

ChatApplication

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@version Java 21

Description

The Chat Application facilitates real-time communication between client and a server. Client and server can exchange messages.

To Run

Compile the application from bin directory:

```
jar -cf ChatApp.jar *
```

Server is run from console at .jar file directory:

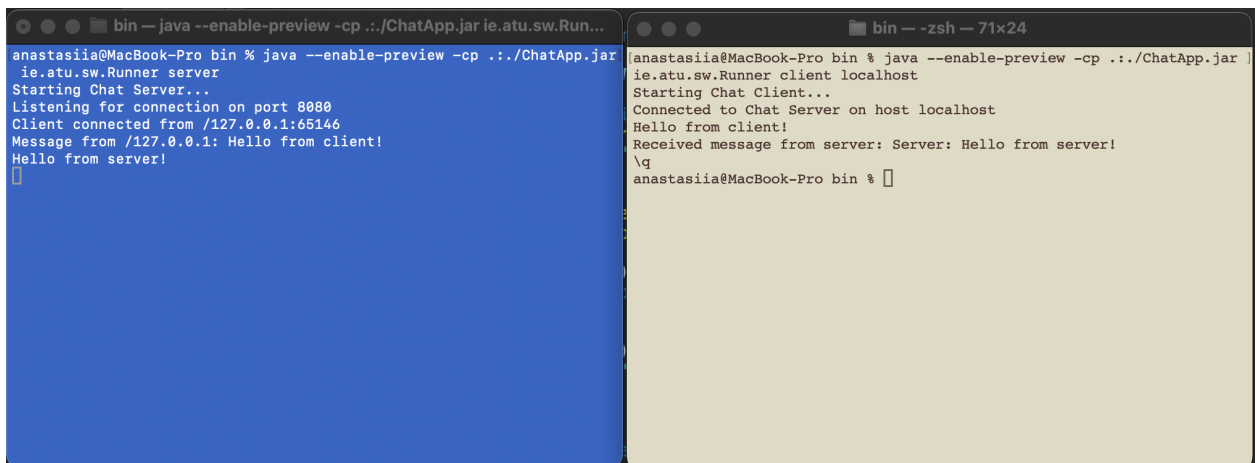
```
java --enable-preview -cp ../ChatApp.jar ie.atu.sw.Runner server
```

Client is run from console (separate from server terminal) at .jar file directory:

```
java --enable-preview -cp ../ChatApp.jar ie.atu.sw.Runner client localhost
```

Process overview

- Initialise server
 - The main method in ChatServer class starts the server by creating a ServerSocket on the specified port (PORT).
 - It creates the ServerInputThread to handle server-side input concurrently.
 - Run method of ServerInputThread class (nested in ChatServer) continuously reads input from the server's console using System.in. and sends server messages to the connected client.
- Client Connection
 - The main method in ChatServer accepts a client connection using server.accept()
- Exchange Messages Between Server and Client
 - In the ChatHandler class, the sendMessage method writes a message to the client's output stream, which is then sent to the client, the main method reads user input and sends it to the server.
 - The serverListener Thread in ChatClient continuously listens for messages from the server and prints them to the client's console.



```
bin -- java --enable-preview -cp ../ChatApp.jar ie.atu.sw.Run...
anastasiia@MacBook-Pro bin % java --enable-preview -cp ../ChatApp.jar
ie.atu.sw.Runner server
Starting Chat Server...
Listening for connection on port 8080
Client connected from /127.0.0.1:65146
Message from /127.0.0.1: Hello from client!
Hello from server!
^

bin -- -zsh -- 71x24
anastasiia@MacBook-Pro bin % java --enable-preview -cp ../ChatApp.jar
ie.atu.sw.Runner client localhost
Starting Chat Client...
Connected to Chat Server on host localhost
Hello from client!
Received message from server: Server: Hello from server!
^q
anastasiia@MacBook-Pro bin %
```

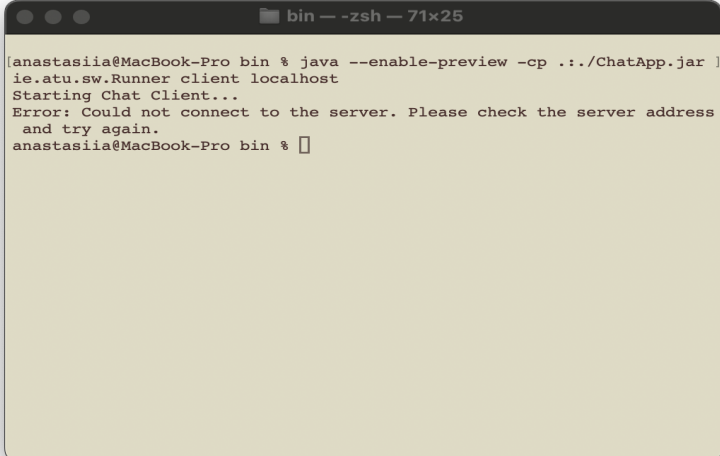
Considerations

1. In the ChatClient class, the server's hostname is obtained from the command-line arguments:

```
String hostname = args.length > 0 ? args[0] : "localhost";
```

So to connect to server on localhost command **java --enable-preview -cp ../ChatApp.jar ie.atu.sw.Runner client localhost** shall be used

2. In the ChatClient class, if the Socket constructor fails to establish a connection with the server, an IOException is caught, and the error message "Error: Could not connect to the server. Please check the server address and try again." is printed:



```
bin — zsh — 71x25
[anastasiia@MacBook-Pro bin % java --enable-preview -cp ../ChatApp.jar
ie.atu.sw.Runner client localhost
Starting Chat Client...
Error: Could not connect to the server. Please check the server address
and try again.
anastasiia@MacBook-Pro bin % ]
```