VI Semester B.Tech. (CSE) | Winter Semester (2023-2024)

Computer Networks Lab (CSC307)

List of experiments for 23rd Jan 2024:

1. Design and implement a robust n-way chat system using socket programming. In your program, address the following aspects:
   - The server should able to handle incoming client connections, that mange by multiple clients using threads. And broadcasts messages to all connected clients.
   - Client should able to both send and receive messages concurrently.

2. A rules-based Chabot operates on a set of predefined rules to interpret user input and generate responses. Let's walk through a simple example of a rules-based Chabot for customer support. This Chabot will recognize intents such as greetings, inquiries about product information, and handling common FAQs.

   Example Rules-Based Chabot:

   1. Define Intents:

   - **Greetings:**
     - Recognize user greetings like "hello," "hi," or "hey."
   - **Product Information:**
     - Identify queries related to product information, such as "Tell me about product X" or "What features does product Y have?"
   - **FAQs:**
     - Handle frequently asked questions like "What are your business hours?" or "How can I contact support?"

   2. Rule-based Responses:

   - **Greetings:**
     - Rule: If user input contains greetings, respond with a friendly greeting.
       - Example:
         - User: "Hello!"
         - Chabot: "Hi there! How can I assist you today?"
   - **Product Information:**
     - Rule: If the user asks about product information, provide relevant details.
       - Example:
         - User: "Tell me about your latest smartphone."
         - Chabot: "Our latest smartphone is the XYZ model, featuring a high-resolution camera and a long-lasting battery."
   - **FAQs:**
     - Rule: If the user asks a common question, respond with the appropriate answer.
       - Example:
         - User: "What are your business hours?"

        - Chabot: "Our business hours are Monday to Friday, 9:00 AM to 5:00 PM."

3. Error Handling:

- Rule: If the user input is unclear or doesn't match any predefined intent, respond with a clarification message.
    - Example:
        - User: "Tell me stuff."
        - Chabot: "I'm sorry, I didn't understand. Could you please provide more details or ask a specific question?"

4. Feedback Mechanism:

- Rule: If the user provides feedback, acknowledge and thank them.
    - Example:
        - User: "Your service is great!"
        - Chabot: "Thank you for your kind words! We're here to help. Is there anything specific you'd like assistance with?"

Example Interaction:

1. User: "Hi!"
    - Chabot: "Hello there! How can I assist you today?"
2. User: "What features does your latest laptop have?"
    - Chabot: "Our latest laptop comes with a high-performance processor, a sleek design, and a long-lasting battery."
3. User: "What's your return policy?"
    - Chabot: "Our return policy allows for returns within 30 days of purchase. Please visit our website for more details."
4. User: "Tell me stuff."
    - Chabot: "I'm sorry, I didn't understand. Could you please provide more details or ask a specific question?"
5. User: "Your service is great!"
    - Chabot: "Thank you for your kind words! We're here to help. Is there anything specific you'd like assistance with?"

This example illustrates how a rules-based Chabot uses predefined rules to handle different user inputs and generate appropriate responses. The rules are designed to cover greetings, specific queries, FAQs, and error handling.

Design and implement a rules-based Chabot using socket programming, where the server is responsible for handling client queries based on a predefined set of rules and descriptions. The server should incorporate the following components: Define Intents, Rule-based Responses, Error Handling, and Feedback Mechanism. The goal is to have the server respond with the appropriate description based on the client's input.

Requirements:

1. **Socket Communication:**

- Implement a server and a client using socket programming to establish communication.

2. **Define Intents:**
   - Identify and define at least three distinct user intents. Examples could include greetings, product information inquiries, or FAQs.
3. **Rule-based Responses:**
   - Create rules for each intent to trigger specific responses. These rules should be based on keywords, patterns, or regular expressions.
4. **Error Handling:**
   - Implement rules to handle situations where the server doesn't understand the client's input or encounters errors. Provide appropriate error responses.
5. **Feedback Mechanism:**
   - Include a mechanism for the client to provide feedback on the Chabot's responses.

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