Project 2: Design and Implementation of a Chat System

The main objective of this project is to design and implement a collaborative chat system for textual conversation between multiple participants communicating with each other. Participants must register to a server before they can send any messages to the current users. Your design and implementation should meet the following requirements.

- Each user will have a username and a password.
- Users can create and join a chat-room in the server.
- A user should be able to send messages to all users or a selected set of one or more users in the same chat-room.
- There can be more than one virtual chat-room within the server. However, a user can be in a single chat room at a time.
- Plain text messages spanning one or more lines can be sent.
- The server should provide a list of current users and current chat-rooms.
- The system should be reasonably scalable (as the number of users grows) and its response time should be low; this can be shown statistically, as well as with an argument based on the techniques you use.
- All messages should appear in the same order for all the clients.

Platform

- **Server:** Your choice
- **Client:** Android application

**Deliverables**

- **Implementation**
  - The complete code of the server and the client must be submitted with an appropriate documentation electronically.
  - Electronic submissions must be accompanied by a README file containing student names and instructions for running the system.

- **Report**
  - System design and the description of each of the components.
  - Description of the **design choices** you made in implementing each of the above requirements.
  - Description of the communication protocol.
  - Arguments regarding the security, scalability, portability, and reliability of the system. How secure is the chat system? What measures should, or have been, taken to address such issues?
  - Assumptions and project experience discussions.
  - Group member responsibilities – who did what?

**Marking Scheme (30)**

- Program Demonstration 20
- Project Report 10