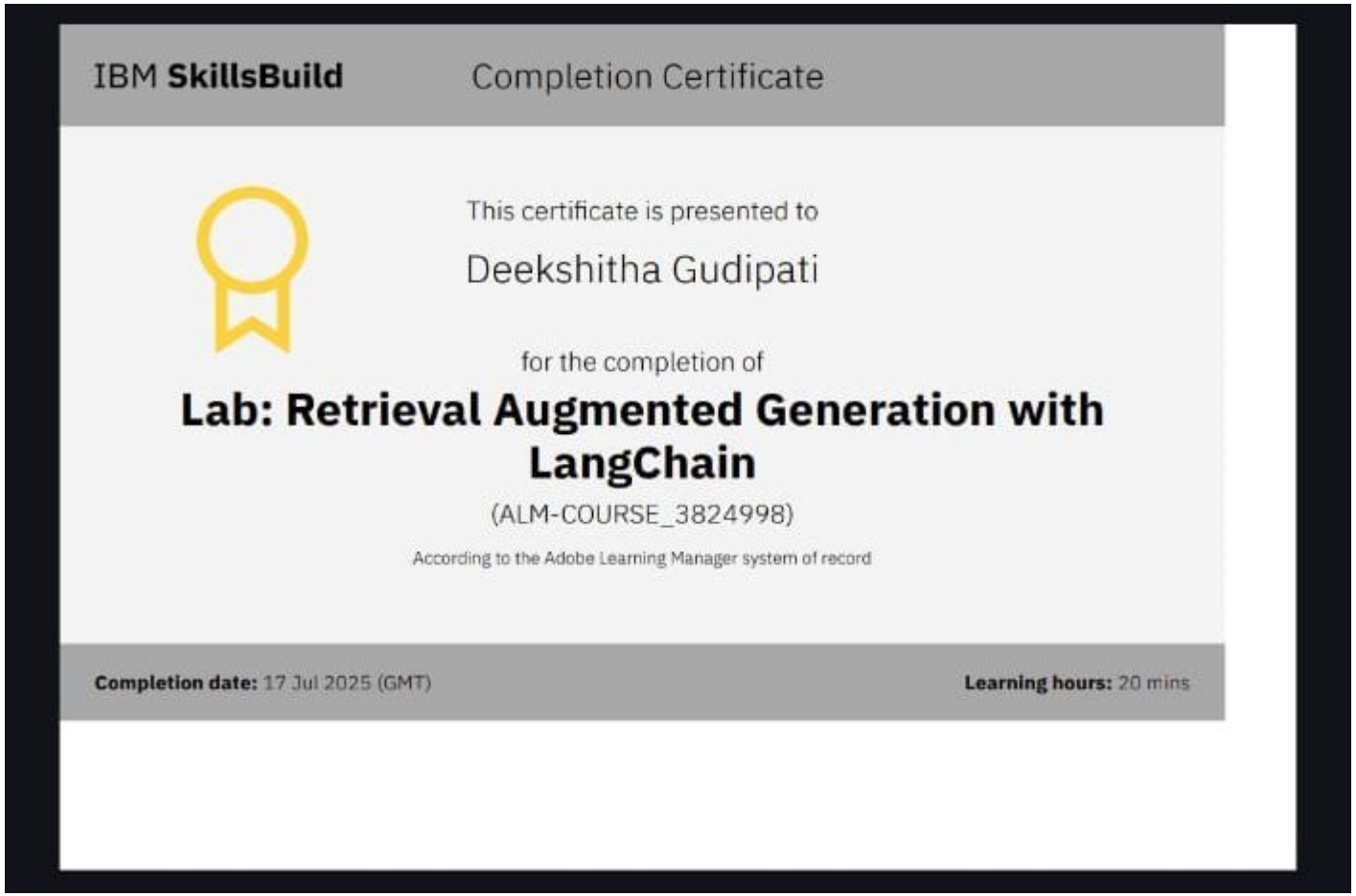
Lab: rag with Langchain



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Github link- https://github.com/Deekshitha-Gudipati/college-admission-agent

THANK YOU

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