JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune
(An Empower Autonomous Institute under Savitribai Phule Pune University)

Department of Computer Science and Business Systems
Artificial Intelligence Mini Project
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Project Title:
Sentiment Analyzer Chatbot using Gemini AI

Submitted by:

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Introduction

Objective of the Project:

- To design an **AI chatbot** that performs real-time **sentiment analysis**.
- To integrate **Gemini Generative AI API** for intelligent text processing.
- To develop a **user-friendly chat interface** using HTML and CSS.
- To demonstrate how AI can **understand and respond to human emotions** effectively.

Scope:

Applicable in **customer service**, **education**, **healthcare**, and **feedback systems**.
Can detect user mood and adjust responses accordingly.
Serves as the foundation for **emotion-aware AI systems**.
Can be expanded with **voice support** and **database logging** in future versions.

Mapping With SDG Goal:(Provide Name of SDG goal to Which project Maps):

SDG Goal 9 – Industry, Innovation, and Infrastructure
(Promotes innovation and technological development through AI-driven automation.)

Key Features:

- Web-based chatbot interface (Flask backend + HTML frontend)
- Gemini AI integration for intelligent responses
- Real-time **sentiment detection** (Positive, Negative, Neutral)
- JSON-formatted structured responses for data interpretation

Algorithm Used

- **Chosen Algorithm:**
  Google Gemini Generative AI (gemini-1.5-flash)
  Steps:

a) Accept input text from the user.
b) Send input to Gemini API for analysis.
c) AI determines sentiment and generates an appropriate response.
d) Flask receives and displays output to the user.

- **Reason for Selection:**

1. **Advanced Understanding:** Gemini models provide high-quality natural language comprehension and generation.
2. **Built-in Intelligence:** Capable of sentiment analysis and emotionally intelligent replies.
3. **Secure and Reliable:** Developed by Google AI with robust API authentication and rate control.
4. **Speed and Efficiency:** *gemini-1.5-flash* offers fast responses suitable for real-time chatbot interactions.
5. **Context Awareness:** Maintains conversation flow and understands contextual nuances.
6. **Cost-Effective:** The *flash* tier provides strong performance with minimal resource usage — ideal for mini-projects.

- **Advantages:**
- - Efficient performance
- - Easy to implement basic operations

Module

- **List of Module(Provide implementation also)**

Frontend Module (User Interface)
Implementation:
Developed using **HTML, CSS, and JavaScript** to provide a clean, responsive chat layout.
Handles user input and displays real-time chatbot replies in a pastel-colored interface.
•**Backend Module:**
•Flask handles message routing and API integration.
•**AI Processing Module:**
•Gemini API performs sentiment detection and response generation.
•**Response Formatter:**
•Displays JSON-based structured response in user-friendly format.

Methodology & Results

- Methodology:

Problem analysis and system design
API integration and coding using Flask & Gemini
Testing chatbot interaction and sentiment detection
Validation through sample user inputs

• Results & Conclusion:

i. - Successfully detects sentiment and generates AI-based replies
ii. - Lightweight, user-friendly web interface built with HTML & Flask
iii. Future scope: add voice chat, React UI, and database integration

References

- Google AI Developer Documentation – https://ai.google.dev
- Flask Official Documentation – https://flask.palletsprojects.com
- Python Official Documentation – https://docs.python.org
- W3Schools (HTML, CSS, JS Tutorials) – https://www.w3schools.com
- Gemini API Integration Guide – https://ai.google.dev/gemini-api/docs
- Tailwind CSS Reference – https://tailwindcss.com *(for UI design styling concepts)*