

# Chat system - code

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# -----  
# Message Class  
# -----  
class Message:  
    message_counter = 1 # simple counter  
  
    def __init__(self, sender, content):  
        self.sender = sender  
        self.content = content  
        self.id = Message.message_counter  
        Message.message_counter += 1  
  
    def __str__(self):  
        return f"({self.id}) {self.sender.username}: {self.content}"  
  
# -----  
# User Class  
# -----  
class User:  
    def __init__(self, username):  
        self.username = username  
        self.chatroom = None  
  
    def join_chatroom(self, chatroom):  
        if self.chatroom:  
            print(f"{self.username} is already in a chatroom.")  
        else:  
            chatroom.add_user(self)  
            self.chatroom = chatroom  
            print(f"{self.username} joined {chatroom.name}")  
  
    def leave_chatroom(self):  
        if not self.chatroom:
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amanmomin012@gmail.com

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        print(f"{self.username} is not in any chatroom.")
    else:
        self.chatroom.remove_user(self)
        print(f"{self.username} left {self.chatroom.name}")
        self.chatroom = None

def send_message(self, content):
    if not self.chatroom:
        print(f"{self.username} cannot send a message (not in a chatroom).")
    else:
        self.chatroom.broadcast(self, content)

# -----
# ChatRoom Class
# -----
class ChatRoom:
    def __init__(self, name):
        self.name = name
        self.users = []
        self.messages = []

    def add_user(self, user):
        self.users.append(user)

    def remove_user(self, user):
        self.users.remove(user)

    def broadcast(self, sender, content):
        message = Message(sender, content)
        self.messages.append(message)
        print(message) # Show message to all users

    def show_chat_history(self):
        print(f"\nChat History of {self.name}:")
        for msg in self.messages:
            print(msg)

```

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print()

# -----
# Example Usage
# -----
if __name__ == "__main__":
    room = ChatRoom("Python Lounge")

    u1 = User("Alice")
    u2 = User("Bob")
    u3 = User("Charlie")

    u1.join_chatroom(room)
    u2.join_chatroom(room)

    u1.send_message("Hello everyone!")
    u2.send_message("Hi Alice!")

    u3.join_chatroom(room)
    u3.send_message("Hey guys, what's up?")

    room.show_chat_history()

    u1.leave_chatroom()
    u2.leave_chatroom()
    u3.leave_chatroom()

```