COMP3015 Data Communications and Networking Project 2022-23

Problem

A company wants to have a user-friendly WhatsApp/WeChat-like instant messaging app for internal quick message exchange and file sharing. For security reason, this company wants to have their own messaging system instead of using the 3th party system.

Requirements (max. 70 marks)

You need to form a **3-member group** and develop a system that meets the company's needs.

Important note:
Additional memberships are not accepted. Ungrouped students will be randomly assigned, or they may be required to complete projects individually.

Here are the project requirements:

1. You need to use JAVA SE 1.8 to complete the development.
2. The system operates in a client-server mode. It has two parts:
    a. Client program: It is a desktop application that provides message input and display, file upload and download, etc. It works like WhatsApp and WeChat message section.
    b. Server program: It handles user login, message exchange and file transmission.
3. The client program is a GUI desktop app.
4. The client program requires the user login to operate. User account information is stored in the server program.
5. The client program allows the user to create/open a chat room if the user wants to send an message to another. For example:
    a. Alice wants to send a message to Bob. She needs to create a chat room by selecting/entering Bob's name/ID. Then she can send a message to Bob. Bob's replies also appear in the chat room.
    b. If there is a chat room with Bob's talking, no new chat room will be created. An existing chat room will open.

6. The client program provides a list of chat rooms. When a user clicks on one of the chat rooms, he/she can view the conversation with a specific person.

7. When the user sends a message, the message is delivered from the sender's client program to the server program. It will then be transmitted to the receiver's client program.

8. If the receiver is offline, the message will be stored on the server side until the receiver is online. If the receiver comes back online, the stored messages will be downloaded to the receiver's client program. The messages stored on the server program will then be deleted.

9. Users can send files.

    a. If the receiver is offline, the files will be stored on the server side.

    b. If the receiver is online, image files will be transferred immediately, and the delivered images will be displayed immediately.

    c. Other files are not transferred immediately even if the receiver is online. Instead, the files will be stored on the server side, and specific indicators (e.g., labels with text) will be displayed on the receiver's client program. The receiver clicks the indicator to download the file.

10. The client program allows the sender to create a chat room with multiple receivers (group chat room).

Additional Features (max. 20 marks)

You need to add additional features. The marks are dependent on the difficulty level, functionalities, and completion of the additional features. You should show your implemented features clearly in the report and the demonstration.

For example: If you plan to implement data encryption and decryption, you need to make sure you can demonstrate how it works. You might consider adding buttons to enable and disable encryption and decryption to make it easier to demonstrate functionality.

Project Report and Demonstration Video (max. 10 marks)

Project Report:
The report should contain the following information:

1. A list of group members with full name, student ID, and a group leader indicator.

2. The procedures to run the server program and client program in **command-line**.

3. One to two paragraphs of the description for each workable feature. The description should also include the launching steps, such as click the menu "File" → "Share…" → select a file → click "Share".

4. A group member contribution table including the member names, job descriptions, percentages of the overall project, and member signatures.

Demonstration Video:
Each group is required to submit a program demonstration video. The video must meet the followings:

1. At the beginning of the video, each group member needs to show his/her face and state his/her full name clearly.

2. After that, members need to show the program screens and demonstrate how to run the programs in command-line – server program and client program.

3. Then, through a clear narrative, demonstrate how to use each workable feature. Each member should contribute to the demonstration.

4. In order to demonstrate network connection and data transfer, you should use multiple computers for the presentation. It is strongly recommended that you use lab computers.

5. You must ensure your video file can be played on Windows or Mac without installing a special software package. The suggested video formats are MP4, MOV, and WMV.

Submission

The group leader should submit the following files to BUMoodle on behalf of the group **by 11:00pm on November 25, 2022**.

Files:

- Source code files – your group only needs to submit the .java files, not the project folder of the IDE you used for the development.

- Report – the report file should be in normal PDF format.

- Video – the video file size must be less than 250 MB. And the video file needs to be submitted to BUMoodle. Download link or streaming link will not be accepted. You are recommended to use ZOOM recording to create the video.