Chat Server Programming Assignment

Vinod Thorat

3/26/2018

Chat Application

Problem Statement

Chat Server Programming Assignment
==================================
Introduction

You have to write a program based on provided requirements. You are free to use a programming language of your choice, preferably Java. Please state all assumptions when implementing a solution. It is important to deliver elegant object-oriented code, apply design patterns and consider performance of the implementation. In addition, please provide JUnit test cases and comments for the implemented classes. Your delivered program should compile (provide all required jars) and run.

Chat Server

Develop a TCP/IP based multi-party chat server and client. Application should include appropriate unit test, error logging, and design documentation.

Server Requirements:
- Server should accept 1 to 10 simultaneous client connections
- A message received from any client should be echoed to all clients by default
- The server should log all client connect and disconnect events
- The listening IP and port address should be configurable

Client Requirements:
- The server IP and port address should be configurable
- The client should attempt to connect to the server and gracefully handle connection failures and disconnect events
- At start-up, the client should ask the user to provide a unique username
- The client should allow the user to enter an alpha-numeric text message
- Entered text messages should be transmitted to the server
- The client should display received text messages
- The client should be able to filter messages by user
- (Optional) The client should be able to send a message to a selected user

Chat Application

Solution

The solution for given assignment is in two phases.

1. Screenshots of all over application.
2. Source code for given application.
3. Junit testing.
4. Logging file.
5. Two applications data.

Source code

UI Code:

Client_frame.form

```xml
<?xml version="1.0" encoding="UTF-8" ?>

<Form version="1.5" maxVersion="1.8"
type="org.netbeans.modules.form.forminfo.JFrameFormInfo">
  <Properties>
    <Property name="defaultCloseOperation" type="int" value="3"/>
    <Property name="title" type="java.lang.String" value="Chat -
Client&apos;s frame"/>
    <Property name="name" type="java.lang.String" value="client"
noResource="true"/>
    <Property name="resizable" type="boolean" value="false"/>
  </Properties>
  <SyntheticProperties>
    <SyntheticProperty name="formSizePolicy" type="int" value="1"/>
    <SyntheticProperty name="generateCenter" type="boolean"
value="false"/>
  </SyntheticProperties>
  <AuxValues>
    <AuxValue name="FormSettings_autoResourcing"
type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_autoSetComponentName"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_generateFQN" type="java.lang.Boolean"
value="true"/>
    <AuxValue name="FormSettings_generateMnemonicsCode"
type="java.lang.Boolean" value="false"/>
```

```
    <AuxValue name="FormSettings_i18nAutoMode"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_layoutCodeTarget"
type="java.lang.Integer" value="1"/>
    <AuxValue name="FormSettings_listenerGenerationStyle"
type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_variablesLocal"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_variablesModifier"
type="java.lang.Integer" value="2"/>
  </AuxValues>

  <Layout>
    <DimensionLayout dim="0">
      <Group type="103" groupAlignment="0" attributes="0">
          <Group type="102" alignment="0" attributes="0">
              <EmptySpace max="-2" attributes="0"/>
              <Group type="103" groupAlignment="0" attributes="0">
                  <Group type="102" attributes="0">
                      <Component id="tf_chat" min="-2" pref="352"
max="-2" attributes="0"/>
                      <EmptySpace max="-2" attributes="0"/>
                      <Component id="b_send" pref="111" max="32767"
attributes="0"/>
                  </Group>
                  <Component id="jScrollPane1" max="32767"
attributes="0"/>
                  <Group type="102" attributes="0">
                      <Group type="103" groupAlignment="1" max="-2"
attributes="0">
                          <Component id="lb_username" pref="62"
max="32767" attributes="0"/>
                          <Component id="lb_address" max="32767"
attributes="0"/>
                           <Component id="cbox" max="32767"
attributes="0"/>
                      </Group>
                      <EmptySpace type="separate" max="-2"
attributes="0"/>
                      <Group type="103" groupAlignment="0" max="-2"
attributes="0">
                          <Component id="tf_address" pref="89"
max="32767" attributes="0"/>
```

```
                                        <Component id="tf_username" max="32767"
attributes="0"/>
                        </Group>
                        <EmptySpace type="separate" max="-2"
attributes="0"/>
                        <Group type="103" groupAlignment="0" max="-2"
attributes="0">
                                <Component id="lb_password" max="32767"
attributes="0"/>
                                <Component id="lb_port" max="32767"
attributes="0"/>
                        </Group>
                        <EmptySpace type="unrelated" max="-2"
attributes="0"/>
                        <Group type="103" groupAlignment="0" max="-2"
attributes="0">
                                <Component id="tf_password" max="32767"
attributes="0"/>
                                <Component id="tf_port" pref="50"
max="32767" attributes="0"/>
                        </Group>
                        <EmptySpace max="-2" attributes="0"/>
                        <Group type="103" groupAlignment="0"
attributes="0">
                                <Group type="102" attributes="0">
                                    <Component id="b_connect" min="-2"
max="-2" attributes="0"/>
                                    <EmptySpace min="-2" pref="2" max="-2"
attributes="0"/>
                                    <Component id="b_disconnect" min="-2"
max="-2" attributes="0"/>
                                    <EmptySpace min="0" pref="0" max="32767"
attributes="0"/>
                                </Group>
                                <Component id="b_anonymous" max="32767"
attributes="0"/>
                        </Group>
                    </Group>
                </Group>
                <EmptySpace max="-2" attributes="0"/>
            </Group>
            <Group type="102" alignment="1" attributes="0">
                <EmptySpace max="32767" attributes="0"/>
```

```
                <Component id="lb_name" min="-2" max="-2"
attributes="0"/>
                <EmptySpace min="-2" pref="201" max="-2"
attributes="0"/>
            </Group>
        </Group>
    </DimensionLayout>
    <DimensionLayout dim="1">
      <Group type="103" groupAlignment="0" attributes="0">
          <Group type="102" alignment="0" attributes="0">
              <EmptySpace max="-2" attributes="0"/>
              <Group type="103" groupAlignment="3" attributes="0">
                  <Component id="lb_address" alignment="3" min="-2"
max="-2" attributes="0"/>
                  <Component id="cbox" alignment="3" min="-2" max="-2"
attributes="0"/>
                  <Component id="tf_address" alignment="3" min="-2"
max="-2" attributes="0"/>
                  <Component id="lb_port" alignment="3" min="-2"
max="-2" attributes="0"/>
                  <Component id="tf_port" alignment="3" min="-2"
max="-2" attributes="0"/>
                  <Component id="b_anonymous" alignment="3" min="-2"
max="-2" attributes="0"/>
              </Group>
              <EmptySpace type="unrelated" max="-2" attributes="0"/>
              <Group type="103" groupAlignment="0" max="-2"
attributes="0">
                  <Component id="tf_username" alignment="0"
max="32767" attributes="0"/>
                  <Component id="tf_password" alignment="0"
max="32767" attributes="0"/>
                  <Group type="103" groupAlignment="3" attributes="0">
                      <Component id="lb_username" alignment="3" min="-
2" max="-2" attributes="0"/>
                      <Component id="lb_password" alignment="3" min="-
2" max="-2" attributes="0"/>
                      <Component id="b_connect" alignment="3" min="-2"
max="-2" attributes="0"/>
                      <Component id="b_disconnect" alignment="3"
min="-2" max="-2" attributes="0"/>
                  </Group>
              </Group>
              <EmptySpace type="unrelated" max="-2" attributes="0"/>
```

```
                <Component id="jScrollPane1" min="-2" pref="310" max="-
2" attributes="0"/>
                <EmptySpace type="unrelated" max="-2" attributes="0"/>
                <Group type="103" groupAlignment="0" attributes="0">
                    <Component id="tf_chat" max="32767" attributes="0"/>
                    <Component id="b_send" pref="31" max="32767"
attributes="0"/>
                </Group>
                <EmptySpace max="-2" attributes="0"/>
                <Component id="lb_name" min="-2" max="-2"
attributes="0"/>
            </Group>
        </Group>
    </DimensionLayout>
  </Layout>
  <SubComponents>
    <Component class="javax.swing.JLabel" name="cbox">
      <Properties>
        <Property name="text" type="java.lang.String" value="cbox :
"/>
      </Properties>
    <Component class="javax.swing.JComboBox" name="cbox1">
      <Properties>
        <Property name="text" type="java.lang.String" value="All"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent" handler="cboxPerformed"/>
      </Events>


    <Component class="javax.swing.JLabel" name="lb_address">
      <Properties>
        <Property name="text" type="java.lang.String" value="Address :
"/>
      </Properties>
    </Component>
    <Component class="javax.swing.JTextField" name="tf_address">
      <Properties>
        <Property name="text" type="java.lang.String"
value="localhost"/>
      </Properties>
      <Events>
```

```
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="tf_addressActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JLabel" name="lb_port">
      <Properties>
        <Property name="text" type="java.lang.String" value="Port :"/>
      </Properties>
    </Component>
    <Component class="javax.swing.JTextField" name="tf_port">
      <Properties>
        <Property name="text" type="java.lang.String" value="2222"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="tf_portActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JLabel" name="lb_username">
      <Properties>
        <Property name="text" type="java.lang.String" value="Username
:"/>
      </Properties>
    </Component>
    <Component class="javax.swing.JTextField" name="tf_username">
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="tf_usernameActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JLabel" name="lb_password">
      <Properties>
        <Property name="text" type="java.lang.String" value="Password
: "/>
      </Properties>
    </Component>
    <Component class="javax.swing.JTextField" name="tf_password">
    </Component>
```

```
    <Component class="javax.swing.JButton" name="b_connect">
      <Properties>
        <Property name="text" type="java.lang.String"
value="Connect"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_connectActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JButton" name="b_disconnect">
      <Properties>
        <Property name="text" type="java.lang.String"
value="Disconnect"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_disconnectActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JButton" name="b_anonymous">
      <Properties>
        <Property name="text" type="java.lang.String" value="Anonymous
Login"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_anonymousActionPerformed"/>
      </Events>
    </Component>
    <Container class="javax.swing.JScrollPane" name="jScrollPane1">
      <AuxValues>
        <AuxValue name="autoScrollPane" type="java.lang.Boolean"
value="true"/>
      </AuxValues>
```

```
        <Layout
class="org.netbeans.modules.form.compat2.layouts.support.JScrollPaneSu
pportLayout"/>
        <SubComponents>
          <Component class="javax.swing.JTextArea" name="ta_chat">
            <Properties>
              <Property name="columns" type="int" value="20"/>
              <Property name="rows" type="int" value="5"/>
            </Properties>
          </Component>
        </SubComponents>
      </Container>
      <Component class="javax.swing.JTextField" name="tf_chat">
      </Component>
      <Component class="javax.swing.JButton" name="b_send">
        <Properties>
          <Property name="text" type="java.lang.String" value="SEND"/>
        </Properties>
        <Events>
          <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_sendActionPerformed"/>
        </Events>
      </Component>
      <Component class="javax.swing.JLabel" name="lb_name">
        <Properties>
          <Property name="text" type="java.lang.String"
value="vthorat1"/>
          <Property name="border" type="javax.swing.border.Border"
editor="org.netbeans.modules.form.editors2.BorderEditor">
            <Border
info="org.netbeans.modules.form.compat2.border.LineBorderInfo">
              <LineBorder/>
            </Border>
          </Property>
        </Properties>
      </Component>
    </SubComponents>
</Form>
```

Server_frame.form

```xml
<?xml version="1.0" encoding="UTF-8" ?>

<Form version="1.3" maxVersion="1.8"
type="org.netbeans.modules.form.forminfo.JFrameFormInfo">
  <Properties>
    <Property name="defaultCloseOperation" type="int" value="3"/>
    <Property name="title" type="java.lang.String" value="Chat -
Server&apos;s frame"/>
    <Property name="name" type="java.lang.String" value="server"
noResource="true"/>
    <Property name="resizable" type="boolean" value="false"/>
  </Properties>
  <SyntheticProperties>
    <SyntheticProperty name="formSizePolicy" type="int" value="1"/>
    <SyntheticProperty name="generateCenter" type="boolean"
value="false"/>
  </SyntheticProperties>
  <AuxValues>
    <AuxValue name="FormSettings_autoResourcing"
type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_autoSetComponentName"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_generateFQN" type="java.lang.Boolean"
value="true"/>
    <AuxValue name="FormSettings_generateMnemonicsCode"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_i18nAutoMode"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_layoutCodeTarget"
type="java.lang.Integer" value="1"/>
    <AuxValue name="FormSettings_listenerGenerationStyle"
type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_variablesLocal"
type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_variablesModifier"
type="java.lang.Integer" value="2"/>
  </AuxValues>

  <Layout>
    <DimensionLayout dim="0">
```

```
<Group type="103" groupAlignment="0" attributes="0">
    <Group type="102" attributes="0">
        <EmptySpace max="-2" attributes="0"/>
        <Group type="103" groupAlignment="0" attributes="0">
            <Component id="jScrollPane1" max="32767" attributes="0"/>
            <Group type="102" attributes="0">
                <Group type="103" groupAlignment="0" max="-2" attributes="0">
                    <Component id="b_end" max="32767" attributes="0"/>
                    <Component id="b_start" pref="75" max="32767" attributes="0"/>
                </Group>
                <EmptySpace type="separate" max="-2" attributes="0"/>
                <Group type="103" groupAlignment="0" max="-2" attributes="0">
                    <Component id="lb_password" max="32767" attributes="0"/>
                    <Component id="lb_port" max="32767" attributes="0"/>
                </Group>
                <EmptySpace type="unrelated" max="-2" attributes="0"/>
                <Group type="103" groupAlignment="0" max="-2" attributes="0">
                    <Component id="tf_password" max="32767" attributes="0"/>
                    <Component id="tf_port" pref="50" max="32767" attributes="0"/>
                </Group>

                <EmptySpace pref="291" max="32767" attributes="0"/>
                <Group type="103" groupAlignment="0" max="-2" attributes="0">
                    <Component id="b_clear" max="32767" attributes="0"/>
                    <Component id="b_users" pref="103" max="32767" attributes="0"/>
                </Group>
            </Group>
        </Group>
    </Group>
```

```
                    <EmptySpace max="-2" attributes="0"/>
                </Group>
                <Group type="102" alignment="1" attributes="0">
                    <EmptySpace max="32767" attributes="0"/>
                    <Component id="lb_name" min="-2" max="-2"
attributes="0"/>
                    <EmptySpace min="-2" pref="209" max="-2"
attributes="0"/>
                </Group>
            </Group>
        </DimensionLayout>
        <DimensionLayout dim="1">
          <Group type="103" groupAlignment="0" attributes="0">
              <Group type="102" alignment="0" attributes="0">
                  <EmptySpace max="-2" attributes="0"/>
                  <Component id="jScrollPane1" pref="340" max="32767"
attributes="0"/>
                  <EmptySpace type="separate" max="-2" attributes="0"/>
                  <Group type="103" groupAlignment="3" attributes="0">
                      <Component id="b_start" alignment="3" min="-2"
max="-2" attributes="0"/>
                      <Component id="b_users" alignment="3" min="-2"
max="-2" attributes="0"/>
                      <Component id="lb_port" alignment="3" min="-2"
max="-2" attributes="0"/>
                      <Component id="tf_port" alignment="3" min="-2"
max="-2" attributes="0"/>

                  </Group>
                  <EmptySpace type="separate" max="-2" attributes="0"/>
                  <Group type="103" groupAlignment="3" attributes="0">
                      <Component id="b_clear" alignment="3" min="-2"
max="-2" attributes="0"/>
                      <Component id="b_end" alignment="3" min="-2" max="-
2" attributes="0"/>
                  </Group>
                  <EmptySpace min="-2" pref="4" max="-2" attributes="0"/>
                  <Component id="lb_name" min="-2" max="-2"
attributes="0"/>
              </Group>
          </Group>
        </DimensionLayout>
      </Layout>
      <SubComponents>
```

```
    <Container class="javax.swing.JScrollPane" name="jScrollPane1">
      <AuxValues>
        <AuxValue name="autoScrollPane" type="java.lang.Boolean"
value="true"/>
      </AuxValues>

      <Layout
class="org.netbeans.modules.form.compat2.layouts.support.JScrollPaneSu
pportLayout"/>
      <SubComponents>
        <Component class="javax.swing.JTextArea" name="ta_chat">
          <Properties>
            <Property name="columns" type="int" value="20"/>
            <Property name="rows" type="int" value="5"/>
          </Properties>
        </Component>
      </SubComponents>
    </Container>
    <Component class="javax.swing.JButton" name="b_start">
      <Properties>
        <Property name="text" type="java.lang.String" value="START"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_startActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JButton" name="b_end">
      <Properties>
        <Property name="text" type="java.lang.String" value="END"/>
      </Properties>
      <Events>
        <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_endActionPerformed"/>
      </Events>
    </Component>
    <Component class="javax.swing.JButton" name="b_users">
      <Properties>
        <Property name="text" type="java.lang.String" value="Online
Users"/>
```

```
        </Properties>
        <Events>
          <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_usersActionPerformed"/>
        </Events>
      </Component>
      <Component class="javax.swing.JButton" name="b_clear">
        <Properties>
          <Property name="text" type="java.lang.String" value="Clear"/>
        </Properties>
        <Events>
          <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="b_clearActionPerformed"/>
        </Events>
      </Component>

      <Component class="javax.swing.JLabel" name="lb_port">
        <Properties>
          <Property name="text" type="java.lang.String" value="Port :"/>
        </Properties>
      </Component>
      <Component class="javax.swing.JTextField" name="tf_port">
        <Properties>
          <Property name="text" type="java.lang.String" value="2222"/>
        </Properties>
        <Events>
          <EventHandler event="actionPerformed"
listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent"
handler="tf_portActionPerformed"/>
        </Events>
      </Component>


      <Component class="javax.swing.JLabel" name="lb_name">
        <Properties>
          <Property name="text" type="java.lang.String"
value="vthorat1"/>
```

```
        <Property name="border" type="javax.swing.border.Border"
editor="org.netbeans.modules.form.editors2.BorderEditor">
          <Border
info="org.netbeans.modules.form.compat2.border.LineBorderInfo">
            <LineBorder/>
          </Border>
        </Property>
      </Properties>
    </Component>
  </SubComponents>
</Form>
```

This is UI code for client and server, uploaded at GitHub account @vinodthorat121
Under ChatServerApplication.

Thank you,
Vinod Thorat