* + An explanation of your understanding any distributed system concepts that you have apply in your assignment.
  + A description of how you applied the distributed concepts in your assignment.
  + The problems encountered during this assignment and how you solved these problems.
  + An evaluation of the strengths and weaknesses of your submitted work.
  + Include each group’s member contribution percentage.

Distributed System concepts and implementation

As we always defined, distributed system is one in which components located at networked computers communicate and coordinate their actions only by passing messages. We have built a distributed chat system with such definition. The entire system is implemented through messages passing and without the uses of shared memory. As this system is distributed, each node will keep their own set of data rather than centralized set of data.

Problem Encounter

One of the major challenges in creating the Graphical User Interface (GUI) is that the limited resources available online for scalafx. It is because the limited documentation for scalafx and limited number of blogs, forums and extra documentations. Hence, we are trying to search for javafx instead of scalafx because since scalafx is just wrapper for javafx and we are able to write scalafx according to javafx resources.

We also meet a problem in customizing the list cell of the list view of the chatroom. Since it is a chatroom, we hope to create an interface that is familiar to the user like all other chatrooms. When we are trying to achieve this, we ran into a problem which is the limited customization of default list cell. Therefore, we implemented our own custom list cell with custom font size, font family, padding, background colour, alignment, background radius, minimum width, and maximum width.

After we customized the list cell for chatroom, we found that changing the cell alignment to left and right is still insufficient for group chat because the sender is unable to be identified only through changing the cell alignment to left and right. Thus, we created another type of list cell that can show the sender of the message and use it in group chat.

Rather than sending single line messages, we are trying to send both single line and multi-line of messages. Meanwhile, we are trying to keep the "enter to send behaviour" for our text area. Therefore, we had customized the text area where it will add a newline while the key combination of shift and enter is pressed, and send the messages when enter is pressed.

Also, we also encountered a problem when we are trying to make the entire sy to be responsive because the components will be misaligned and shrink into inappropriate size. Therefore, we are making great efforts in modifying the layout settings and properties of every component to ensure responsiveness of the interfaces.

We think that user interface and user experiences are playing important roles in determining the successfulness of the entire system. As first, we have already designed the interfaces with the most basic layout and components. However, we decided to redesign and implement the entire system with a better design. We have even design the interface with the properties and layout of each components before the actual implementation of the interfaces. As we decided to majorly change the interfaces, we faced another challenge because every controller of the interface needed to be rewritten.

When we are nearly done with our system, we found one minor issue where the user cannot know when other people message him or her. Therefore, we implemented an unread function where the user can see the message that he or she received but have not read yet. Initially when implementing this function, we done it through refreshing the cells every time a user received a message and display it on the particular cell. However, we found it is very inefficient to refreshing the cells every time and practically a bad practice. Therefore, we decided add listener to every cell and they will always listen to the changes of the items they are displaying.

Strengths

Weaknesses