Galway-Mayo Institute of Technology

Higher Diploma in Science (Software Development)

Network Programming Project

Your task is to demonstrate your understanding of networking by designing and implementing a network-based chat application in Java, using the Java Socket API.

Chat Application Functionality:

- Server starts up and waits for socket connections on a specific port.
- Client starts up and attempts to create a socket connection to the server.
- If a connection is successfully formed, then the client and server should be able to facilitate a text-based chat session between users at the client and server side, i.e.
    - Client and server should allow the user to enter text at the console (command line).
    - Messages entered by the user should be sent across the socket connection to the other application and displayed at the console.
- Users should be able to gracefully end the chat session and close the connection by entering "\q".

Minimum Requirements:

- The client program – *ChatClient* – that implements the client side functionality.
- The Server program – *ChatServer* – that facilitates the server-side functionality.
- A brief (1-2 page max.) design document that outlines the design / rationale for your programs, and references to any external sources consulted.

Additional Credit:

- High-scoring submissions will be robust and flexible, and will typically address issues like the following:
    - How does the client know what address to find the server on?
        - i.e. is the IP address and port hardcoded in the code, provided as a command line parameter, stored in a configuration file?
    - What happens if the client can't reach the server when it starts up?

- What happens if the client and server connect initially but the connection is lost during the chat session?

- To achieve a very high score submissions should include additional advanced functionality, for example using Threads to support multi-user chat sessions, where the server allows multiple clients to create socket connections, and messages sent by one user are sent out to all connected clients.

Notes:

- The exact design and implementation details are left to yourself to decide on.
- **All work submitted must be your own**. Where additional resources have been consulted, these should be clearly referenced. Submitting work under your name which was not done by you is a violation of GMITs Student Code of Conduct.

Marking Scheme:

- Marking of the project will follow the marking scheme below. See the end of this document for guidelines on grade from GMIT's Academic Code of Practice

Item	Marks
Design Doc	15
Functionality	25
Client	25
Server	25
Code Quality	10

Submission:

- The due date is **Sunday January 9th 2022 at 23:00.**
- Upload a single zip file to the assignment submission link on https://learnonline.gmit.ie/ containing:
  - Source code
  - Design document, which should include
    - Brief description of project design/implementation
    - Instructions for running the application
    - References to sources consulted

GRADE	DESCRIPTION
70 - 100%	Achievement indicates that required for a Pass and in most respects is significantly and consistently beyond this
60 - 69%	Achievement indicates that required for a Pass and in many respects is significantly beyond this
50 - 59%	Achievement indicates that required for a Pass and in some respects is significantly beyond this
40 - 49%	Attains all the minimum intended programme learning outcomes
35 - 39%	Has not attained all the minimum intended programme learning outcomes. May be eligible for compensation.
0 - 34%	Has not attained all the minimum intended programme learning outcomes.

Extract from Academic Code of Practice No.3: Student Assessment: Marks & Standards