Team Name: CodeCrafters

Task 03 Report: Smart Bank Loan Support Chatbot

Problem

The Loan Management System is a comprehensive platform designed to assist users in their journey toward obtaining loans. It offers a range of features to facilitate the process, from checking eligibility to providing personalized recommendations.

Functionalities

- Loan Eligibility Check
- Loan Products Information
- Application Process Guidance
- FAQs and Troubleshooting
- Personalized Recommendations

Implementation

First, we get the details of the loan that the bank provides to the customers. That pdf will be ready using PyPDF2 and the characters of the document. The document is mapped to 3D space and stored in our system.
When the message is sent to the chatbot, the system will find the relevant point in the 3D space. Then the relevant area of the initial doc was chosen using the coordinates of that space. Then we send a request with the relevant area and the message to the OpenAI API. Then the result will be displayed in the chat.

1. Initial Data Acquisition and Processing:
    - The system initiates by acquiring comprehensive loan details provided by the bank to its customers. This information, typically contained within PDF documents, undergoes thorough processing.
    - Using PyPDF2 library in python, the system efficiently extracts characters from the PDF documents, transforming them into machine-readable text format.
2. Spatial Mapping for Information Organization:
    - Leveraging innovative spatial mapping techniques, the system organizes the extracted textual data within a three-dimensional (3D) space. Each piece of loan-related information is meticulously positioned as a distinct point within this spatial framework.
    - This spatial mapping not only enables efficient storage and retrieval of information but also facilitates intuitive navigation and access to relevant details based on user queries.
3. User Interaction and Query Interpretation:

- Upon receiving a user message, the system engages in comprehensive query analysis to discern the user's intent and extract key parameters necessary for generating an accurate response.
- Employing advanced natural language processing algorithms, the system interprets the user's query with precision, ensuring a deep understanding of the user's information needs.
- This ensures the cost-efficiency of the system and the accuracy of the response.

4. Precise Information Retrieval:
    - Drawing upon the spatial coordinates within the 3D representation, the system swiftly identifies the precise location of relevant loan details corresponding to the user's query.
    - By pinpointing the exact area within the initial document that contains pertinent information, the system ensures that responses are not only accurate but also contextually relevant to the user's inquiry.
    - This ensures the answer will be correct and the scope will be corrected.
5. Integration with OpenAI API for Contextual Understanding:
    - Integrated with the extracted textual data and the user's query with the history of the previous chats, the system seamlessly interfaces with the OpenAI API using LangChain, leveraging its advanced natural language understanding capabilities.
    - Through this integration, the system enhances its contextual understanding of the user's query, enabling it to generate nuanced and informative responses that align with the user's needs.
    - This makes the response human-readable and enhanced for the customer.
6. Dynamic Response Presentation:
    - Finally, the system presents a meticulously crafted response to the user within the chat interface, offering a comprehensive range of information, including detailed loan product descriptions, eligibility criteria, and application procedures.

How to run,

To utilize the Loan Support Chatbot, adhere to these steps:

1. Confirm that you have installed the necessary dependencies and included the OpenAI API key in the .env file.
2. Launch the main.py file utilizing the Streamlit CLI. Execute the subsequent command: *streamlit run app.py*
3. The application interface will open in your default web browser once launched.
4. Follow the instructions provided to load multiple PDF documents into the application.
5. Utilize the chat interface to ask questions in natural language about the loaded PDFs.