

INTELLIHACK TASK 03

Smart Bank's Loan Support System

Overview

The provided Streamlit application aims to implement a comprehensive loan support system for Smart Bank, a prominent bank in Sri Lanka. The application integrates a conversational AI based on large language models (LLMs), designed to assist users with various loan-related inquiries and services. This solution involves key technologies such as the LangChain library, OpenAI's embeddings, and FAISS for vector storage.

Functionality:

Loan Eligibility Check: Assesses eligibility based on user-provided information (credit score, income, etc.).

Loan Product Information: Provides details on features, interest rates, repayment terms, and eligibility for various loans (personal, housing, education).



I want to know about housing loans



Smart Bank offers various housing loan options to cater to different needs. Here is an overview of the housing loan schemes available:



2.1. Housing Loan Scheme:

- **Loan Purposes:**
 - Purchase land to construct a house later
 - Purchase land and construct a house
 - Construct a house on land owned by the borrower
 - Purchase a house/partly constructed house/condominium unit
 - Complete construction/renovation/extension/repair of an existing house/condominium unit
 - Landscaping/interior decoration of the house/condominium unit
 - Construction of houses/apartments for sale (commercial purpose)

Application Process Guidance: Guides users through the application steps and required documents.



✓ Context Retrieval: How can I apply for a housing loan with Smart Bank?



To apply for a housing loan with Smart Bank, you can follow these steps:

1. **Calculate Your Eligible Loan Amount:** Use the "Loan Calculator" provided on our website to determine the loan amount you are eligible for based on your financial details.
2. **Visit the Online Application Form:** Access the housing loan application form by visiting the following link: [Smart Bank Housing Loan Application Form](#).
3. **Provide Financial Details:** You will need to input your financial information, including your income, expenses, and any other relevant details required for the application.
4. **Specify Your Purpose:** Clearly state the purpose of your housing loan application. Depending on your purpose, you may be asked to provide additional information to process your request.
5. **Submit Your Application:** Once you have filled out the online application form with all the necessary details, submit it for review.

After you apply:

- You will receive an SMS with a reference acknowledging your request.
- If your application is eligible to proceed, you will be notified via email to submit the required documents.
- Upon approval of your loan, you will receive SMS/email confirmation with the next steps.

If you have any specific questions or need further assistance during the application process, feel free to ask!

FAQ and Troubleshooting: Answers common questions and offers advice (improving credit score, handling application rejections).

Personalized Recommendations: Recommends suitable loan products based on user's financial goals and needs.



I'm a ML Engineer and I want to buy a house. What kind of loan that you can offer?

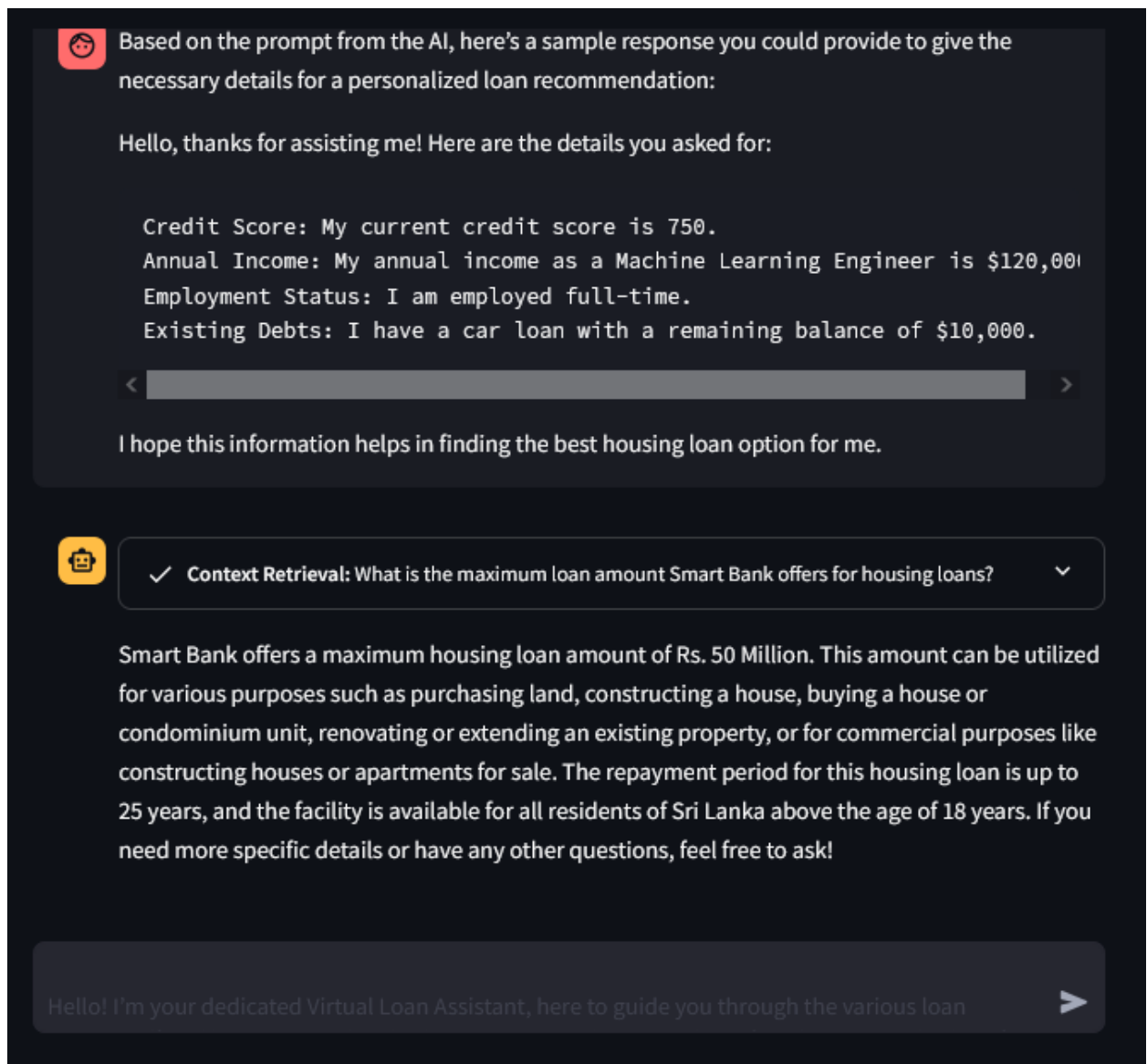


Context Retrieval: What kind of loan can Smart Bank offer to a Machine Learning Engineer who wants to buy a house? ▼

To assist you better, I would need some additional information to determine the most suitable loan option for a Machine Learning Engineer looking to buy a house:

1. **Credit Score:** Do you know your current credit score or have an estimate of it?
2. **Annual Income:** What is your annual income as a Machine Learning Engineer?
3. **Employment Status:** Are you employed full-time, part-time, or self-employed?
4. **Existing Debts:** Do you have any existing debts or loans?

Once you provide this information, I can offer personalized recommendations on the loan products that Smart Bank can offer you for purchasing a house.



1. Initialization and Configuration

- **API Key Management:** The application checks for an OpenAI API key, a necessary credential for accessing AI models.
- **Document Loader and Preprocessing:** Utilizes PyPDFLoader to load loan-related documents and RecursiveCharacterTextSplitter to divide the text into manageable chunks, ensuring efficient processing.
- **Vector Storage and Retrieval:** Embeddings for the document chunks are generated using OpenAI's models, stored in a FAISS vector database, and a retrieval system is configured for efficient searching.

2. User Interface and Interaction

- **Page Configuration:** The page is set up with a title and an icon, ensuring a user-friendly interface.
- **User Input Handling:** Streamlit's chat feature facilitates interaction, capturing user queries and providing responses.

3. Conversational AI Setup

- **Memory Management:** ConversationBufferMemory is utilized to store and manage conversation history, enhancing the bot's context-awareness.
- **Prompt Configuration:** Custom prompt templates are defined to guide the AI's responses, aligning with the expected functionalities such as loan eligibility checks, product information, and application guidance.
- **AI Model Configuration:** The application employs OpenAI's GPT-3.5 model configured for streaming responses, which allows for real-time interaction.

4. Conversational Mechanics

- **Retrieval Integration:** The ConversationalRetrievalChain integrates real-time document retrieval with AI responses, enabling the bot to pull relevant information from the loaded documents dynamically.
- **Callback Handlers:** Custom callback handlers manage the retrieval process and AI response streaming. These handlers provide feedback within the UI about the ongoing processes, such as current retrieval status and dynamically updating responses.

Key Features

- **Contextual Awareness:** Leverages conversation history to provide relevant and personalized responses.
- **Streamlined Retrieval:** Integrates Langchain for efficient retrieval of loan-related information.
- **OpenAI Integration:** Utilizes GPT-3.5-turbo for comprehensive and informative responses.
- **User Interface:** Streamlit allows for a user-friendly chat interface.
- **Customization:** The chatbot prompt and data sources can be customized for Smart Bank's specific loan offerings and regulations.

Deployment:

This application can be deployed as a web app using Streamlit hosting or similar services.

Report Highlights:

- This solution demonstrates a powerful approach to building a loan support chatbot using a generative LLM and Langchain.
- The Streamlit integration creates a user-friendly chat interface for customer interaction.
- The use of conversation history and information retrieval enhances the chatbot's ability to provide contextual and informative responses.

Areas for Improvement:

- **Security:** Implement data security measures to protect user information.
- **Explainability:** Consider incorporating features to explain the LLM's reasoning behind its responses, especially for loan eligibility assessments.
- **Multilinguality:** If Smart Bank caters to diverse customers, explore multilingual LLM models or training for languages beyond English.
- **Error Handling:** Implement robust error handling to gracefully address unexpected inputs or situations where the LLM fails to generate a response.