

Problem Statement

Customized AI Kitchen for India

In the diverse culinary landscape of India, traditional recipes and cooking methods vary widely across regions, making it challenging for individuals to access. Despite the availability of numerous online recipes and cooking tutorials, there is a lack of personalized assistance that can cater to the unique preferences, ingredient availability, and cooking skills of Indian households.

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Unique Idea Brief (Solution)

Developed an AI-powered recipe generator using LLaMA 3 that creates personalized recipes based on the ingredients specified by users. By inputting the ingredients they have on hand, users receive tailored recipe suggestions that cater to their preferences. This tool ensures an enjoyable and customized cooking experience, focusing on maximizing the use of available ingredients.

Features Offered

- **Recipes Based on Ingredients:** The AI generates recipes specifically tailored to the ingredients users have available. By allowing users to input the ingredients they have on hand, the AI can create a wide range of diverse and creative recipes that make the most of these ingredients. This not only helps reduce food waste but also provides convenience for users who may not have the time or resources to acquire new ingredients. Whether it's a handful of common items or a mix of unique ingredients, the AI ensures that users can prepare delicious meals with what they already have.
- **Step-by-Step Instructions:** The AI offers detailed, easy-to-follow cooking instructions for each recipe, breaking down the process into clear and manageable steps. This feature is designed to cater to users of all cooking skill levels, from beginners to experienced cooks. Each step is crafted to be straightforward, ensuring that users can confidently follow along and successfully prepare the dish from start to finish. Additionally, the AI can provide tips such as when to adjust the heat, further enhancing the user's culinary skills and experience.

- **Emotional Touch:** The AI incorporates an emotional touch in the language of the recipes, making the cooking experience more engaging and enjoyable. By using phrases like "like my friend used to cook this regularly," the AI adds a personal and nostalgic element to the instructions. This feature aims to create a warm and relatable connection between the user and the recipe, evoking memories of shared meals and cherished traditions. The emotional touch not only makes the cooking process feel more intimate and enjoyable but also helps users form a deeper connection with the dishes they are preparing, turning routine cooking into a more meaningful and satisfying experience.

Process Flow

- **Install Dependencies:**
 - Set up your Colab environment and install required dependencies, including the LLaMA 3 model and supporting libraries.
- **Run the Model with Tunnel Access:**
 - Start the model and establish tunnel access for secure connectivity.
- **Access and Authenticate:**
 - Visit the provided URL and enter the IPv6 password for authentication.

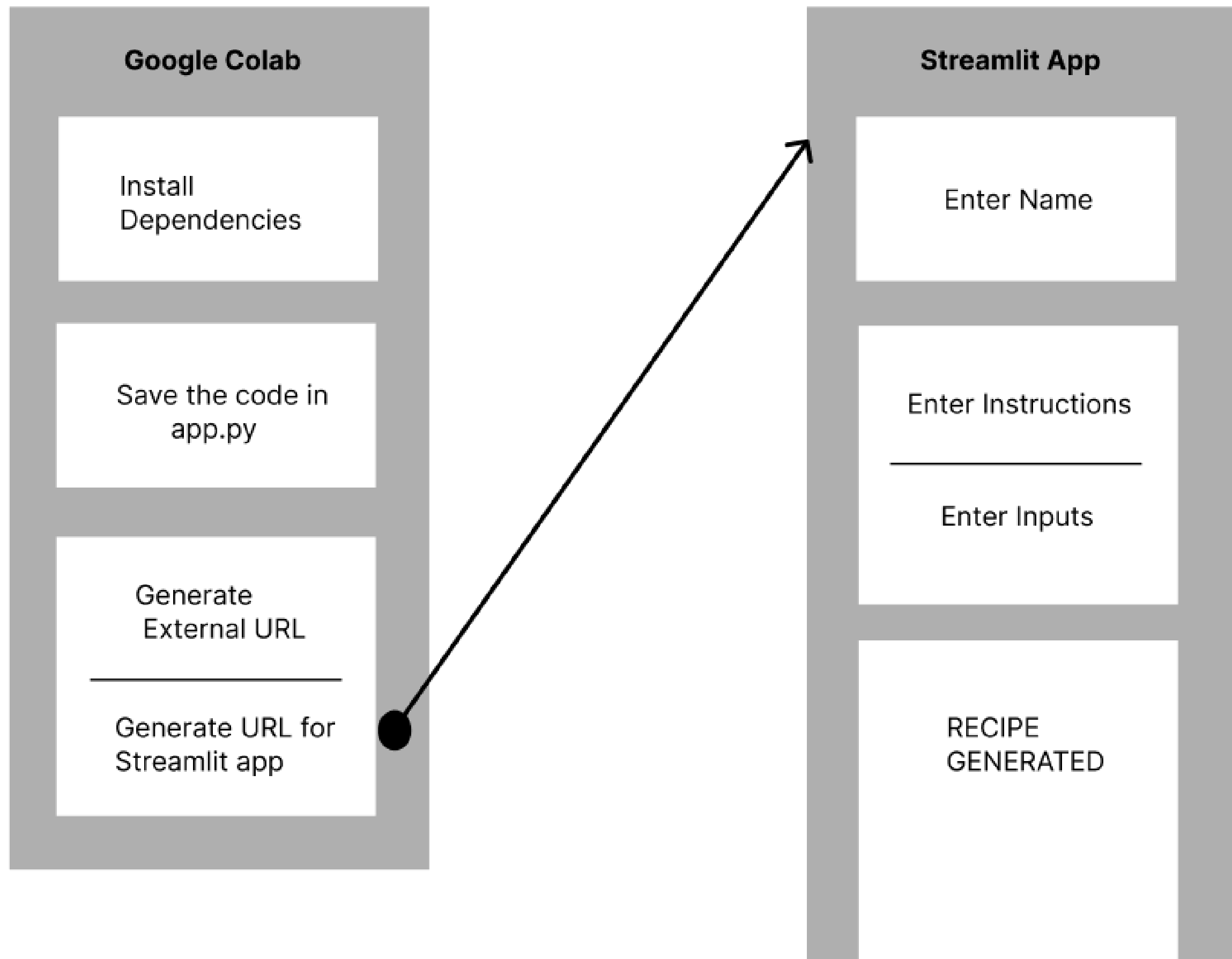
- **Personalize Your Experience:**

- Input your name to personalize the assistant.

- **Input Ingredients:**

- List the ingredients you have.
- Receive personalized recipe suggestions based on the available ingredients, complete with step-by-step instructions and emotional language.

Architecture Diagram



Technologies used

Fine Tuning of LLama-3 and APP Interface Part:

- **Python and LLaMA 3:**

- Python is the primary language used to fine-tune the LLaMA 3 model for generating customized recipes based on user-input ingredients.
- The project relies on Python for customizing and integrating the LLaMA 3 model to provide personalized recipe recommendations that align with user preferences.

- **PyTorch and Hugging Face:**

- PyTorch is employed for fine-tuning and deploying the LLaMA 3 model, enhancing its ability to generate contextually relevant recipe outputs.
- Hugging Face's libraries facilitate the integration of datasets and pre-trained models, streamlining the development of AI-driven recipe generation functionalities.

- **Colab Integration:**

- Google Colab serves as the platform for model fine-tuning sessions and code development, ensuring scalability and reproducibility in recipe generation tasks.
- Colab notebooks enable seamless deployment of the LLaMA 3-powered recipe generator, optimizing user experience and accessibility to personalized cooking solutions.
- Streamlit library is utilized to create an interactive application, enhancing user interaction with the AI-powered recipe generator.
- Cache memory management in CUDA GPU memory optimizes performance, ensuring efficient processing and responsiveness of the recipe generation application.

Team members and Contribution:

BALAJI SASANK CHAGANTI(SOLO PROGRAM MEMBER):

- Fine-tuned the LLaMA 3 model for personalized recipe generation based on user-input ingredients.
- Developed and optimized Python codebase for efficient recipe customization and integration.
- Managed PyTorch for training and deploying AI models to improve recipe recommendation accuracy.
- Integrated Hugging Face libraries to enhance dataset management and leverage pre-trained models for diverse recipe suggestions.
- Utilized Google Colab for collaborative model fine-tuning and scalable development.
- Created an intuitive Streamlit application interface for seamless user interaction with the AI-powered recipe generator.
- Implemented cache memory strategies for CUDA GPU to optimize computational efficiency during recipe generation tasks.

Conclusion

I have leveraged advanced AI and machine learning techniques to fine-tune the LLaMA 3 model for personalized recipe generation. Using Python, PyTorch, and Hugging Face libraries, I developed a robust framework capable of generating contextually relevant recipes based on user-specified ingredients. Google Colab was instrumental in facilitating model development, ensuring scalability and reproducibility. Integrating the Streamlit library enhanced user interaction through an intuitive application interface. By optimizing CUDA GPU memory with cache management, I improved computational efficiency. Overall, empowering users to explore and enjoy diverse culinary experiences effortlessly.