Project P1: Internet Chat System

On this project, you will work in pairs. You are asked to develop an Internet chat system, based on a client/server architecture, using the Java language, and exploiting the TCP protocol:

- Your system should allow one to connect multiple remote clients to a single central server.

- When a user enters a text message on his/her client, the message is delivered through the server and displayed by any other client that is currently connected to the server, including the original sending client.

- Users can join and leave the chat at any time, provided the server is up.

- When joining, users choose nicknames, which will appear along with their individual messages. The server address must also be specified when running the client.

Features

The implementation should avoid unnecessary details and preferably be realized under Linux. For simplicity, the client can run in a single text-mode window. Nonetheless, some implementation features are required:

- When the user is typing, incoming messages must be buffered in order to avoid any overlap. They will be displayed later, once the user has entered his/her message.

- The overall system must be robust with respect to client crashes and/or blocked connections, i.e., any problem with a single client must not affect the other users.

Tasks

You are asked to:

- Write software engineering requirements for the system, including any necessary diagram.

- Describe your algorithm design, showing what interactions occur between the clients and the server.

- Develop a TCP-based Java implementation of both client and server. The Java code should be

    - robust (proper treatment of exceptions and odd cases),
    - well written (clear structure, meaningful identifier names, etc.),
    - properly commented (general structure, purpose of your classes and methods, concurrency of possible threads).

- Test your implementation and report on possible bugs and/or unexpected behaviors you should find.

- Shortly discuss a possible alternative implementation exploiting the UDP protocol, making a critical comparison between the two.

Deliverables and Deadline

Your deliverables will consist of

1. a 4–5 pages technical report in PDF format with the authors names, the complete code, included as an extra appendix to the above document,

2. instructions for running the system,

3. your working and tested Java implementation, including source files and instructions for running it.

Please, submit your work by email to `nutt` AT `inf.unibz.it` no later than

1 December 2009, 4pm.