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Build and Start the Docker Containers

Use Docker Compose to build and start the chat-server and chat-client.

`docker-compose up --build`

1. This command will:
 - Build the Docker images for chat-server and chat-client.
 - Start the chat-server container and a chat-client container connected to it.

Running Multiple Clients:

To simulate multiple clients, open new terminals and use the following command for each new client instance:

`docker-compose run -it chat-client`

Each new terminal will start a new chat-client instance connected to the same chat-server.

Interacting with the Application

Once a chat-client instance starts, you'll see an interactive menu with the following options:

1. Create Room
2. List Rooms
3. Join Room
4. Leave Room
5. Send Message
6. View Messages

0. Exit

You can select options by entering the corresponding number.

When you're done testing, you can stop all containers by pressing Ctrl+C in the terminal where `docker-compose up` was run, or by executing `docker-compose down`

Test Cases

- **TC-01:** Start chat server
 - **Expected:** Server starts successfully

- **Result:** Server started
 - **Status:** Pass
- **TC-02:** Connect a single client
 - **Expected:** Client connects successfully
 - **Result:** Client connected
 - **Status:** Pass
- **TC-03:** Create a room
 - **Expected:** Room is created successfully
 - **Result:** Room created
 - **Status:** Pass
- **TC-04:** Create a room with an existing name
 - **Expected:** Error message indicating room exists
 - **Result:** Error shown
 - **Status:** Pass
- **TC-05:** List rooms when rooms exist
 - **Expected:** Rooms are listed correctly
 - **Result:** Rooms listed
 - **Status:** Pass
- **TC-06:** List rooms when no rooms exist
 - **Expected:** Empty room list is shown
 - **Result:** Empty list shown
 - **Status:** Pass
- **TC-07:** Join a room
 - **Expected:** Client joins room successfully
 - **Result:** Client joined
 - **Status:** Pass
- **TC-08:** Join a non-existent room
 - **Expected:** Error message indicating no such room
 - **Result:** Error shown
 - **Status:** Pass
- **TC-09:** Leave a room
 - **Expected:** Client leaves room successfully
 - **Result:** Client left
 - **Status:** Pass
- **TC-10:** Leave a room that doesn't exist
 - **Expected:** Error message indicating no such room
 - **Result:** Error shown
 - **Status:** Pass
- **TC-11:** Send a message in an existing room
 - **Expected:** Message sent successfully
 - **Result:** Message sent
 - **Status:** Pass
- **TC-12:** Send a message in a non-existent room
 - **Expected:** Error message indicating no such room

- **Result:** Error shown
 - **Status:** Pass
- **TC-13:** Retrieve messages in a room with messages
 - **Expected:** Messages displayed correctly
 - **Result:** Messages retrieved
 - **Status:** Pass
- **TC-14:** Retrieve messages in an empty room
 - **Expected:** Empty message list shown
 - **Result:** Empty list shown
 - **Status:** Pass
- **TC-15:** Multiple clients create and join rooms
 - **Expected:** Rooms and clients handled correctly
 - **Result:** Rooms and clients work
 - **Status:** Pass
- **TC-16:** Network connectivity loss and reconnection
 - **Expected:** Client reconnects without issues
 - **Result:** Client reconnects
 - **Status:** Pass
- **TC-17:** Server shutdown and restart
 - **Expected:** Server restarts, state resets
 - **Result:** Server restarts
 - **Status:** Pass