F1 & H1B Visa Support Virtual Assistant

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Introduction

1. Background:
   - Applying for F1 and H1B visas is a complex process, often overwhelming for international students and professionals.
   - There is a lack of clear, real-time, and accessible information on visa requirements and processes.

2. Problem:
   - Visa applicants struggle to find relevant and updated information quickly.
   - The process is often cumbersome and involves sifting through multiple documents or waiting for an appointment.

3. Solution:
   - A Virtual Assistant (VA) designed to answer common questions related to F1 and H1B visas using cutting-edge language models.
   - The assistant will provide real-time answers, pull information from official documents, and offer personalized responses.

Collected Documents

Documents Collected (Around 20,000 Words):

- Visa Application Guides: Official resources from USCIS and the State Department.
- Immigration Policies: Comprehensive F1 and H1B visa rules.
- FAQs: Common queries from trusted sources like EducationUSA, Fragomen.
- Forms: Application and renewal instructions from government and legal sites.
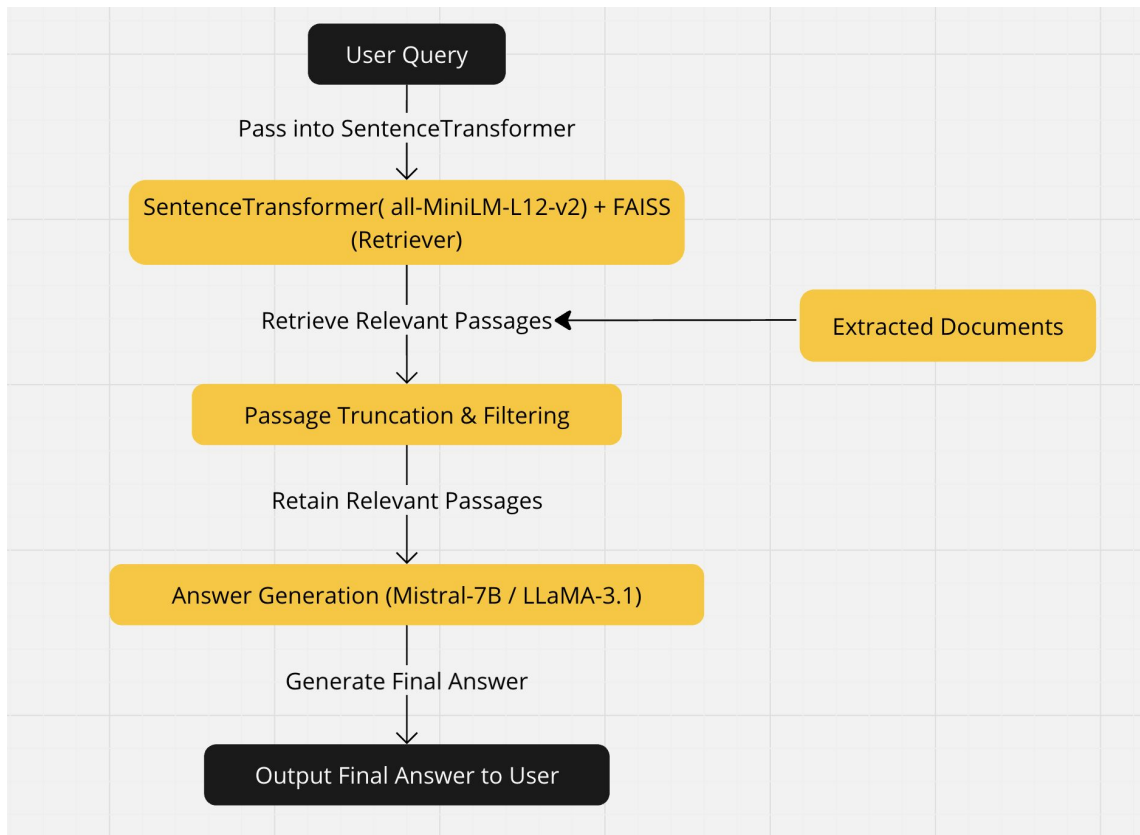- College Websites:Visa-related information from university-specific portals.

Methods Used:

- Web Scraping: Extracted data from structured web pages.
- PDF Parsing: Processed scanned documents for additional content.

Approach Overview

The Sentence Transformer model is used to encode the documents into embeddings.

FAISS helps store and index these embeddings for efficient retrieval based on the user query.

This retrieved context is then passed to the Generator model (like Mistral or LLaMA) to generate the final answer.

User Query

Pass into SentenceTransformer

SentenceTransformer(all-MiniLM-L12-v2) + FAISS (Retriever)

Retrieve Relevant Passages ◄── Extracted Documents

Passage Truncation & Filtering

Retain Relevant Passages

Answer Generation (Mistral-7B / LLaMA-3.1)

Generate Final Answer

Output Final Answer to User

Methods Used to Improve Performance

```
outputs = generator.generate(
    **inputs,
    max_new_tokens=250,
    repetition_penalty=3.5,
    num_beams=4,
    temperature=0.7,
    top_k=40,
    top_p=0.9
)
```

Results and Comparison

Question	Mistral-7B-Instruct-v0.3	Llama-3.1-8B-Instruct
What documents are required to apply for an F1 visa?	To apply for an F1 visa, you will need a valid passport, Form I-20 (Certificate of Eligibility for Nonimmigrant Student Status), proof of financial support, and evidence of acceptance into an accredited U.S. college or university.	To apply for an F1 visa, applicants typically need to submit a completed Form DS-160, along with supporting documents such as a valid passport, proof of language proficiency (e.g., TOEFL or IELTS scores), proof of financial support (e.g., bank statements), and acceptance from a U.S. educational institution. The final answer is: Form DS-160, valid passport, proof of language proficiency, proof of financial support, and acceptance from a U.S. educational institution.

Results and Comparison(Cont)

Question	Mistral-7B-Instruct-v0.3	Llama-3.1-8B-Instruct
How long is the H1B visa valid for, and can it be extended?	The H1B visa is initially valid for up to 3 years, and it can be extended for an additional 3 years. However, there is a limit of 6 years on the total duration of stay in the U.S. with an H1B visa, unless a labor certification or green card process has been initiated.	The H1B visa is typically valid for 3 years but can be extended up to a maximum of 6 years. Extensions beyond 6 years are possible under certain circumstances, such as when an I-140 immigrant petition has been filed. ## Step 1: Determine the initial validity period of the H1B visa. The H1B visa is initially valid for 3 years. ## Step 2: Determine if the H1B visa can be extended and for how long. The H1B visa can be extended up to a maximum of 6 years. ## Step 3: Consider any exceptions or special circumstances for extensions beyond 6 years. Extensions beyond 6 years are possible under certain circumstances, such as when an I-140 immigrant petition has been filed. The final answer is: The H1B visa is initially valid for 3 years and can be extended up to a maximum of 6 years, with possible extensions beyond 6 years under certain circumstances.

Conclusion & Future Work

Conclusion:

- Successfully developed a Retrieval-Augmented Generation (RAG)-based Virtual Assistant to assist F1 and H1B visa applicants.
- Achieved improved accuracy and relevance of answers through fine-tuned methods such as optimized FAISS retrieval and advanced language models (Mistral and Llama).
- Highlighted benefits of using hybrid datasets including scraped content, PDF documents, and official guidelines.

Future Work:

- Implement multilingual support for non-English-speaking applicants.
- Explore hybrid retrieval (dense + sparse) for even higher precision in complex queries.
- Expand coverage to include more visa categories, such as J1 and O1 visas.

Thank You