SmartSent - Sentiment Analyzer Project Report

Project Report: SmartSent - A Streamlit Sentiment Analyzer

Project Title

SmartSent: A Transformer-based Real-time Sentiment Analysis Web App

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Objective

To build an interactive web application using Streamlit that classifies user input text as Positive, Negative, or Neutral using a fine-tuned DistilBERT model. It provides visual feedback using word clouds and keeps a session-based sentiment history.

Project structure

smart_sentiment/

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|---smart_sent.py #Main streamlit app

Project Motivation

In the data-driven world, understanding public opinion, customer feedback, and social sentiment is crucial. This project demonstrates the power of transformer models in analyzing textual sentiments

efficiently and interactively.

Tech Stack

Component	Description
Python	Core programming language
Streamlit	To build and deploy the web application
Transformers (Hugging Face)	For the pre-trained sentiment analysis model
Matplotlib & WordCloud	For visualizing frequent words
Pandas (optional)	For managing tabular history (expandable feature)

System Requirements

Python version: 3.10 or 3.9 (recommended)

OS: Windows / macOS / Linux

Installation Steps

1. Install Python 3.10:

Download from python.org

Add Python to PATH during installation.

2. Create a Project Folder:

mkdir sentiment_app

cd sentiment_app

3. Create a Python File:

Name it smart_sent.py

Paste the final code (below)

4. Install Required Packages:

pip install streamlit transformers matplotlib wordcloud

5. Run the App:

streamlit run smart_sent.py

App Features

Sentiment Detection: Uses a transformer model to detect sentiment (Positive, Negative, Neutral)

Visual Feedback: Emoji-based result display with confidence score

Word Cloud: Graphical display of frequently used words

Session History: Track sentiment results of previously entered texts

Real-Time: Instant result generation with every text submission

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Use Cases

Product review classification

Social media sentiment tracking

Customer service sentiment monitoring

Educational demonstration of NLP models

Model Used

Model: cardiffnlp/twitter-roberta-base-sentiment

Labels Returned: Positive, Negative, Neutral

Provider: Hugging Face Transformers

Future Enhancements (Optional)

Add multilingual support with translation

Include charts (e.g., pie or bar) of sentiment distribution

Export analysis history to CSV

Summary

This project provides a practical application of NLP in understanding sentiment in text data. Its useful for customer analysis, social media listening, and demonstrating the use of transformer models in real-world applications.

Conclusion

SmartSent demonstrates how powerful transformer models can be leveraged for real-time text sentiment analysis within an interactive web application. By combining the capabilities of Hugging Face's pre-trained models and Streamlit's simplicity, we created a practical tool for understanding and visualizing textual emotions.

This application effectively detects positive, negative, and neutral sentiments and provides visualizations like word clouds and confidence scores. It also maintains a session-based history of analyses, making it a useful tool for both casual users and data professionals.

The project bridges academic learning with practical implementation, making it a strong addition to a data science portfolio. With potential for future enhancementssuch as multilingual support, emotion classification, or social media integrationSmartSent lays a solid foundation for innovative NLP applications.