CSDX 627

GENERATIVE ARTIFICIAL INTELLIGENCE

ASSIGNMENT REPORT

FinancePilot– AI Personal Finance Assistant

Done by:

Abdul rahim S – 220171601003

Ajay M - 2202171601012

AI & DS – A

FinancePilot – Project Report

INTRODUCTION

Finance Pilot is a Generative AI-powered personal finance assistant that leverages natural language understanding to provide users with interactive insights into their spending habits. Built using advanced language models, the application allows users to ask financial queries in plain English and receive context-aware responses, transforming traditional expense tracking into a conversational experience. In addition to managing income and expenses, Finance Pilot offers personalized financial advice and budget suggestions through an AI-driven query interface. This project showcases how Gen AI can be integrated into everyday tools to enhance user experience, improve financial literacy, and support smarter money management for individuals.

PROBLEM DESCRIPTION

Managing personal finances can be overwhelming, especially for users unfamiliar with budgeting tools or financial planning. Traditional expense trackers provide numeric summaries but lack contextual guidance or intelligent feedback. This creates a gap in helping users make informed financial decisions.

Finance Pilot addresses this gap by introducing a Generative AI-driven interface that transforms the way users interact with their financial data. This project focuses on:

• Conversational finance tracking, where users can ask natural-language queries (e.g., “Am I overspending?” or “What’s my total for food this month?”) and receive contextual responses.

• Personalized budget tips generated by AI, providing guidance based on spending patterns and current balance.

• Seamless user experience through an intuitive web interface that integrates real-time interaction with the language model.

IMPLEMENTATION

Code Overview and Explanation

FinancePilot integrates Meta's LLaMA 3 language model with NLP techniques to power an intelligent, interactive financial assistant. Here's a breakdown of how the system works:

1. **HTML and Interface Design**
   • The expenses.html file defines the layout, including input fields for balance, expense entry, and natural-language queries.
   • Users interact through conversational input like "What's my remaining balance?" or "Suggest a way to save more," which feels intuitive and seamless.

2. **JavaScript Logic (expenses.js)**
   • Handles core logic for setting balances, tracking expenses, and interpreting user queries.
   • The handleQuery() function uses basic NLP techniques such as keyword recognition and pattern matching to extract user intent and context.

3. **Generative AI via LLaMA 3 (Running Locally)**
   • Meta's LLaMA 3 model is run locally on the user's system (or development server), which ensures faster response times and full control over the model without relying on external APIs.
   • Queries from the user are formatted as prompts and passed to the local LLaMA 3 instance.
   • The model generates smart, natural-language responses based on real-time data (e.g., total expenses, budget status).

4. **Natural Language Processing (NLP)**
   • Lightweight NLP preprocessing is applied before sending the input to LLaMA 3. This includes lowercasing, keyword filtering, and intent mapping to ensure that the model generates relevant, context-aware outputs.
   • The output from LLaMA 3 is dynamically customized using current user financial data.

5. **Styling and User Experience**
   • CSS enhances the layout for clean readability and ease of interaction.

• The user experience mimics chatting with a personal finance advisor—powered by actual Generative AI and not predefined templates.

6. **Firebase Integration**
   • Firebase Authentication is used to manage user sessions and ensure privacy.
   • Each user's interactions and data are securely scoped to their session.

ALGORITHM

1. **Input Processing**
   • The user inputs a natural language query (e.g., "What's my total spending this week?").
   • Basic NLP preprocessing is applied: the input is lowercased, trimmed, and tokenized to extract financial keywords (e.g., "total", "spending", "week").

2. **Intent Recognition**
   • Keyword-based pattern matching maps user input to one of several financial intents (e.g., check balance, list expenses, ask for savings tip).
   • If no clear match is found, the full query is passed to LLaMA 3 for interpretation.

3. **Prompt Construction**
   • For dynamic responses, the system creates a prompt by combining the user query with contextual financial data (like balance, expenses, overspend status).
   • Example prompt: "My balance is $430. I've spent $70 on food and $90 on transport. Based on this, how am I doing financially?"

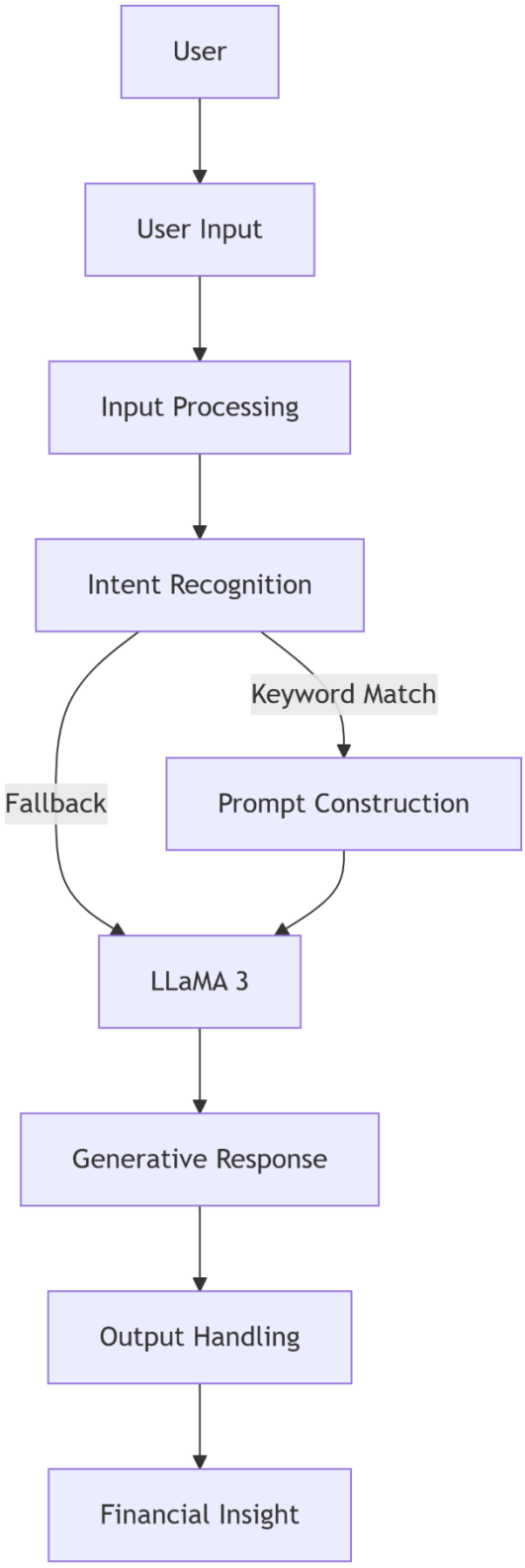
4. **Generative Response using LLaMA 3**
   • The prompt is passed to the local LLaMA 3 model for response generation.
   • LLaMA 3 returns a human-like financial insight, tip, or summary based on real-time data and inferred user intent.

5. **Output Handling**
   • The AI-generated response is post-processed (if necessary) and displayed

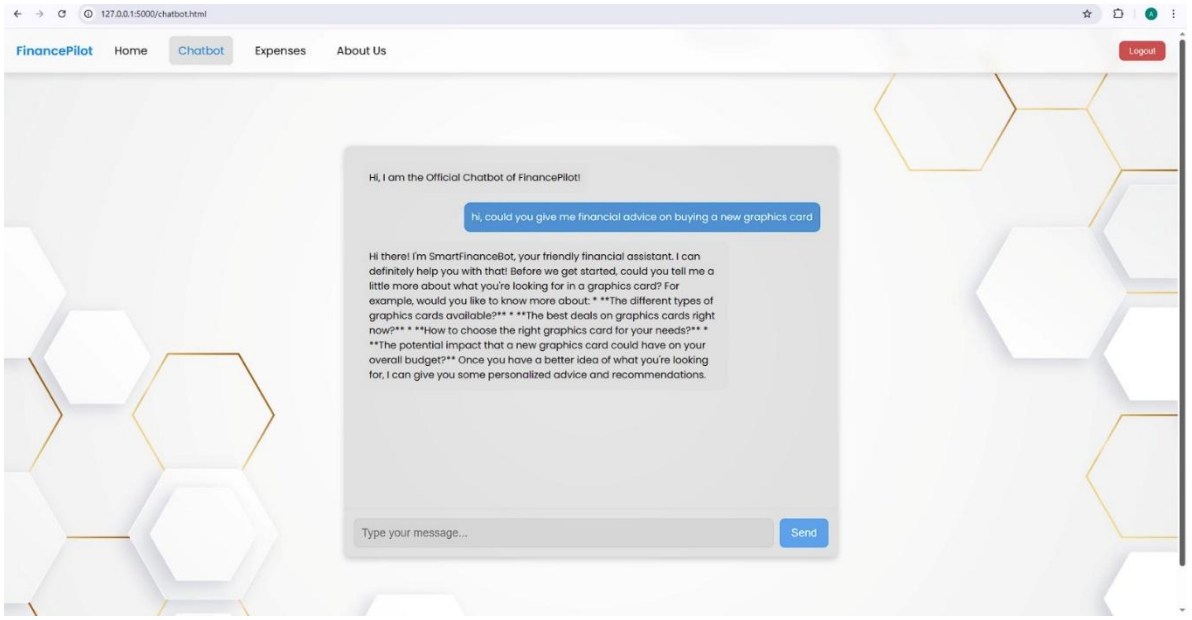
to the user.

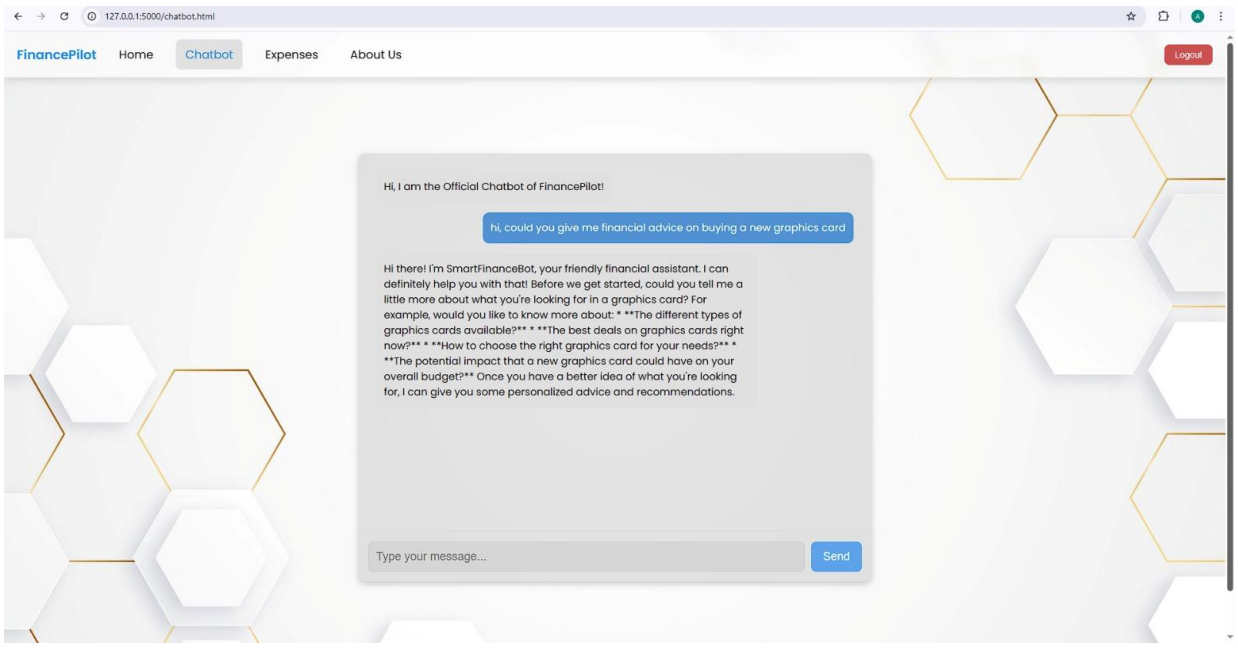
• If the model response is ambiguous or too generic, fallback rule-based messages are used for clarity.

ARCHITECTURE DIAGRAM



OUTPUT





CONCLUSION

FinancePilot showcases the transformative potential of Generative AI in the realm of personal finance management. By combining local deployment of the powerful LLaMA 3 model with real-time financial data and natural language interaction, this project delivers a smart, responsive, and intuitive experience to users. The use of NLP and AI-driven reasoning empowers users to make informed financial decisions through conversational queries. Ultimately, FinancePilot is a step toward the future of AI-assisted personal finance, demonstrating how locally run GenAI solutions can enhance privacy, performance, and personalized assistance.