BankBot AI

Chatbot Smart Conversational Banking System

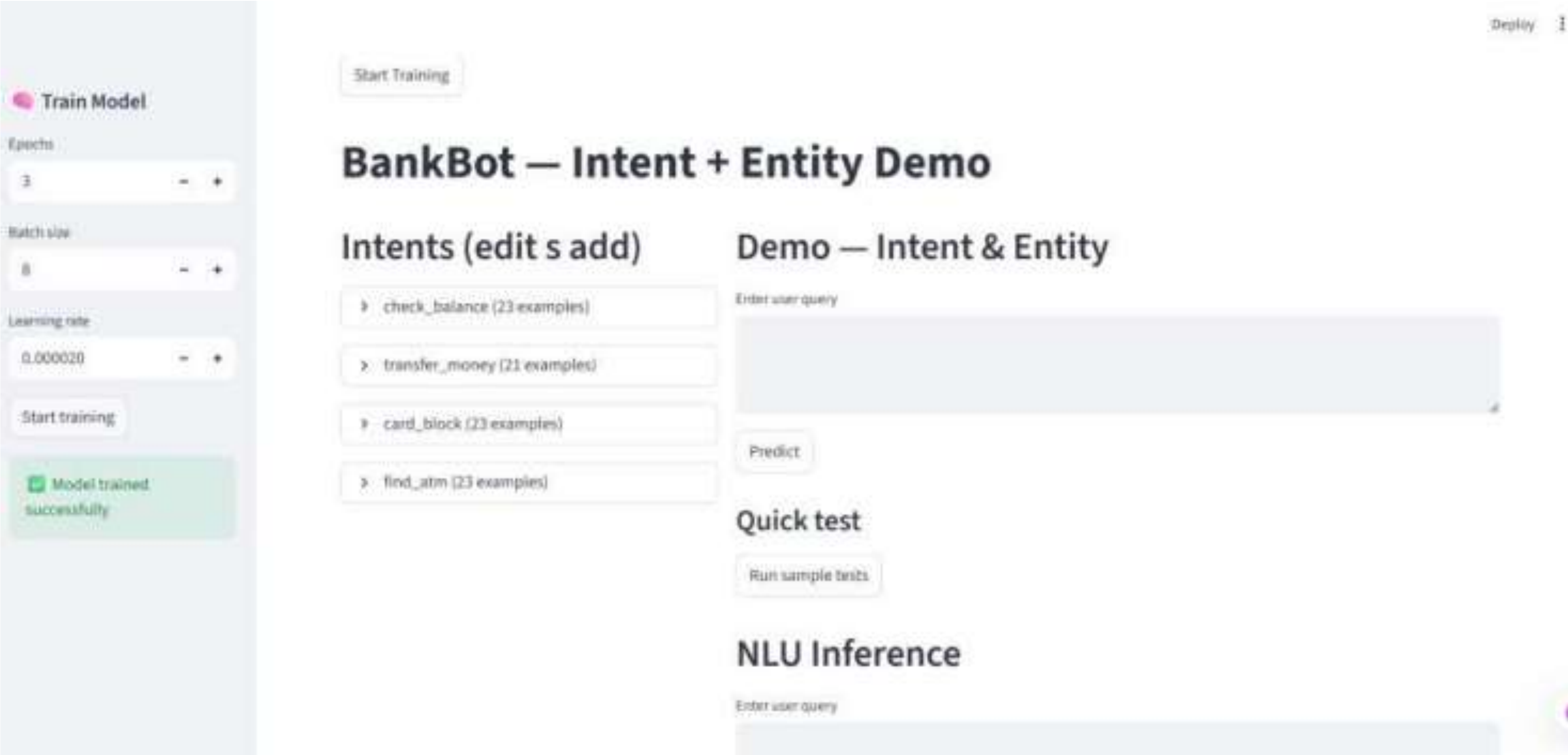
Milestone 1+Milestone 2 Milestone 3+Milestone 4

Problem :

Customers often have recurring banking queries related to account balance, interest rates, loan eligibility, transaction status, branch details, etc. Relying on manual customer service teams leads to delays and high operational costs. This project aims to build an intelligent chatbot that can handle these questions through natural conversations. It will support both rule-based and machine learning approaches to ensure accuracy and scalability. The chatbot will be accessible via web interface and possibly integrated into mobile apps or WhatsApp.

Milestone 1

- This is mainly revolve around finding entity and intent recognition .
- Handles intents like balance check, loan inquiry, card blocking, branch locator, and more.
- Interference using streamlit .
- Backend using SQlite .



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Milestone 2:

- This is Ai powered chatbot , which uses grog api and streamlit , llm , etc for the interactive interface

- This has a responsive UI with option to create user
  , login the with the same account
- And there is Chatbot Which is capable to tell details 1)about user ,
  2) type of card ,
  3)amount in account ,
  4)transaction between various user
- This also maintain a Database in the backend using
  SQlite which contain
  1)user name ,
  2)password(encrypted form),
  3)type of account ,

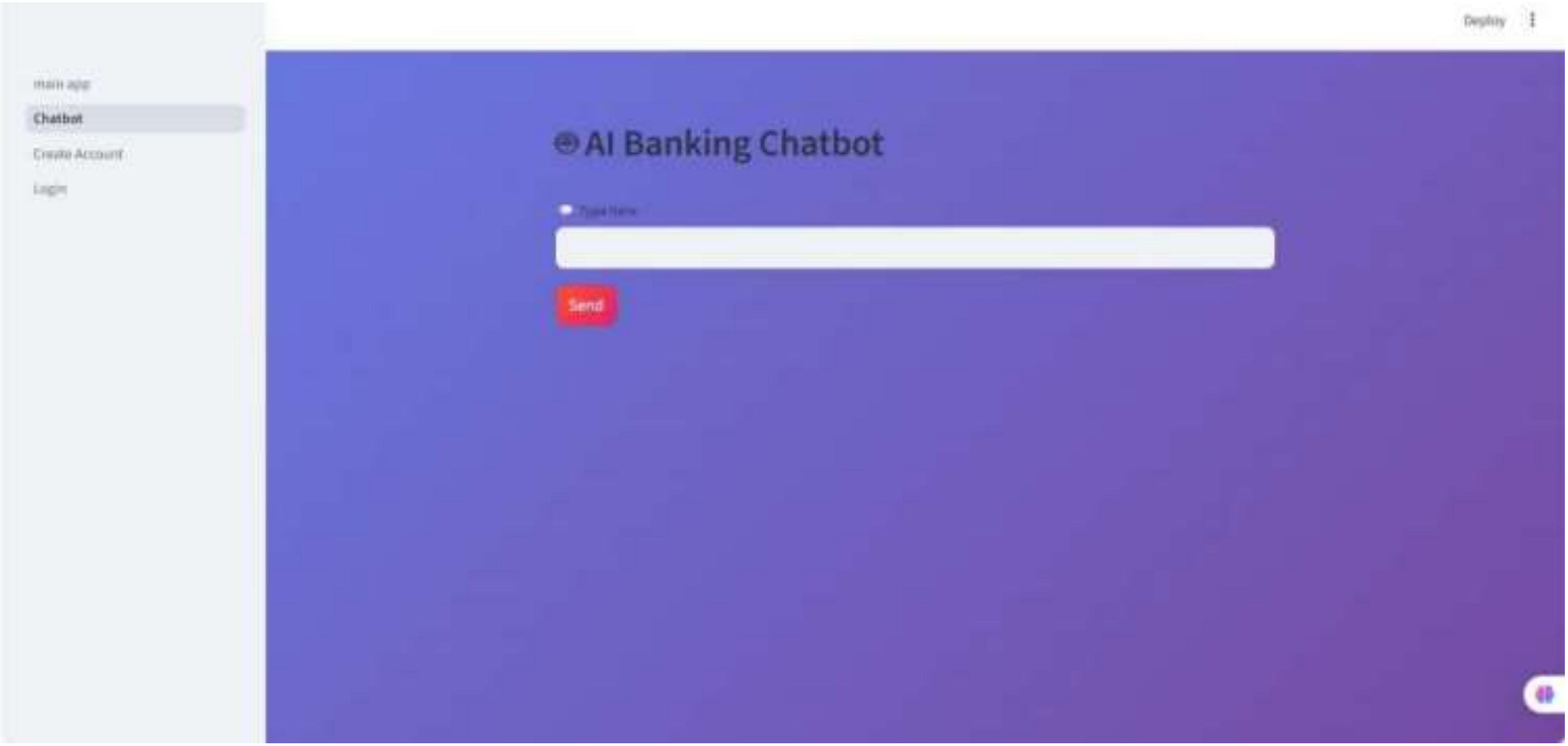
  4)transaction,
  5)amount in account

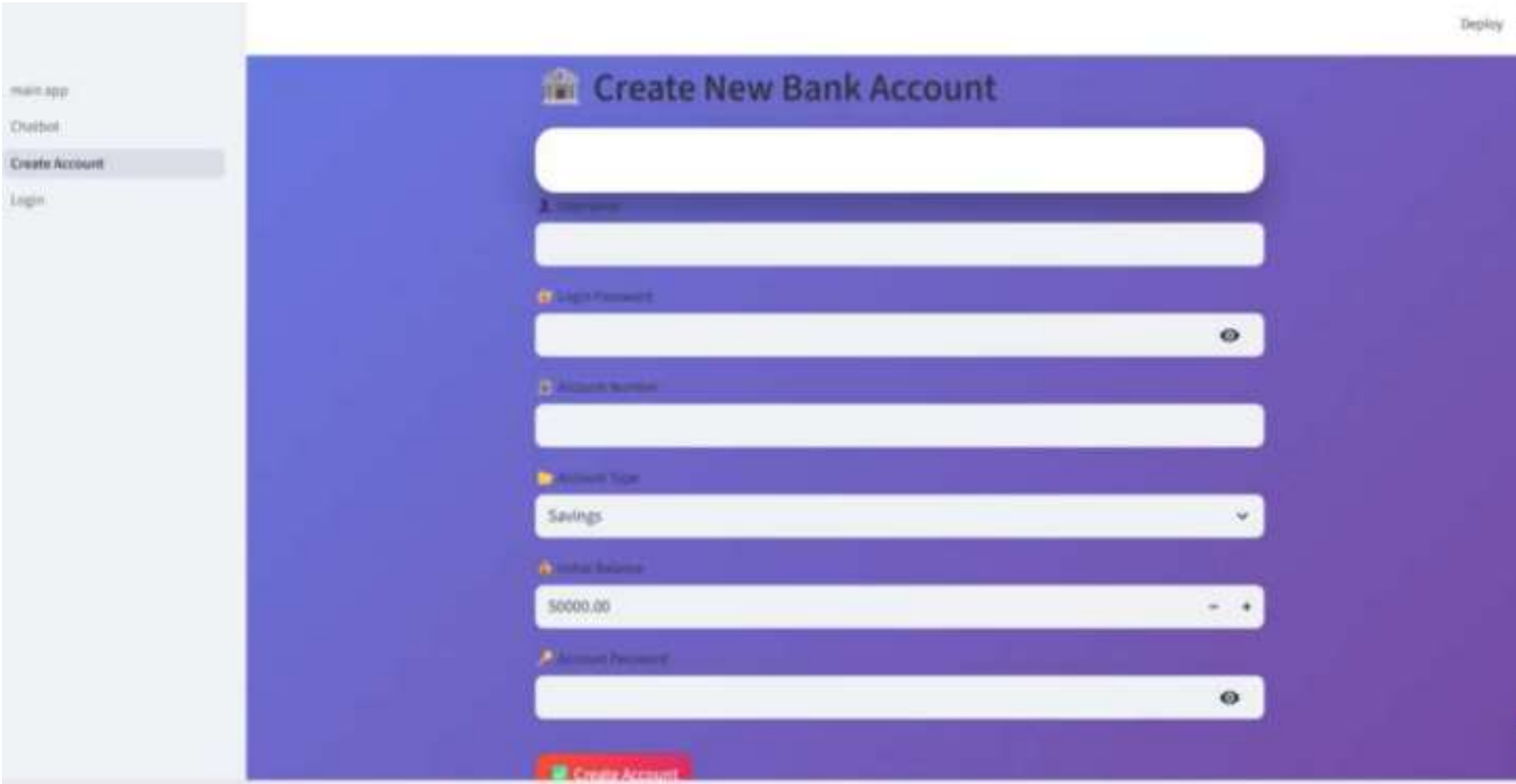
Problem :

1) Traditional banking systems: · 2)Time-consuming manual processes · 3)Limited working hours

4)No instant account support 5)Difficult for non-technical users

Output:


main app
Chatbot
Create Account
Login
Deploy
AI Banking Chatbot
Send



Milestone 3:

- Milestone is an extended version of the milestone 2 , milestone 2 can

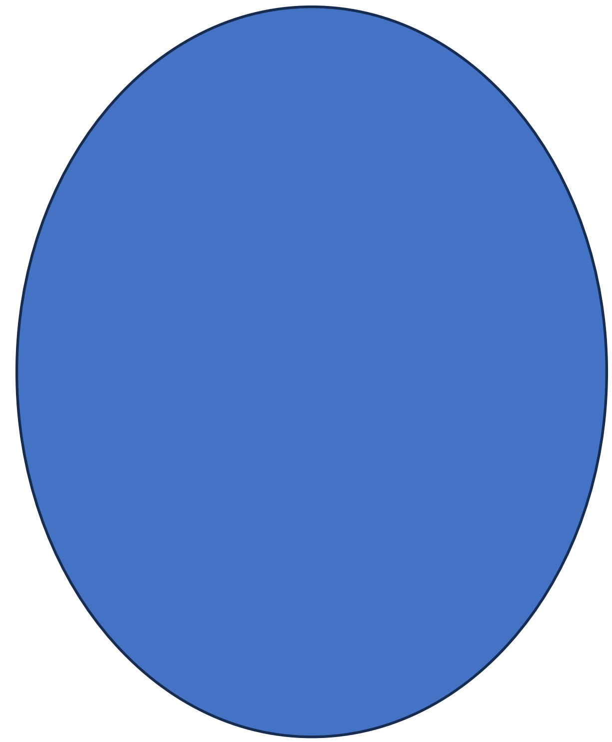
Answer only question related to transfer, cards , account but the milestone 3 can answer the general question , question of the various field mainly

- This use Technology such as Groq api , local llm ,

- This also uses local llm
- This is Domain-aware AI chatbot now earlier it was simple Q&A bot
- LLM generic answer

Problem Faced :

- Simple Q&A bot vs Domain-aware chatbot difference
- Current project me **exact problems**
- llm_local.py & llm_gorg.py ke context me issue
- Missing **domain classification & routing logic**
- Clean **architecture explanation**



Technology Used:

1. LLM Local (llm_local.py)

Definition:

LLM Local is a **domain-specific intelligence layer** designed to answer questions using **local and structured data sources**.

Data Sources

- Local databases (MySQL / SQLite)
- CSV files (e.g., iris.csv)
- Internal project-specific data

How it Works

- The user query is processed against local data
- Responses are generated using database queries, embeddings, or rule-based logic
- It does not rely on external APIs or internet-based knowledge

Strengths

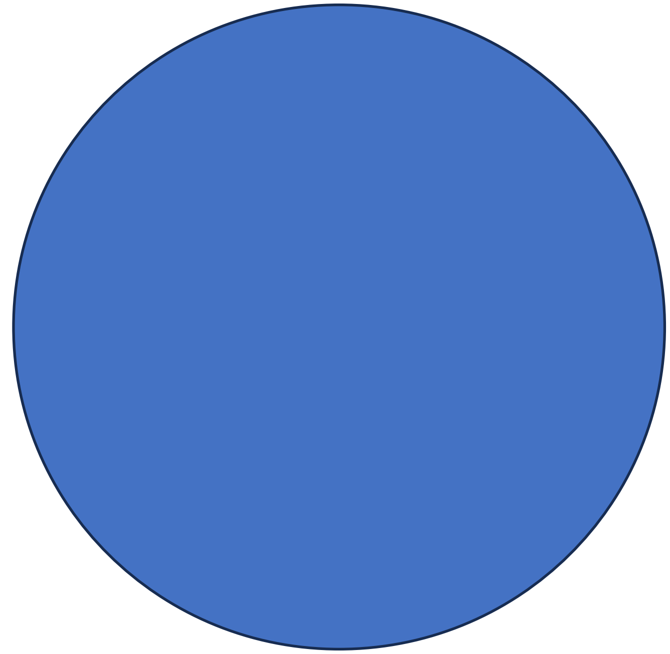
- High accuracy for internal data
- Fast response time
- Data privacy and security
- Ideal for banking, internal tools, and structured datasets

Limitations

- Cannot answer questions outside the available data
- Not suitable for general AI/ML theory or conceptual explanations

Example Queries

- "What is the balance of a customer?"
- "How many features are in the Iris dataset?"
- "Show the last transaction details"



2. LLM Groq / General LLM (llm_gorg.py)

Definition:

LLM Groq is a **general-purpose language model** used for answering **theoretical and conceptual questions** related to domains like Data Science, Machine Learning, and Deep Learning.

Data Source

- Pre-trained large language models (Groq / GPT / HuggingFace)
- Trained on large-scale, general-purpose data

How it Works

- Understands the semantic meaning of the question
- Generates explanations using reasoning and language understanding
- Does not depend on local project data

Strengths

- Explains complex concepts clearly
- Handles unseen and open-ended questions

- Suitable for learning, theory, and comparisons

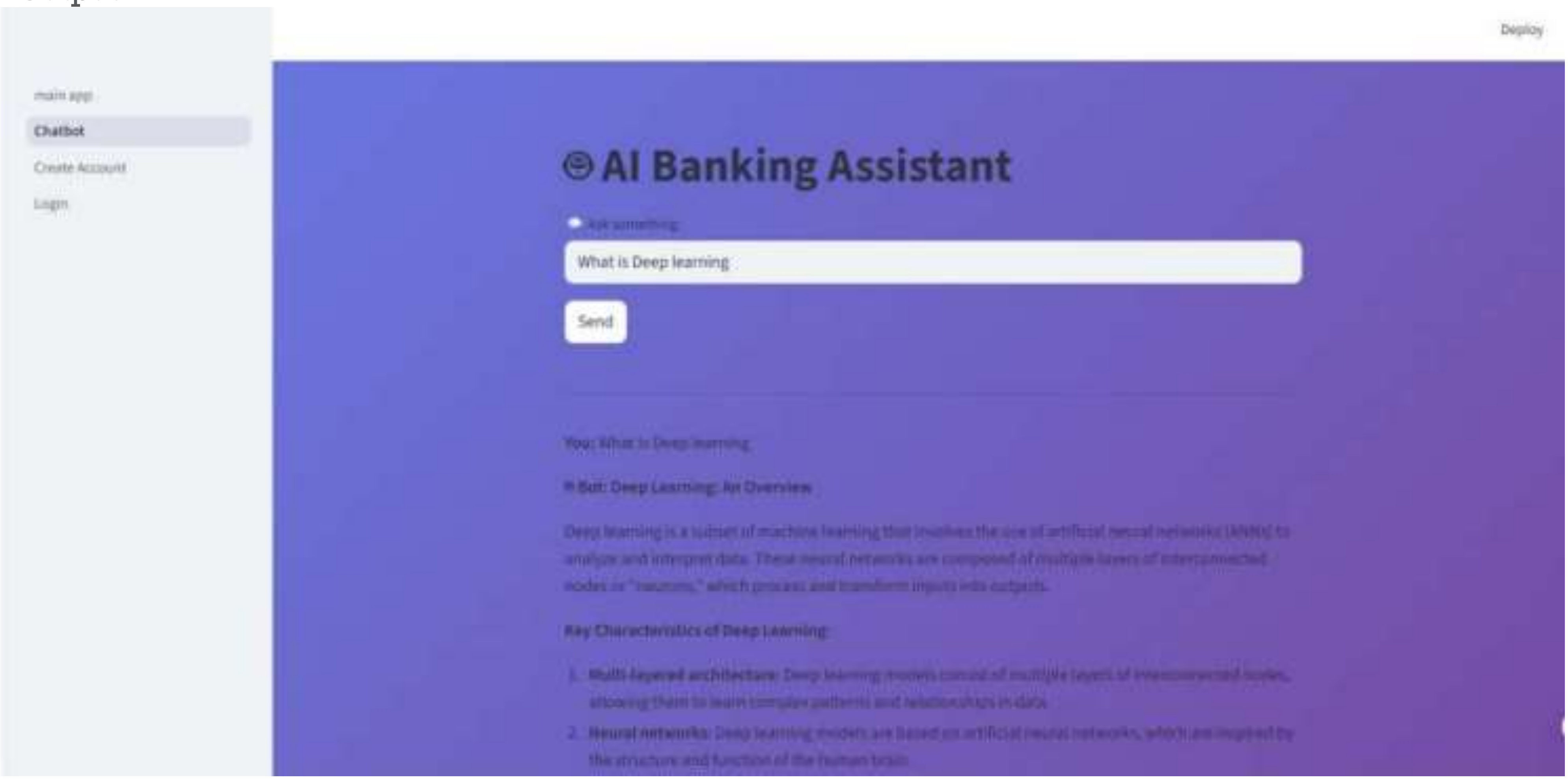
Limitations

- Answers can be generic
- May produce hallucinated responses
- No access to internal databases

Example Queries

- "What is backpropagation in neural networks?"
- "Difference between supervised and unsupervised learning"
- "Explain overfitting with an example"

Output:



Milestone 4:

So the milestone four revolves around taking user intent query and then classifying the same based the on the intent as

1)Transfer money ,

2)Card block ,

3)Find Atm

4)Check balance

To obtain pie chat based on the queries comparison , could be better understood by output.

This has an option to count the type of the question based on the query and can also export the question count list as per the requirement

Editorial could also be trained .

We can export the file.

Technology Used:

- Python
- LangChain
- Groq LLM
- Local LLaMA (GGUF)
- SQLite
- Streamlit

Problem Faced:

Intent Misclassification
Some user queries were ambiguous and matched multiple intents, which led to incorrect classification, especially when queries contained overlapping keywords.

Confidence Score Variations
Similar queries sometimes produced different confidence scores, making it challenging to define a fixed threshold for accurate intent detection.

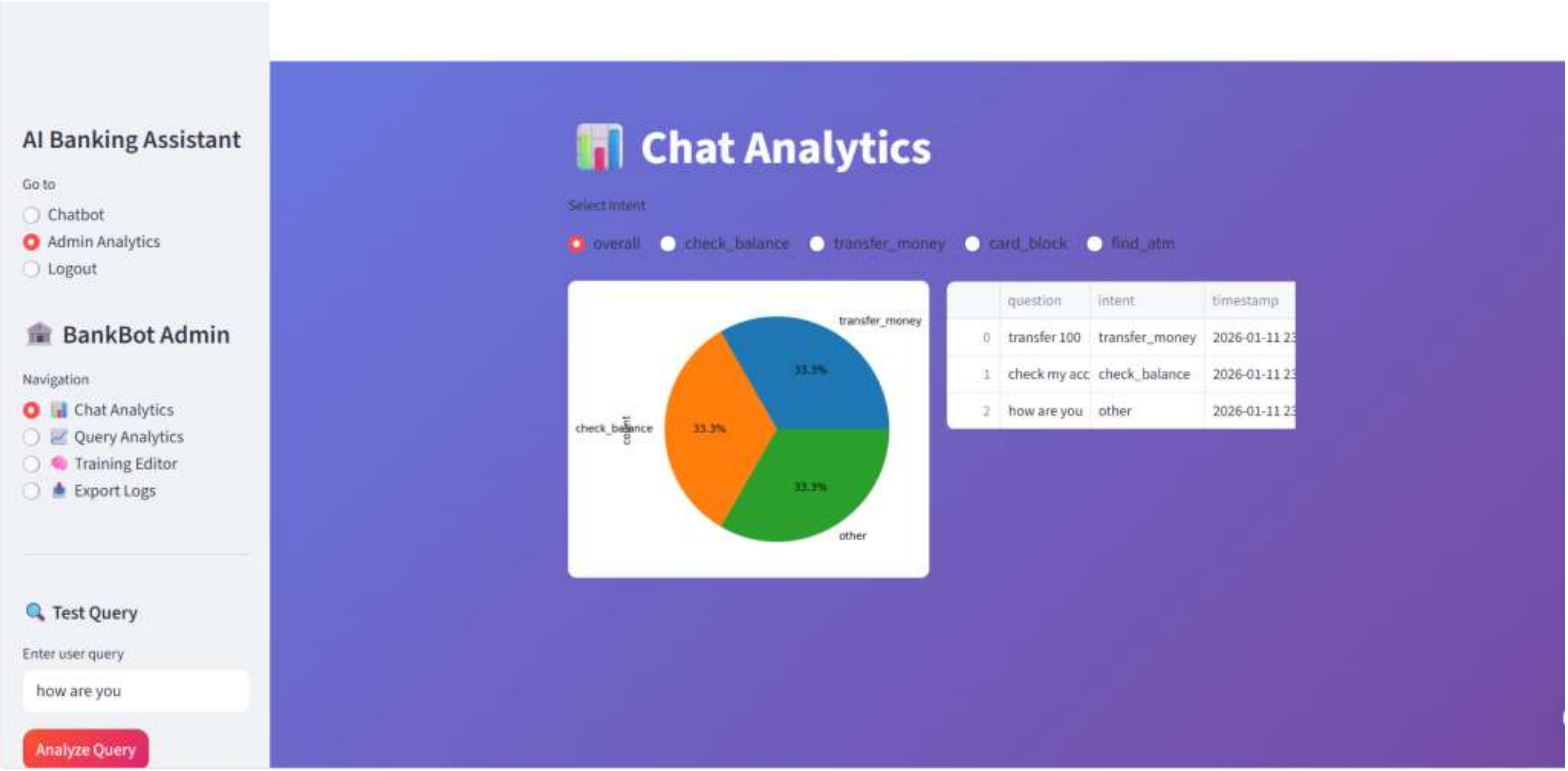
Limited Training Data
Initial training examples were limited, which affected the accuracy of intent prediction and required frequent updates to the editorial/training data.

Visualization Handling
Managing pie chart and bar chart rendering dynamically in Streamlit based on user selection required careful state and layout handling.

Performance Issues with Local LLaMA
Running the GGUF-based local LLaMA model resulted in higher latency compared to cloud-based models, especially during repeated query analysis.

Data Persistence and Logging
Maintaining consistent query logs in SQLite and syncing them with real-time analytics dashboards required additional handling.

Model Switching Complexity
Supporting both Groq LLM and local LLaMA increased complexity in configuration and response standardization.


AI Banking Assistant
Go to
Chatbot
Admin Analytics
Logout
BankBot Admin
Navigation
Chat Analytics
Query Analytics
Training Editor
Export Logs
Test Query
Enter user query
how are you
Analyze Query
Chat Analytics
Select Intent
overall
check_balance
transfer_money
card_block
find_atm
transfer_money
33.3%
check_balance
33.3%
33.3%
other
question
intent
timestamp
0 transfer 100 transfer_money 2026-01-11 2
1 check my acc check_balance 2026-01-11 2
2 how are you other 2026-01-11 2

AI Banking Assistant

Go to

- Chatbot
- Admin Analytics
- Logout

🏦 BankBot Admin

Navigation

- 📊 Chat Analytics
- 📈 Query Analytics
- 🧠 Training Editor
- 📤 Export Logs

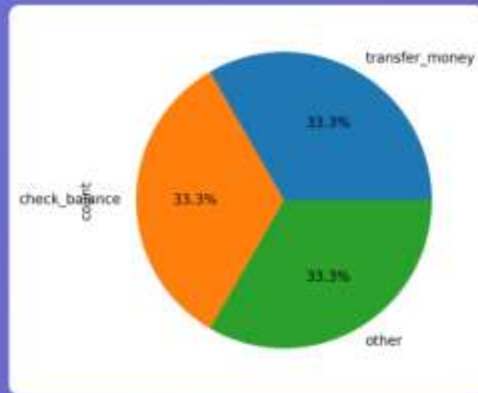
🔍 Test Query

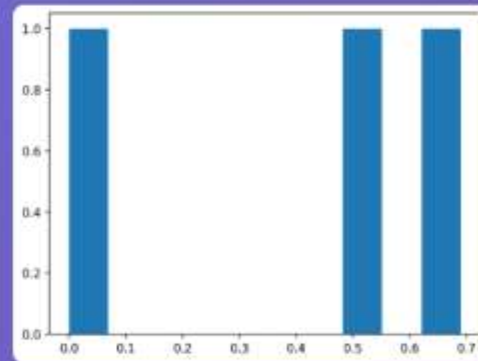
Enter user query

how are you

Analyze Query

📈 Query Analytics





	question	intent	confidence	timestamp
2	how are you	other	0	2026-01-11 23:24:39
1	check my account	check_balance	0.5	2026-01-11 23:24:32
0	transfer 100	transfer_money	0.69	2026-01-11 23:23:19

Thank You