

# Visa Legal Advisor

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Data Science

## Introduction

This chatbot functions as a comprehensive reference tool for individuals with legal expertise, allowing them to access information from CFR Title 8 and FAM09 documentation.

Its purpose is to assist legal professionals in offering personalized guidance to individuals seeking advice and consultation for the H-1B visa application process.

## Target Audience

- Legal advisors who compile H-1B applications for clients
- HR reps processing applications
- H-1B applicants who have questions about the visa application process

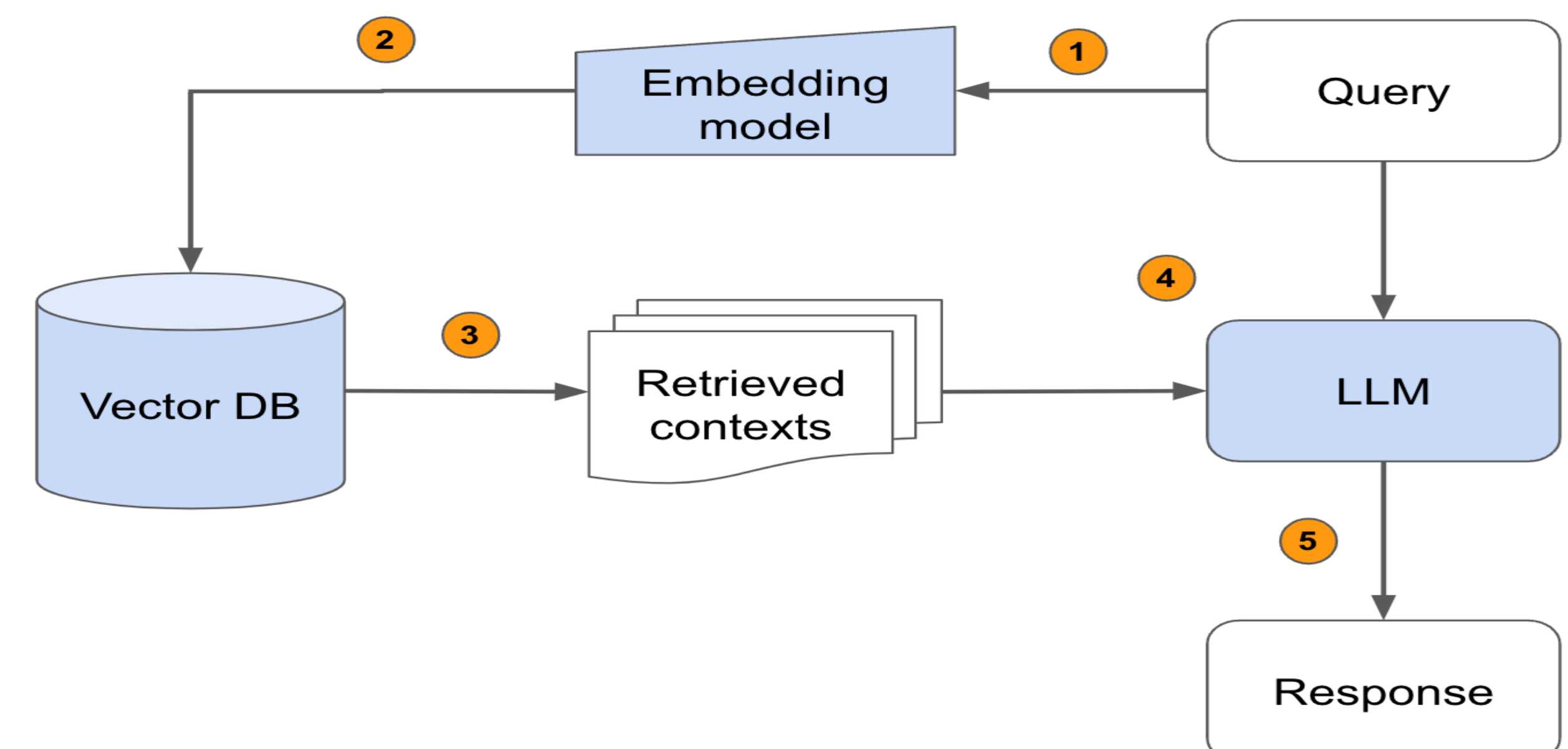
## Data and Scope

- Our curated database incorporates legislation from web scraped content from Code of Federal Regulations (CFR) which includes legislation from Dept of Homeland Security and Executive Office for Immigration Review, Department of Justice. We additionally pulled from US Foreign Affairs Manual (FAM)
  - CFR - xml files
  - FAM09 - html files
- Pinecone DB (vector count:2,954)

## Methodology

- Initialize Embedding Pipeline
  - Embedding model: 'text-embedding-ada-002'
  - LLM parametric knowledge is limited to its training data
    - Goal is to supplement LLM with source knowledge from a vector database
- Transform documents into vector embeddings
- Build Knowledge Base
  - Store the embeddings into a vector index using Pinecone DB (free)
  - Initialize and connect to the index
    - Dimension = 1536 (embedding model)
    - Metric: dot product similarity
  - Store source documentation into DB
- Initialize Chatbot Model:
  - Chat LLM: Open AI gpt-3.5-turbo-16k
- Framework library: LangChain
  - Connect output from vectorstore to chatbot for augmented prompting

## Architecture



Retrieval Augmented Generation (RAG) will retrieve precise information from custom knowledge base containing key details of H-1B eligibility criteria, required forms and documents, processing steps and timelines, quota and caps, per official USCIS data

## Coding and Results

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Building the Chatbot
LangChain library will provide the framework to bring various components together for our chatbot. Component 2: Initializing a ChatOpenAI object with OpenAI API key for new chatbot.

(1) from langchain.chat_models import ChatOpenAI

chat = ChatOpenAI(
    openai_api_key=OPENAI_API_KEY,
    model_name='gpt-3.5-turbo-16k'
)

(2) from langchain.schema import (
    Document,
    HumanMessage,
    SystemMessage,
    AIMessage
)

messages = [
    SystemMessage(content="You are a helpful assistant."),
    HumanMessage(content="Hi, I'm Jinmin Kim. How can I help you?"),
    AIMessage(content="Hi, great. Thank you. How can I help you?")
]

Retrieval Augmented Generation
Now utilizing our developed knowledge base, it's time to connect the knowledge base to the chatbot.

def augment_prompt(query: str):
    """Augment the prompt with relevant information from the knowledge base"""
    results = vectorstore.similarity_search(query, k=5)
    relevant_chunks = ""
    for chunk in results:
        relevant_chunks += chunk.page_content + "\n"
    augmented_prompt = f"{query}\n\n{relevant_chunks}\n\nAnswer the query. If an answer cannot be definitively given because it depends on various factors, ask for more information. Please try to answer to the best of your ability, even if this means only referring to a specific part of the provided information. It is recommended to consult with an immigration attorney or refer to the official USCIS website for the most up-to-date and accurate information."
    return augmented_prompt

(3) prompt = HumanMessage(
    content=augment_prompt(query)
)

res = chat(messages + [prompt])
print(res.content)
```

```
(1) prompt = HumanMessage(
    content=augment_prompt(query)
)

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Based on the provided information, having an advanced degree in computer science may impact your eligibility for the H-1B visa. The regulations state that an alien with an advanced degree can qualify for the H-1B visa. To determine your specific eligibility and the evidence required, it is recommended to review the CFR Title 8 documentation or FAM09 documentation related to the H-1B visa category for professionals holding advanced degrees.

(2) prompt = HumanMessage(
    content=augment_prompt(query)
)

res = chat(messages + [prompt])
print(res.content)

For advanced degree holders, the cap exemption for H-1B visas allows them to be exempt from the regular numerical limitations on the number of H-1B visas issued each fiscal year. To qualify for this exemption, you must:
1. Hold a United States advanced degree or a foreign equivalent degree.
2. Hold a United States baccalaureate degree or a foreign equivalent degree and have at least five years of progressive post-baccalaureate experience in the specialty.
To demonstrate your eligibility for the cap exemption, you will need to provide official academic records showing your degree or evidence of your experience in the form of letters from current or former employers. Please keep in mind that immigration policies can be complex and subject to change. It is advisable to consult with an immigration attorney or refer to the official USCIS website for the most up-to-date and accurate information.

(3) prompt = HumanMessage(
    content=augment_prompt(query)
)

res = chat(messages + [prompt])
print(res.content)

For an H-1B visa petition, your employer should ensure to include the following documents:
1. Form I-129: Petition for a Nonimmigrant Worker.
2. Labor Condition Application (LCA): This is a certified document from the Department of Labor (DOL) that verifies that your employer will pay you the prevailing wage and provide appropriate working conditions.
3. Supporting documentation: This may vary depending on your specific case, but typical supporting documents include:
    - Employer's letter explaining the job position, duties, and requirements.
    - Your resume or curriculum vitae.
    - Copies of your educational degrees, certifications, or transcripts.
    - Letters of recommendation or reference letters.
    - Any relevant licenses or memberships.
    - Contract or employment agreement between you and your employer.
    - Documentation of any specialized skills or qualifications required for the position.
    - Evidence of the employer's financial ability to pay your wage.
    - Company profile or brochures (optional).
It's important to note that immigration policies can be complex and subject to change. It's advisable to consult with an immigration attorney or refer to the official USCIS website for the most up-to-date and accurate information.
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## Conclusion/ Future Scope

We empower individuals to make more informed decisions at specific stages of H-1B visa process

Future experimentation with prompt engineering, updating personalization of chatbot, hyperparameter tuning, and expanding test database with legal documentation on citizenship application process