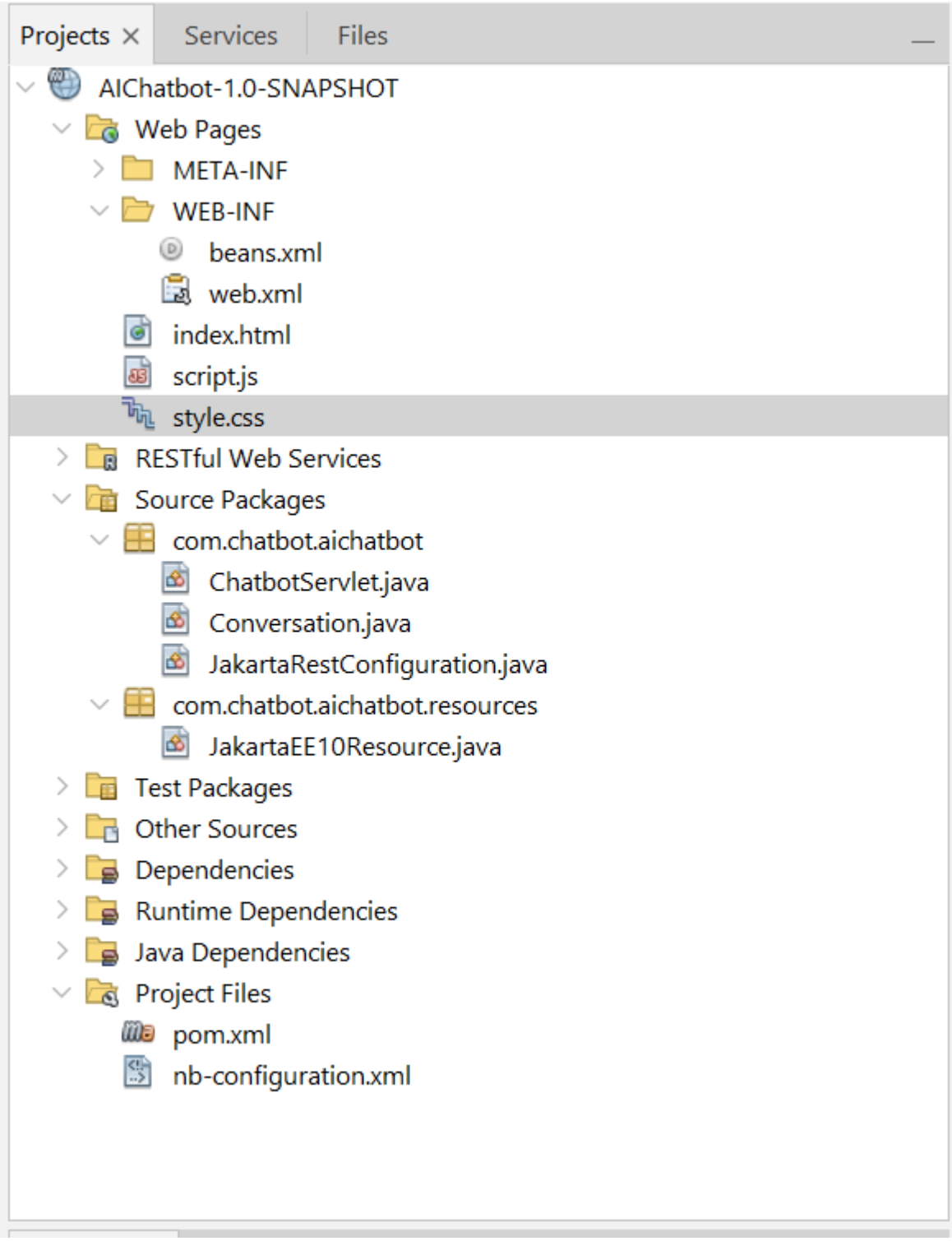
Name: Gurjit Singh **Sid:N01634963**

Documentation for Lab4:

1. Overall Design

The AI Chatbot Web Application follows the Model-View-Controller (MVC) architecture pattern. This architecture ensures a clean separation of concerns between the user interface, business logic, and data access components. The project is structured as a Maven-based Java Web application using Apache Tomcat 10 for deployment and Jakarta EE for building web components.

- **Model:** Handles data representation and logic (e.g., Conversation.java).
- **View:** The frontend components that present information to the user (index.html, style.css, script.js).
- **Controller:** Manages the flow of the application (ChatbotServlet.java, RESTful services).



2. Frontend Components (HTML, JavaScript, CSS)

- **index.html:**
    - Serves as the main entry point for the chatbot interface.

- Includes an input field for user queries and a display area for chat responses.

- **script.js:**
  - Handles client-side logic, such as capturing user input, sending AJAX requests to the server, and updating the UI with chatbot responses.
  - Manages asynchronous communication between the frontend and backend using XMLHttpRequest or Fetch API.

- **style.css:**

- Provides the styling for the chatbot interface, ensuring a user-friendly and visually appealing design.
- Styles elements like the chat window, input box, and buttons to enhance the user experience.

3. Chatbot Logic

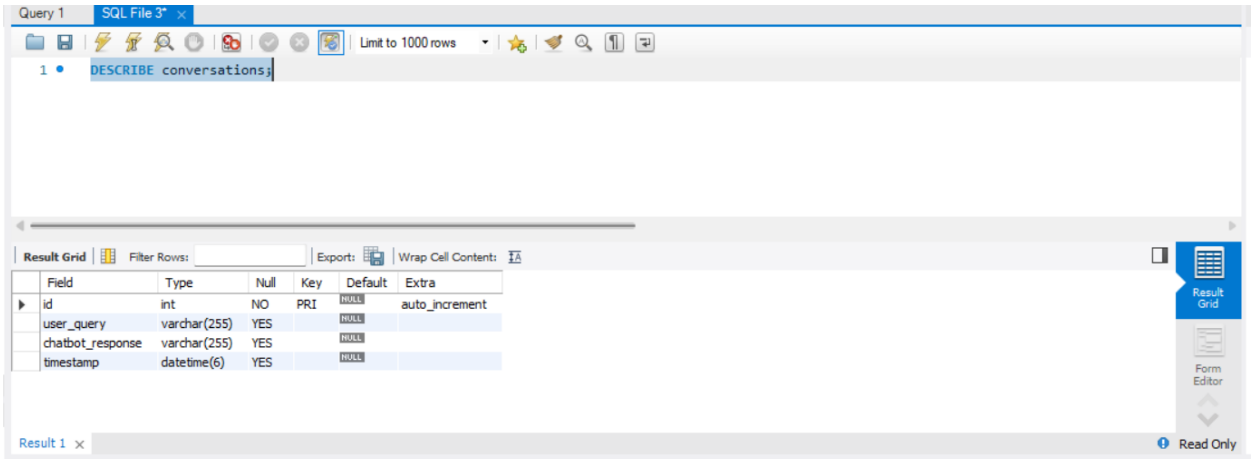
- **ChatbotServlet.java:**
  - Acts as the primary servlet handling HTTP requests from the frontend.
  - Processes user input, invokes chatbot logic, and returns appropriate responses.
  - Integrates with backend logic (Conversation.java) to manage conversations and generate replies.
- **Conversation.java:**
  - Defines the logic for interpreting user inputs and formulating responses.
  - Can be extended to include more complex NLP (Natural Language Processing) techniques for advanced interactions.
- **RESTful Web Services:**
  - Provides RESTful endpoints for interaction between the frontend and backend.
  - Managed by classes in the com.chatbot.aichatbot.resources package

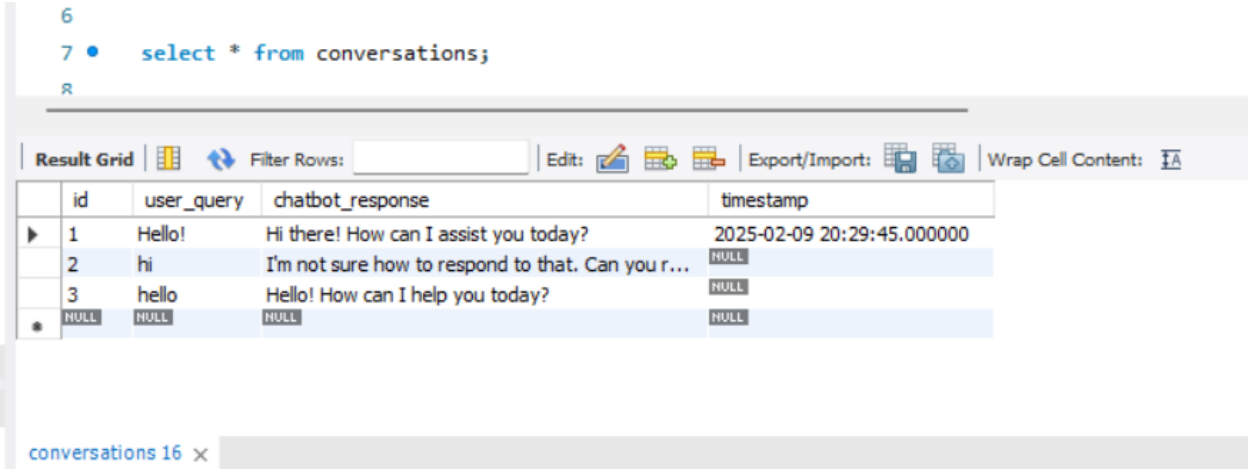
4. Database Schema and Functionality

- **Database Configuration:**
  - The application connects to a MySQL database using JDBC.

- Configuration details are defined in beans.xml and web.xml files located in the WEB-INF folder.

- **Schema:**
  - **users** table: Stores user credentials and profile information.
    - id (INT, PRIMARY KEY, AUTO_INCREMENT)
    - username (VARCHAR)
    - password (VARCHAR)
    - email (VARCHAR)
  - **conversations** table: Logs user conversations for history and analytics.
    - id (INT, PRIMARY KEY, AUTO_INCREMENT)
    - user_id (INT, FOREIGN KEY references users.id)
    - message (TEXT)
    - response (TEXT)
    - timestamp (DATETIME)

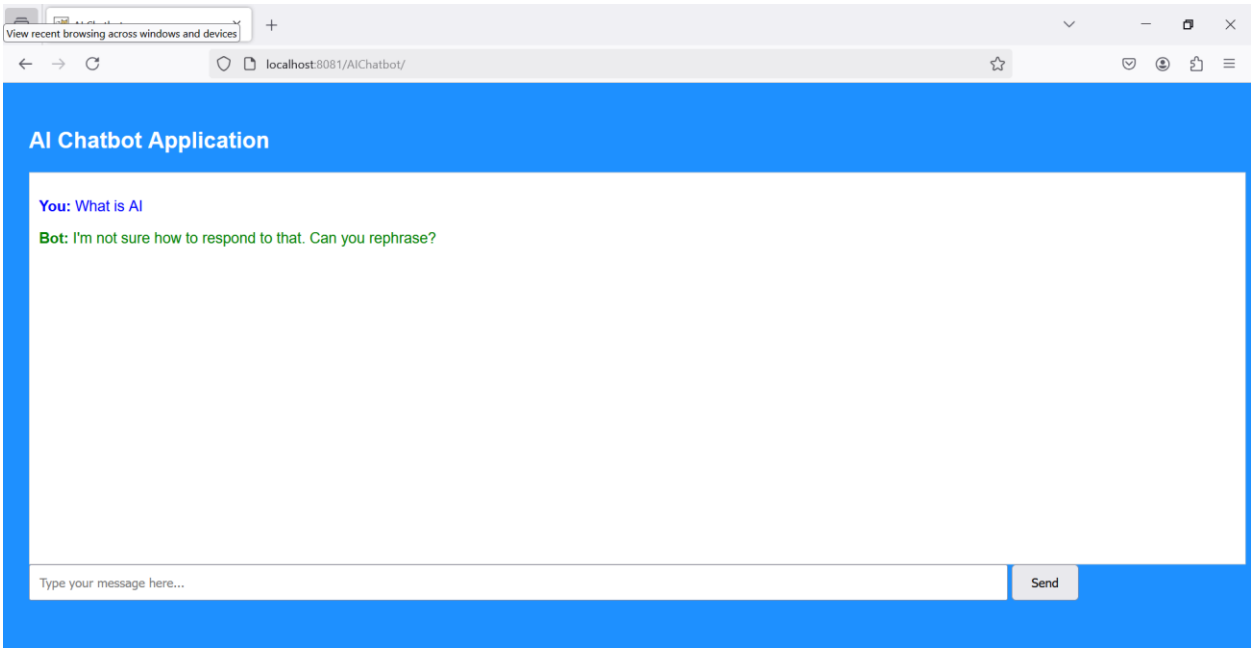


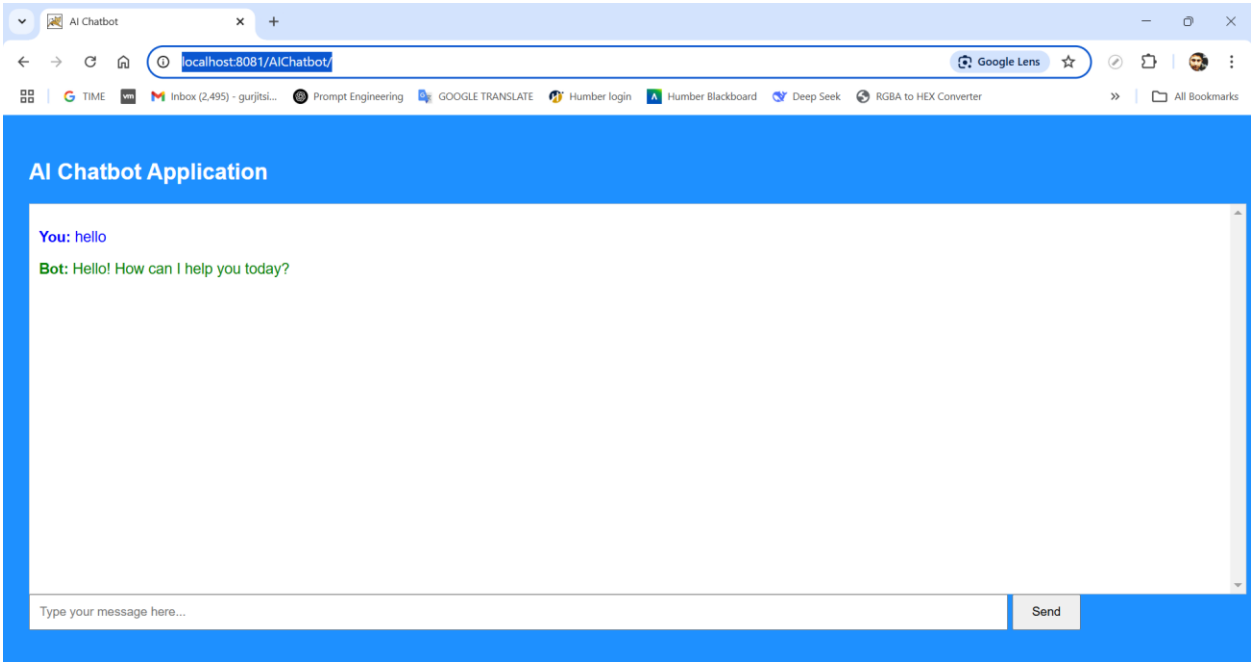


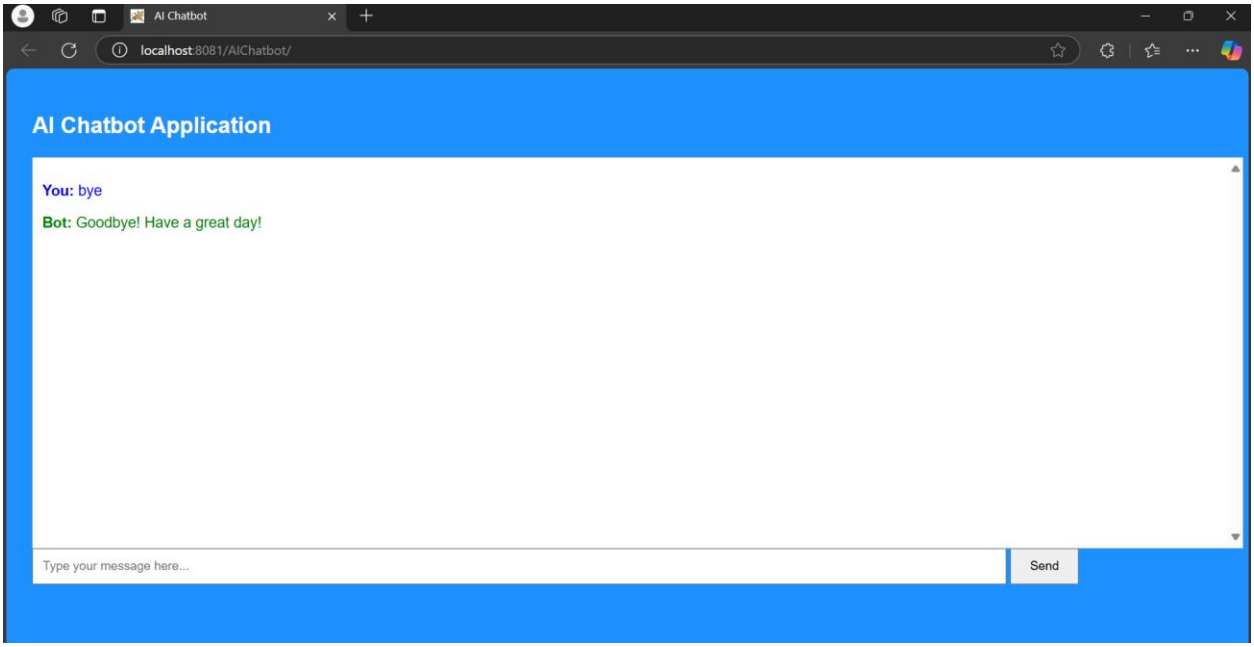
- **Functionality:**
    - User registration and authentication.
    - Logging of each conversation for future analysis.
    - Retrieval of conversation history for personalized responses.

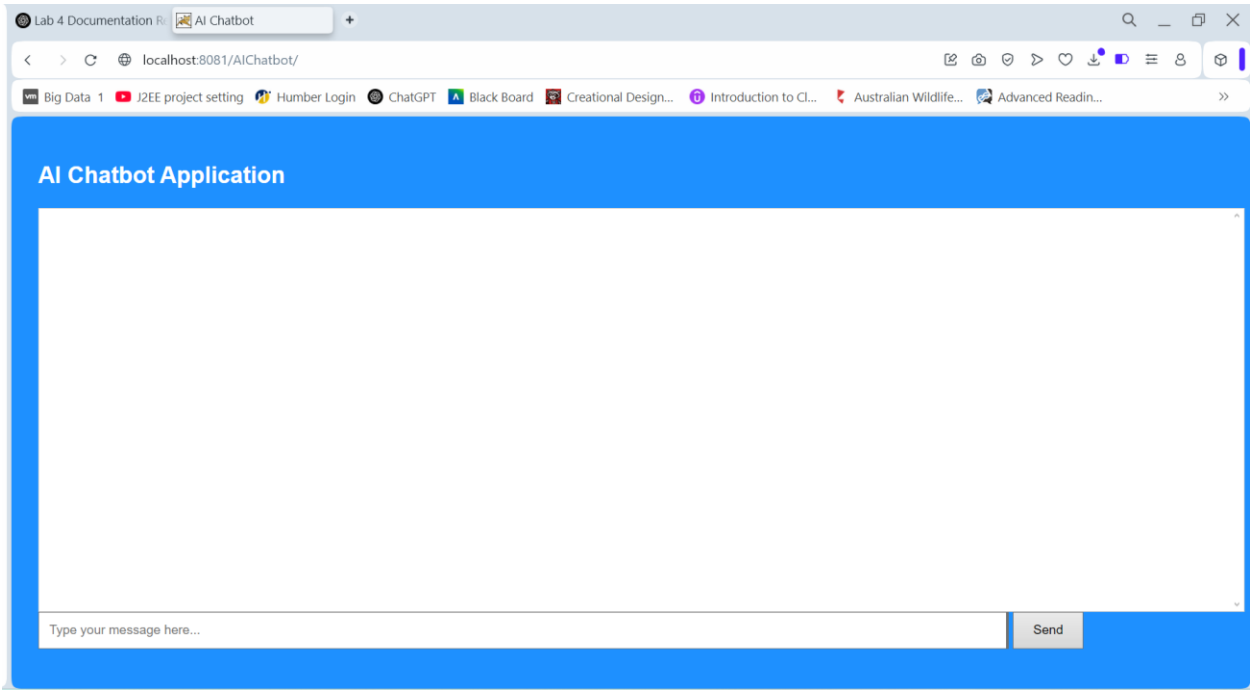
Conclusion

This AI Chatbot Web Application integrates a structured MVC architecture, user-friendly frontend components, robust chatbot logic, and a well-defined database schema to deliver an interactive and efficient user experience. The modular design allows for easy scalability and future enhancements, such as adding advanced NLP features or integrating external APIs.


View recent browsing across windows and devices
localhost:8081/AIChatbot/
AI Chatbot Application
You: What is AI
Bot: I'm not sure how to respond to that. Can you rephrase?
Type your message here...
Send


AI Chatbot
localhost:8081/AIChatbot/
Google Lens
TIME
Inbox (2,495) - gurjitsi...
Prompt Engineering
GOOGLE TRANSLATE
Humber login
Humber Blackboard
Deep Seek
RGBA to HEX Converter
All Bookmarks
AI Chatbot Application
You: hello
Bot: Hello! How can I help you today?
Type your message here...
Send


AI Chatbot
localhost:8081/AIChatbot/
AI Chatbot Application
You: bye
Bot: Goodbye! Have a great day!
Type your message here...
Send


Lab 4 Documentation
AI Chatbot
localhost:8081/AIChatbot/
Big Data 1
J2EE project setting
Humber Login
ChatGPT
Black Board
Creational Design...
Introduction to Cl...
Australian Wildlife...
Advanced Readin...
AI Chatbot Application
Type your message here...
Send