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SE-Comps B/Batch C

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OS Experiment 8: Shared Memory

(All source code files are submitted on moodle)

Problem statement: Create a Chat Bot using Shared Memory in Linux

In this assignment, you will implement a chat bot using shared memory in Linux. The chat bot should communicate with the user using the shared memory segment and respond to the user's messages based on the pre-defined rules.

Here are the steps to follow:
1. Define the message format: Decide on the message format that will be used to communicate between the chat bot and the user. For example, the message format could be a string with a pre-defined prefix for the chat bot's response.
2. Create a shared memory segment: Use System V IPC mechanisms to create a shared memory segment. Use the shmget() function to create the shared memory segment and get a shared memory identifier.
3. Attach to the shared memory segment: Use the shmat() function to attach to the shared memory segment and get a pointer to the shared memory segment.
4. Implement the chat bot logic: Write code that listens for messages from the user and responds appropriately based on pre-defined rules. For example, if the user sends a message starting with "Hi", the chat bot could respond with "Hello, how can I help you today?".
5. Send the chat bot's response: After the chat bot has generated a response, write the response to the shared memory segment.
6. Wait for the user's next message: After writing the response to the shared memory segment, wait for the user to send the next message.
7. Detach from the shared memory segment: Use the shmdt() function to detach from the shared memory segment.
8. Clean up the shared memory segment: When the chat bot is done, use the shmctl() function to delete the shared memory segment.

Files used: *sharedmem_chatbot.c*

Output:


```
shubhan@Shubhan:~/programs/OS$ ./shmcb
server process initiated with pid = 4067
client process initiated with pid = 4068
you may start typing a message
User: Hi
Chatbot: Hello!
User: Are you the chatbot i made for OS exp 8?
Chatbot: Yes, I am your submission for OS exp 8
User: How many statements did I program you to answer
Chatbot: You programmed me to answer a total 9 differnet questions
User: So i have to type 10 questions, right?
Chatbot: Yes, 9 to show that you hardcoded answers to 9 questions, and 1 to show the deault case.
User: Do you think writing these questions and answers must have been boring?
Chatbot: Yeah, i think so.
User: Did you know i did this while i was travelling in a train
Chatbot: How would I know, am i supposed to?
User: Now i have to remember all these questions too, ::sad_face
Chatbot: You should have thought of this, this was a very stupid decision
User: Don't you lecture me, I am the one writing both the questions and answers
Chatbot: Please refrain from emotionally charged statements in prompts, i am not a large language model developed by openAI,
 i am not designed to answer such questions.
User: Was that 9 questions?
Chatbot: Yes. Congratulations!! You made it through.
User: lol
Chatbot: Invalid prompt
shubhan@Shubhan:~/programs/OS$ |
```