

**AI-Powered Intelligent Assistant System**

Database Systems (DBS) - 2nd Semester Project

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# Project Overview & Objectives

## Project Title:

AI Chatbot DBS

## Course:

Database Systems (DBS) – 2nd Semester Project

## Team Members:

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## Instructor:

[Miss Samreen Javed]

## Project Overview:

In today’s data-driven environment, integrating advanced AI with robust database systems can revolutionize how users interact with information. Our DBS semester project aims to demonstrate the use of natural language processing (NLP), real-time interaction, and powerful data handling to create a smart assistant capable of answering queries, holding contextual conversations, and accessing structured data.

## Project Objectives:

- Develop a user-friendly intelligent assistant with smooth, real-time dialogue.  
- Utilize state-of-the-art NLP models for smart and contextual responses.  
- Implement a relational database (PostgreSQL) to handle data-driven queries.  
- Learn to integrate frontend, backend, and AI models efficiently.

## TECH USED IN PROJECT: 1. OpenAI Framework:

It's used to create ai conversational application, ai agent and chatbot.  
  
**Role in Project:**  
- Converts user input into meaningful queries  
- Handles contextual and intelligent responses  
- Powers language understanding and response generation

## 2. Chainlit UI:

Chainlit is a real-time UI framework built specifically for LLM applications. It allows developers to quickly prototype and deploy interactive NLP applications with a chat-like interface.  
  
**Role in Project:**  
- Provides a smooth, live chat interface  
- Facilitates real-time user interaction  
- Simplifies frontend/backend communication

## 3. Gemini Model:

We also explored Google’s Gemini model, which complements OpenAI by providing more context-aware dialogue and deeper reasoning capabilities.  
  
**Role in Project:**  
- Enhances contextual awareness in conversation  
- Offers diverse outputs for complex queries  
- Improves dialogue coherence and relevance

## 4. PostgreSQL:

A powerful, open-source relational database that supports advanced queries and large-scale data processing. PostgreSQL was used to store and retrieve data that the assistant needed to access.  
  
**Role in Project:**  
- Stores structured data (e.g., user records, FAQs, product info)  
- Executes complex queries based on AI-generated input  
- Ensures data reliability and efficiency

## 5. System Workflow:

1. User Input: User interacts via Chainlit UI.  
2. NLP Interpretation: Input is passed to the OpenAI/Gemini model for natural language processing.  
3. Query Generation: The model determines if the response requires database access.  
4. Database Interaction: SQL queries are generated and executed via PostgreSQL.  
5. Response Formation: Results are formatted into a user-friendly reply and sent back via the UI.

## Conclusion:

This project provided practical experience in combining AI with database systems. We learned how to structure queries, manage real-time UI, and apply cutting-edge NLP technology. It was a successful demonstration of how future systems can leverage both smart language models and robust databases for interactive applications.