

Project Report: AI Chatbot using Gemini API

Introduction:

Artificial Intelligence (AI) has significantly transformed how humans interact with machines. One prominent application of AI is the chatbot—a system capable of simulating human conversation. This project focuses on developing a web-based AI chatbot using **HTML**, **CSS**, and **JavaScript**, integrated with Google's **Gemini API** (formerly Bard API) to provide intelligent and dynamic responses. The chatbot is designed to answer user queries in real-time, offering a conversational experience directly through the browser.

Abstract:

The goal of this project is to create a responsive and intelligent chatbot interface that utilizes a powerful language model. By leveraging Google's Gemini API, the chatbot can understand natural language input and generate human-like responses. The chatbot interface is built using standard web development tools and demonstrates how easily AI capabilities can be integrated into frontend applications. The project highlights the synergy between simple frontend technologies and powerful backend AI APIs, resulting in an effective and engaging user experience.

Tools Used:

HTML: Structure of the web application

CSS: Styling the chatbot UI

JavaScript: Handling user input and API communication

Gemini API: Generate AI based responses

VS Code: Code editing environment

Steps involved in building the project:

1. UI Design with HTML & CSS:

- Created a clean and responsive chat interface with input box, send button, and chat display area.
- Styled using CSS to ensure usability on both desktop and mobile devices.

2. Setting Up Gemini API:

- Registered and obtained an API key from Google Cloud Console.
- Configured API endpoint and authentication.

3. JavaScript Integration:

- Captured user input using event listeners.
- Sent input as a POST request to the Gemini API using `fetch()` or `axios`.
- Handled API responses and displayed them in the chat window.

4. Asynchronous Communication:

- Implemented `async` functions to handle network delays and improve UX.
- Added loading indicators while waiting for a response.

5. Testing & Debugging:

- Tested the chatbot with different prompts.
- Handled edge cases like empty messages, API errors, and user interruptions.

CONCLUSION:

This project demonstrates how a simple yet functional AI chatbot can be built using foundational web technologies and enhanced with powerful AI capabilities through the Gemini API. It combines frontend development with cloud-based AI, providing an interactive solution for conversational applications. This project can be further improved by adding features like voice input, user authentication, or storing chat history. Overall, it reflects the growing accessibility of AI tools and their integration into web development.