**Project 01**

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**Link:** <https://github.com/hvluu/CS380/tree/master/Project1>

**Source code**

**ChatClient.java**

*import javafx.application.Application;*

*import javafx.application.Platform;*

*import javafx.fxml.FXMLLoader;*

*import javafx.scene.Scene;*

*import javafx.stage.Stage;*

*import java.io.\*;*

*import java.net.Socket;*

*import java.net.UnknownHostException;*

*public class ChatClient extends Application*

*{*

*private static Socket socket;*

*public static Controller controller;*

*public static Scene chatScreen;*

*public static Scene loginScreen;*

*public static Stage stage;*

*/\**

*\* Override the start() method that's in the Application class*

*\* @param primaryStage*

*\* @throws Exception*

*\*/*

*@Override*

*public void start(Stage mainStage) throws Exception*

*{*

*// Login screen.*

*FXMLLoader loader = new FXMLLoader(getClass().getResource("LoginLayout.fxml"));*

*loginScreen = new Scene(loader.load(), 500, 500);*

*// Chat screen.*

*loader = new FXMLLoader(getClass().getResource("ChatLayout.fxml"));*

*chatScreen = new Scene(loader.load(), 1280, 720);*

*// Saves a reference of the Controller object so*

*// the Listener thread can access it.*

*controller = loader.getController();*

*// Saves a reference of the Stage object so*

*// the Controller class can access it.*

*// It also sets the stage.*

*stage = mainStage;*

*stage.setTitle("Chat Client");*

*stage.setResizable(false);*

*stage.setScene(loginScreen);*

*stage.show();*

*}*

*public static void main(String[] args)*

*{*

*launch(args);*

*ListenerThread.endThread = true;*

*}*

*/\*\**

*\* Function to send a message to the server.*

*\*/*

*public static void send(String m)*

*{*

*try*

*{*

*OutputStream outputStream = socket.getOutputStream();*

*PrintStream out = new PrintStream(outputStream, false, "UTF-8");*

*out.println(m);*

*}*

*catch (Exception e)*

*{*

*System.err.println(e.getMessage());*

*// Updates the statusLabel GUI object with the*

*// error message.*

*Platform.runLater(() ->*

*controller.setStatus(e.getMessage()));*

*}*

*}*

*/\*\**

*\* Function that connects the client to the server and*

*\* creates a Listener thread.*

*\*/*

*public static void connect()*

*{*

*String hostName = "18.221.102.182";*

*int portNumber = 38001;*

*try*

*{*

*socket = new Socket(hostName, portNumber);*

*ListenerThread.endThread = false;*

*// Creates and starts a new thread to listen for messages.*

*new ListenerThread(socket).start();*

*}*

*catch (UnknownHostException e)*

*{*

*System.err.println("ERROR: Unknown host " + hostName + ".");*

*}*

*catch (Exception e)*

*{*

*System.err.println("ERROR: Could not connect to " + hostName + ".");*

*}*

*}*

*/\*\**

*\* Function to disconnect the client from the server.*

*\*/*

*public static void disconnect()*

*{*

*try*

*{*

*socket.close();*

*}*

*catch (IOException e)*

*{*

*System.err.println(e.getMessage());*

*}*

*}*

*}*

**ListenerThread.java**

*import javafx.application.Platform;*

*import java.io.\*;*

*import java.net.Socket;*

*public class ListenerThread extends Thread*

*{*

*public volatile static boolean endThread = false;*

*private Socket socket = null;*

*public ListenerThread(Socket socket)*

*{*

*super("Chat Listener Thread");*

*this.socket = socket;*

*}*

*/\*\**

*\* Override the run() function that's in the Thread class.*

*\* This overriden function handles the communication between client and server*

*\*/*

*public void run()*

*{*

*try*

*{*

*// Objects needed for receiving and reading the server's messages.*

*String rMessage;*

*InputStream inputStream = socket.getInputStream();*

*InputStreamReader inputStreamReader = new InputStreamReader(inputStream, "UTF-8");*

*BufferedReader in = new BufferedReader(inputStreamReader);*

*// The main loop of execution.*

*// This executes when the servers sends a message*

*// and the thread has not received a flag to terminate.*

*while((rMessage = in.readLine()) != null*

*&& !endThread)*

*{*

*// NOTE: The variable sent to the*

*// Application GUI thread has to be final.*

*final String message = rMessage;*

*// Displays the received messages.*

*Platform.runLater(() ->*

*ChatClient.controller.setMessages(message));*

*// Catches the Unavailable Username error.*

*if(message.equals("Name is taken."))*

*{*

*Platform.runLater(() ->*

*ChatClient.controller.displayError("Unavailable username",*

*"The username you entered is already taken."));*

*endThread = true;*

*}*

*// Catches the Inactivity error.*

*if(message.equals("Connection idles for 1 minute, closing connection."))*

*{*

*Thread.sleep(5000);*

*Platform.runLater(() ->*

*ChatClient.controller.displayError("Connection Timed Out",*

*"You were idle for 1 minute, "*

*+ "your connection is now closed."));*

*endThread = true;*

*}*

*}*

*ChatClient.disconnect();*

*}*

*catch (IOException e)*

*{*

*System.err.println("ERROR: Connection to the server is lost.");*

*}*

*catch (InterruptedException e)*

*{*

*System.err.println(e.getMessage());*

*}*

*}*

*}*

**Controller.java**

*import javafx.collections.FXCollections;*

*import javafx.collections.ObservableList;*

*import javafx.fxml.FXML;*

*import javafx.scene.control.\*;*

*public class Controller*

*{*

*@FXML private TextField messageTextField;*

*@FXML private ListView<String> chatWindowListView;*

*@FXML private Label statusLabel;*

*@FXML private TextField usernameTextField;*

*private ObservableList<String> messages = FXCollections.observableArrayList();*

*/\*\**

*\* Switching between the Login and Chat windows.*

*\*/*

*public void switchWindows()*

*{*

*if(ChatClient.stage.getScene().equals(ChatClient.loginScreen))*

*{*

*ChatClient.stage.setScene(ChatClient.chatScreen);*

*ChatClient.stage.setResizable(true);*

*}*

*else*

*{*

*ChatClient.stage.setScene(ChatClient.loginScreen);*

*ChatClient.stage.setResizable(false);*

*}*

*ChatClient.stage.centerOnScreen();*

*}*

*/\*\**

*\* Logging in function*

*\*/*

*public void login()*

*{*

*ChatClient.connect();*

*ChatClient.send(usernameTextField.getText());*

*switchWindows();*

*}*

*/\*\**

*\* Logging out function.*

*\* After logging out, the thread is also killed*

*\*/*

*public void logout()*

*{*

*switchWindows();*

*messages.clear();*

*ListenerThread.endThread = true;*

*ChatClient.disconnect();*

*}*

*public void displayError(String title, String message)*

*{*

*logout();*

*Alert alert = new Alert(Alert.AlertType.ERROR);*

*alert.setTitle(title);*

*alert.setHeaderText(title);*

*alert.setContentText(message);*

*alert.showAndWait();*

*}*

*/\*\**

*\* Sends a message to the server when the user*

*\* either clicks on the Send button or presses*

*\* the Enter key while the Message TextField is focused.*

*\*/*

*public void send()*

*{*

*String message = messageTextField.getText();*

*// Trimming the message and checking if the*

*// String is not empty after trimming it*

*// prevents blank messages from being sent.*

*if(!message.trim().isEmpty())*

*{*

*ChatClient.send(message);*

*messageTextField.clear();*

*}*

*}*

*/\*\**

*\* Displays the messages received from the server.*

*\* @param message - The last received message.*

*\*/*

*public void setMessages(String message)*

*{*

*messages.add(message);*

*chatWindowListView.setItems(messages);*

*}*

*/\*\**

*\* Displays the status messages located in the status bar.*

*\* @param status - The status message.*

*\*/*

*public void status(String status)*

*{*

*statusLabel.setText("Status: " + status + ".");*

*}*

*}*

**LoginLayout.fxml**

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

*<?import javafx.scene.control.Button?>*

*<?import javafx.scene.control.Label?>*

*<?import javafx.scene.control.TextField?>*

*<?import javafx.scene.layout.BorderPane?>*

*<?import javafx.scene.layout.ColumnConstraints?>*

*<?import javafx.scene.layout.GridPane?>*

*<?import javafx.scene.layout.Pane?>*

*<?import javafx.scene.layout.RowConstraints?>*

*<BorderPane fx:id="borderPaneMain" maxHeight="-Infinity" maxWidth="-Infinity" minHeight="-Infinity" minWidth="-Infinity" prefHeight="500.0" prefWidth="500.0" styleClass="background" stylesheets="Theme.css" xmlns="http://javafx.com/javafx/8.0.111" xmlns:fx="http://javafx.com/fxml/1" fx:controller="Controller">*

*<center>*

*<GridPane prefHeight="579.0" prefWidth="500.0">*

*<columnConstraints>*

*<ColumnConstraints hgrow="SOMETIMES" maxWidth="1233.0" minWidth="10.0" percentWidth="100.0" prefWidth="1100.0" />*

*</columnConstraints>*

*<rowConstraints>*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="48.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="2.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="10.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="10.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="0.0" percentHeight="15.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="10.0" prefHeight="89" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="10.0" prefHeight="89." vgrow="SOMETIMES" />*

*</rowConstraints>*

*<children>*

*<GridPane alignment="CENTER" GridPane.rowIndex="4">*

*<columnConstraints>*

*<ColumnConstraints halignment="CENTER" hgrow="ALWAYS" maxWidth="797" minWidth="10.0" percentWidth="60.0" prefWidth="730.0" />*

*</columnConstraints>*

*<rowConstraints>*

*<RowConstraints minHeight="10.0" prefHeight="30.0" vgrow="SOMETIMES" />*

*</rowConstraints>*

*<children>*

*<TextField fx:id="usernameTextField" alignment="CENTER" onAction="#login" prefHeight="37.0" prefWidth="278.0" GridPane.halignment="CENTER" GridPane.valignment="CENTER" />*

*</children>*

*</GridPane>*

*<Button fx:id="loginButton" mnemonicParsing="false" onAction="#login" style="-fx-font-size: 18;" text="Login" GridPane.halignment="CENTER" GridPane.rowIndex="5" GridPane.valignment="CENTER" />*

*<Label style="-fx-font-size: 22;" text="Username" GridPane.halignment="CENTER" GridPane.rowIndex="3" GridPane.valignment="BOTTOM" />*

*<GridPane style="-fx-background-color: black;">*

*<columnConstraints>*

*<ColumnConstraints hgrow="SOMETIMES" minWidth="10.0" prefWidth="100.0" />*

*</columnConstraints>*

*<rowConstraints>*

*<RowConstraints minHeight="10.0" prefHeight="30.0" vgrow="SOMETIMES" />*

*</rowConstraints>*

*<children>*

*<Label id="titleLabel" alignment="CENTER" prefHeight="151.0" prefWidth="309.0" style="-fx-font-size: 45;" stylesheets="Theme.css" text="Chat Client" textAlignment="CENTER" wrapText="true" GridPane.halignment="CENTER" GridPane.valignment="CENTER" />*

*</children>*

*</GridPane>*

*<Pane prefHeight="200.0" prefWidth="200.0" style="-fx-background-color: white;" GridPane.rowIndex="1" />*

*</children>*

*</GridPane>*

*</center>*

*</BorderPane>*

**ChatLayout.fxml**

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

*<?import javafx.geometry.Insets?>*

*<?import javafx.scene.control.Button?>*

*<?import javafx.scene.control.Label?>*

*<?import javafx.scene.control.ListView?>*

*<?import javafx.scene.control.TextField?>*

*<?import javafx.scene.layout.BorderPane?>*

*<?import javafx.scene.layout.ColumnConstraints?>*

*<?import javafx.scene.layout.GridPane?>*

*<?import javafx.scene.layout.HBox?>*

*<?import javafx.scene.layout.Pane?>*

*<?import javafx.scene.layout.RowConstraints?>*

*<BorderPane fx:id="borderPaneMain" maxHeight="-Infinity" maxWidth="-Infinity" prefHeight="720.0" prefWidth="1280.0" styleClass="background" stylesheets="Theme.css" xmlns="http://javafx.com/javafx/8.0.111" xmlns:fx="http://javafx.com/fxml/1" fx:controller="Controller">*

*<bottom>*

*<HBox alignment="CENTER\_LEFT" style="-fx-background-color: black;" BorderPane.alignment="CENTER">*

*<Label fx:id="statusLabel" text="Status:">*

*<padding>*

*<Insets bottom="5.0" left="5.0" right="5.0" top="5.0" />*

*</padding>*

*</Label>*

*</HBox>*

*</bottom>*

*<center>*

*<GridPane>*

*<columnConstraints>*

*<ColumnConstraints hgrow="SOMETIMES" maxWidth="1233.0" minWidth="10.0" percentWidth="100.0" prefWidth="1100.0" />*

*</columnConstraints>*

*<rowConstraints>*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="80.0" prefHeight="90" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="10.0" percentHeight="2.0" prefHeight="90" vgrow="SOMETIMES" />*

*<RowConstraints maxHeight="320" minHeight="0.0" percentHeight="20.0" prefHeight="90" vgrow="SOMETIMES" />*

*</rowConstraints>*

*<GridPane alignment="CENTER" GridPane.rowIndex="2">*

*<columnConstraints>*

*<ColumnConstraints halignment="CENTER" hgrow="ALWAYS" maxWidth="800" minWidth="10.0" percentWidth="5.0" prefWidth="730.0" />*

*<ColumnConstraints halignment="CENTER" hgrow="ALWAYS" maxWidth="800" minWidth="10.0" percentWidth="90.0" prefWidth="730.0" />*

*<ColumnConstraints halignment="CENTER" hgrow="ALWAYS" maxWidth="901" minWidth="10.0" percentWidth="15.0" prefWidth="192.0" />*

*</columnConstraints>*

*<rowConstraints>*

*<RowConstraints minHeight="10.0" prefHeight="30.0" vgrow="SOMETIMES" />*

*</rowConstraints>*

*<TextField fx:id="messageTextField" onAction="#sendMessage" promptText="Enter your message here..." GridPane.columnIndex="1" GridPane.halignment="CENTER" GridPane.valignment="CENTER" />*

*<Button fx:id="sendButton" mnemonicParsing="false" onAction="#sendMessage" text="Send" GridPane.columnIndex="2" GridPane.halignment="CENTER" GridPane.valignment="CENTER" />*

*</GridPane>*

*<ListView fx:id="chatWindowListView" editable="true" prefHeight="200.0" prefWidth="200.0" style="-fx-background-color: #3f3f3f;" />*

*<Pane prefHeight="200.0" prefWidth="200.0" style="-fx-background-color: black;" GridPane.rowIndex="1" />*

*</GridPane>*

*</center>*

*<top>*

*<Label onMouseClicked="#logout" style="-fx-font-size: 20;" text="Logout" textAlignment="CENTER" BorderPane.alignment="CENTER\_RIGHT">*

*<padding>*

*<Insets right="20.0" />*

*</padding>*

*</Label>*

*</top>*

*</BorderPane>*

**Theme.css**

*.background {*

*-fx-background-color: gray;*

*}*

*.label {*

*-fx-font-size: 12pt;*

*-fx-font-family: "Arial Hebrew";*

*-fx-text-fill: black;*

*-fx-opacity: 1;*

*}*

*.label-bright {*

*-fx-font-size: 11pt;*

*-fx-font-family: "Arial Hebrew Light";*

*-fx-text-fill: black;*

*-fx-opacity: 1;*

*}*

*.label-header {*

*-fx-font-size: 32pt;*

*-fx-font-family: "Arial Hebrew Bold";*

*-fx-text-fill: black;*

*-fx-opacity: 1;*

*}*

*.table-view {*

*-fx-base: #1d1d1d;*

*-fx-control-inner-background: #1d1d1d;*

*-fx-background-color: #1d1d1d;*

*-fx-table-cell-border-color: transparent;*

*-fx-table-header-border-color: transparent;*

*-fx-padding: 5;*

*}*

*.table-view .column-header-background {*

*-fx-background-color: transparent;*

*}*