

# 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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        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 chatroo  
m.)")  
        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)
```

```
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()
```