LLM-Powered Sentiment Analysis Web App — Streamlit Integration Guide

Overview

This project is a web-based application for analyzing Amazon reviews using a Local Large Language Model (LLM). The app provides users with insights such as sentiment classification, emotional tone, summary generation, and bias detection using a Hugging Face model and Streamlit for the interface.

Purpose of Using an LLM

Traditional sentiment analysis models classify text using statistical methods. In this project, We used a **transformer-based LLM** (google/flan-t5-base) that understands language contextually. This allows the model to:

- Detect nuanced sentiment
- Detect biased/fake reviews
- Identify emotional tone
- Summarize text meaningfully

This makes the app more intelligent and human-like in its understanding of language.

Technologies Used

Tool	Purpose
Streamlit	UI + Web framework
Transformers	To load flan-t5-base model
Torch	Backend for the model
Pandas	Dataframe and CSV handling
Seaborn + Matplotlib	Visualization (rating charts)

Features of the App

1. **Classify Sentiment**
   Tells you whether a review is **positive**, **neutral**, or **negative.**

2. **Summarize Review**
   Generates a one-line summary of the review content.
3. **Detect Bias or Fake**
   Checks whether a review sounds exaggerated or suspicious.
4. **Tag Emotions**
   Returns up to 3 emotions expressed in the review (e.g., anger, joy).

How to Use the App

1. **Run the App:**
   - Open terminal
   - Navigate to the app folder
   - Run: streamlit run app.py
2. **On the Website:**
   - Upload a CSV with a text column (optional, else defaults will load)
   - View the dataset overview and charts
   - Copy a sample review or paste your own
   - Choose a task (sentiment, summary, etc.)
   - Click “Ask the LLM” to get the result

Installation Requirements

To run this app locally, you need the following Python packages installed (in the terminal):

1. Streamlit
2. Transformers
3. Torch
4. Pandas
5. Seaborn
6. Matplotlib