Building an AI-Powered Blog Generator with Open Source Models (Groq AI with Llama3-8B model **) and LangSmith for debugging**

How I Approached This Project

The goal of this project was to automate blog generation using an open-source language model. The system allows users to enter a topic and receive a well-structured blog post. Instead of generating the blog in a single step, I broke the process into multiple stages to make it more structured, flexible, and easy to debug.

Key Features Implemented

- The system generates multiple blog title suggestions instead of just one.
- It automatically selects the first generated title for blog generation.
- The system generates full blog content in a chosen writing tone.
- A short summary of the blog is also generated.
- The blog can be translated into different languages.
- LangSmith is used for debugging to track each step in the process.

To keep the system structured, I used LangGraph to define a clear workflow instead of calling the AI in a single step.

Tools Used

- Gradio was used to create an interactive user interface.
- LangGraph was used to structure the AI workflow step by step.
- Groq AI with Llama3-8B model was used to generate blog titles, content, and summaries.
- NLLB-200 was integrated for multilingual translation.
- LangSmith was used to track and debug AI-generated results.

- Hugging Face Spaces was chosen for deploying and hosting the final application.

Structuring the Blog Generation Process

To ensure that everything remained well-organized, I structured the workflow using LangGraph. This approach helped in breaking down the AI's tasks into separate steps, ensuring that each part worked correctly before moving on to the next.

Step 1: Generating Multiple Blog Titles

Instead of generating just one title, the AI creates three different title suggestions. However, rather than letting the user pick one, the system automatically selects the first generated title and proceeds to the next step.

Step 2: Generating Blog Content

Once the first title is selected, the AI generates a detailed and engaging blog post based on it. Users also have the option to choose a specific writing tone, such as formal, casual, or persuasive.

Step 3: Creating a Blog Summary

Since long blogs can be difficult to read quickly, an automatic summary generation feature was added. This step provides a short and easy-to-read version of the blog.

Step 4: Translating the Blog into Different Languages

To make the blog accessible to a global audience, NLLB-200 was integrated. This model supports over two hundred languages, allowing the AI to translate the entire blog into the selected language automatically.

Debugging with LangSmith

Ensuring that the model performs well and provides accurate outputs is one of the main challenges in AI projects. LangSmith was used to make debugging easier by tracking each step of the workflow.

LangSmith provided several benefits, such as:

- Allowing real-time tracking of the input and output of each step.
- Identifying exactly where issues occurred if something went wrong.
- Providing detailed logs that helped improve AI accuracy.

With LangSmith, it was possible to identify issues in AI responses and enhance the overall system.

Building the User Interface with Gradio

After setting up the AI workflow, a Gradio user interface was designed to make the system simple and easy to use. The process for users is as follows:

- Users enter a blog topic.
- They select a writing tone for the blog.
- They choose a language for translation.
- The system generates a blog title, full content, summary, and translated version.

The Gradio interface includes:

- A text box where users enter a topic.
- A dropdown menu to choose the writing tone.
- Another dropdown for selecting the translation language.
- Multiple text output boxes that display the generated title, blog content, summary, and translation.

This setup ensures that users can easily interact with the AI and generate high-quality blog content within seconds.

Deploying on Hugging Face Spaces

Once the system was functioning properly, it needed to be deployed online for public access. Hugging Face Spaces was chosen for deployment due to its support for Gradio applications, minimal setup requirements, free hosting for AI applications, and ease of updating the project when needed.

The deployment process involved three main steps:

- Uploading the application file to Hugging Face.
- Adding API keys securely using Hugging Face Secrets.
- Restarting the application to make it live for users.

Now, anyone can access the blog generator instantly without needing to install anything.

Final Thoughts

This project was a valuable opportunity to explore AI-powered content creation. By using LangGraph, Groq AI, and NLLB-200, a system was built that generates high-quality blogs with multiple title suggestions, different writing tones, summarization, and multilingual translation.

The integration of LangSmith for debugging made it easier to track and improve AI responses, while Gradio provided a simple and effective user interface. Finally, deploying the application on Hugging Face Spaces made it accessible to everyone.

Now, users can generate high-quality blog posts simply by entering a topic, making the process of content creation faster and more efficient.