Chatbot Project Documentation

# Stockbot

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# Introduction

## Overview of the Chatbot

The chatbot is designed to analyze Apple Inc.'s (AAPL) stock performance using Yahoo Finance data. It provides a summary of the stock's performance and visualizations based on user queries.

## Objectives and Scope

The project aims to simplify financial analysis by providing natural language-based stock performance insights. It caters to users interested in Apple stock trends over various time periods.

## List of Dependencies

The project requires the following Python libraries:  
- pandas  
- yfinance  
- matplotlib  
- gradio  
- google-generativeai  
- word2number  
- LangChain

# Project Architecture

The architecture consists of user input processing, data fetching and validation, summary generation using language models, and result presentation with Gradio.

## Modules and Platform Details

The project is modular, consisting of the following key modules:  
- Data Fetching: Using Yahoo Finance API  
- Data Validation: Ensures completeness and accuracy  
- Natural Language Processing: Parses user input and generates summaries using Google's Gemini model  
- Visualization: Generates stock charts using Matplotlib  
- Gradio Interface: Provides an intuitive user interface

# Implementation Details

## Data Flow and Language Model Details

Data flows from user queries to the Yahoo Finance API, followed by preprocessing and analysis. Summaries are generated using Google's Gemini language model, and outputs are displayed via Gradio.

## Integrations

The chatbot integrates the following APIs and libraries:  
- Yahoo Finance (via yfinance)  
- Google's Gemini language model for natural language summaries  
- Gradio for user interaction

## Custom Intents/Entities

The chatbot identifies stock ticker symbols and time periods from user input. It supports natural language descriptions for both.

# Features and Functionalities

- Provides Apple Inc. stock performance summaries  
- Generates visualizations of stock closing prices  
- Handles natural language queries and validates input  
- Displays results via an interactive web interface

# Limitations

## Why we selected Yahoo Finance over Polygon.io for stocks data extraction

Polygon.io provides free data of only 2 years

## Yahoo Finance Limitations

This provides data for only selected period : ['1d', '5d', '1mo', '3mo', '6mo', '1y', '2y', '5y', '10y', 'ytd', 'max']

# Deployment Details

## Hosting Platform and Deployment Steps

The chatbot is hosted on Hugging Face Spaces, leveraging Gradio for deployment.  
Deployment Steps:  
1. Set up Hugging Face Spaces with the repository.  
2. Add necessary API keys and secrets.  
3. Verify deployment and test.

## Post-Deployment Monitoring

Monitoring includes testing responses, API uptime, and user feedback analysis.

# Conclusion

The Stockbot project demonstrates effective integration of APIs, natural language processing, and data visualization. It simplifies financial analysis for users, achieving all stated objectives.