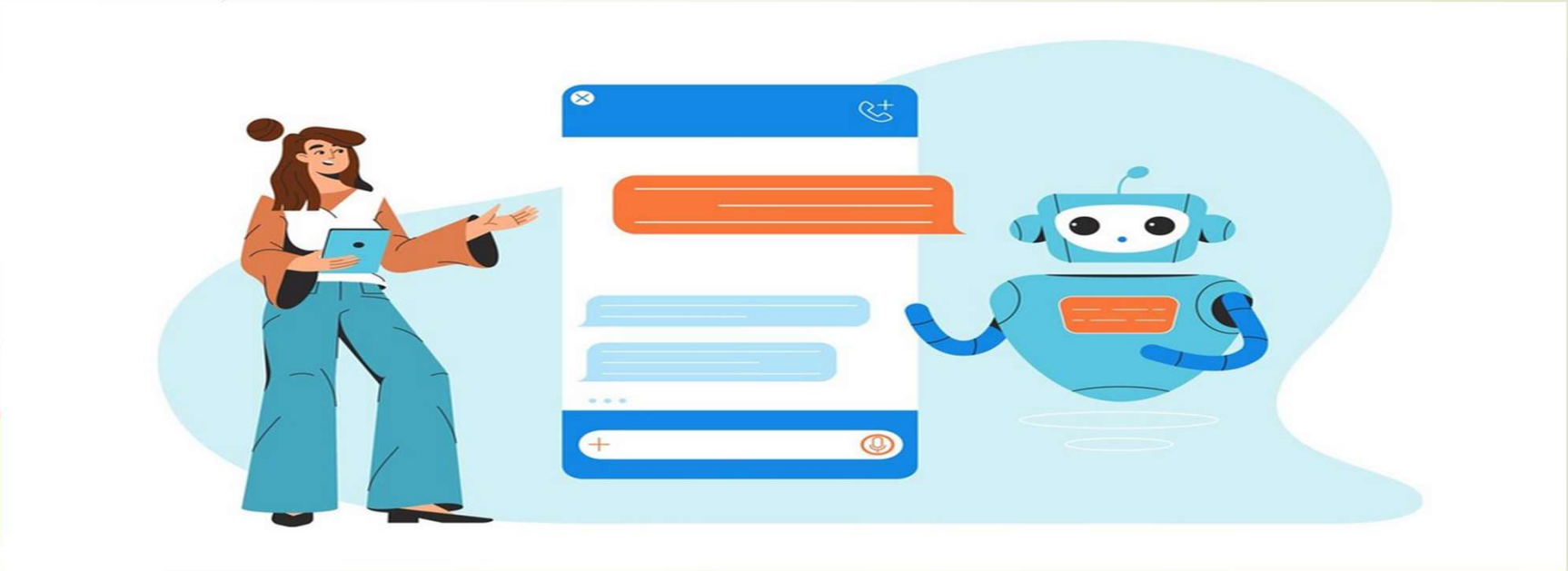
STREAMLIT-POWERED CHATBOT WITH GPT-4 INTEGRATION



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INTRODUCTION

- **Project Overview**:
  - Develop a web-based chatbot using Streamlit and GPT-4 API.
  - Implement a visually appealing UI with a shaded blue gradient.
- **Purpose**:
  - Create an interactive chatbot to answer user queries.
- **Technologies Used**:
  - Streamlit, Python, OpenAI GPT-4 API, CSS for styling.

DESIGN - PROBLEM IDENTIFICATION

Why This Approach?

- **Problem Identified**:

  - ✓ Need for Efficient Human-Computer Interaction
  - ✓ Demand for Scalable and User-Friendly Interfaces
  - ✓ Maintaining Conversational Context
  - ✓ Integrating Real-Time Response Generation
  - ✓ Customizing User Experience with Visual Appeal
  - ✓ Accessibility and Deployment Challenges
  - ✓ Future Proofing and Scalability

- **Solution Requirements**:

  - ✓ A simple, scalable, web-based chatbot.
  - ✓ Integration with GPT-4 for dynamic responses.
  - ✓ Custom background for enhanced UX.

DESIGN - INVESTIGATING SOLUTIONS

Possible Solutions:

- ❑ **Option 1**: Building a custom backend API and web interface from scratch.
- ❑ **Option 2**: Using pre-built web frameworks like Streamlit or Flask.

Chosen Approach:

- ✓ **Streamlit** for faster prototyping and simplicity.
- ✓ **OpenAI GPT-4 API** for powerful, real-time response generation.
- ✓ **CSS Styling** for enhancing user experience.

IMPLEMENTATION - HOW IT WAS BUILT

Code Setup:

1. Using **Python** to manage OpenAI API integration.

1. **CSS**: Applied for custom gradient background and "Powered by Streamlit" footer.

1. **Session Management**: Streamlit’s session state to manage chat history.

1. **API Streaming**: Real-time response streaming with OpenAI's GPT-4.

TESTING - CHATBOT FUNCTIONALITY

Testing Steps:

- Tested for different user inputs to ensure meaningful responses.
- Verified session persistence (conversation history stored).
- Ensured background and footer styling is consistent across all devices.

Test Cases:

- Short queries vs. complex queries.
- Checking response generation speed (around 2-3 seconds for complete response)
- Verifying correct CSS rendering.

ENHANCEMENT IDEAS

Improvements to Consider:

- **Voice Input**: Integrating speech-to-text for voice queries.
- **Multiple Models**: Allow users to choose between different OpenAI models.
- **Analytics Dashboard**: Add metrics to track user interaction with the chatbot.
- **Dark Mode**: Implement a toggle between light and dark themes.

CONCLUSION

- ✓ Successfully developed a chatbot using Streamlit and OpenAI’s GPT-4 API.
- ✓ Implemented session handling and styled the UI with a gradient background.
- ✓ Streamlit's ease of use facilitated rapid development.
- ✓ GPT-4 API provided strong, real-time conversational capabilities.

REFERENCES

Technologies Researched:

- **Streamlit Documentation**: Used for web app framework setup.
- **OpenAI API Documentation**: For integration of GPT-4 model.
- **CSS Gradients**: Researched gradient styling techniques.

Information Literacy Search Technique:

- Searched for chatbot technologies, real-time streaming, and web development frameworks.
- OpenAI_API_ChatBot_Streamlit

APPENDIX

chatbot.py

chatbot_streamlit > chatbot.py > ...

```python
import streamlit as st  # type: ignore
import openai, os
from dotenv import load_dotenv

# Load environment variables for OpenAI API key
load_dotenv()
openai.api_key = os.getenv("OPENAI_API_KEY")  # Set the API key

# Title of the chatbot
st.title("My GPT-4o-mini Chatbot 🤖")

# CSS for full-page shaded blue gradient background
st.markdown(
    """
    <style>
    /* Apply the gradient to the whole page */
    html, body, .stApp {
        height: 100%;
        background: linear-gradient(135deg, #004c92, #000428); /* Shaded blue gradient */
        color: white; /* Text color for readability */
        /* Footer style */
    }
    </style>
    """,
    unsafe_allow_html=True
)

# Initialize messages in the session state
if "messages" not in st.session_state:
    st.session_state.messages = []

# Display messages
for message in st.session_state["messages"]:
    with st.text(message["role"]):
        st.markdown(message["content"])

# Handle user input and OpenAI response
if user_prompt := st.text_input("How can I help you?"):
    st.session_state.messages.append({"role": "user", "content": user_prompt})

    # Display user message
    with st.text("user"):
        st.markdown(user_prompt)

    # Assistant response
    with st.text("assistant"):
        chatbot_msg = st.empty()
        full_response = ""
        stream = openai.ChatCompletion.create( # type: ignore
            model="gpt-4o-mini",
            messages=[
                {"role": msg["role"], "content": msg["content"]}
                for msg in st.session_state["messages"]
            ],
            temperature=0,
            stream=True,
        )

        # Stream the response
        for chunk in stream:
            token = chunk.choices[0].delta.get("content")
            if token is not None:
                full_response = full_response + token
                chatbot_msg.markdown(full_response)

        chatbot_msg.markdown(full_response)

    # Store assistant's response in session
    st.session_state.messages.append({"role": "assistant", "content": full_response})
```

```
# CSS for full-page shaded blue gradient background
st.markdown(
    """
    <style>
    /* Apply the gradient to the whole page */
    html, body, .stApp {
        height: 100%;
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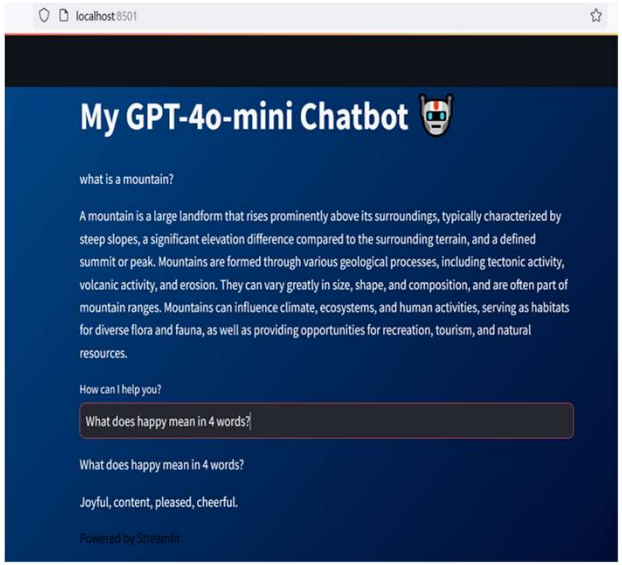

THANK YOU