CS5/7319- Software Architecture and Design
GHomework #1
(4 Points)

On Campus Due Date: 11:59pm on March 11, 2024
Off Campus Due Date: 11:59pm on March 12, 2024

Note: This homework is only required for Graduate Students. Undergraduate students automatically get the full points from this assignment.

Simple Peer-to-Peer Chat System

Objective:

Implement a basic peer-to-peer chat system using a Peer-to-Peer architectural style in Java. The system should allow peers to connect with each other and exchange messages.

Requirements:

Peer Class:

Implement a Peer class with the following functionalities:

- A peer can act as either a client or a server.
- The peer can connect to another peer using a specified IP address and port.
- The peer can accept incoming connections from other peers.
- Establish a communication channel between connected peers.
- Implement methods for sending and receiving messages.

User Interface:

- Create a simple command-line user interface for interacting with the peer-to-peer system.
- Allow users to enter a message and send it to the connected peer.

Submission:

Please submit the following:
1) A *diagram* depicting the top-level Peer-to-Peer architecture including your components and connectors. An example of such an architecture diagram is Figure 4-22 (Lunar lander as a P2P application).

2) A UML representation of the classes implementing the top-level architecture in 1). An example of the UML class diagram is Figure 4-9. Note that you are not required to use Rational tools to generate the class diagram.

3) A *printout of* the screenshot showing your successful compilation, the screenshot of your program output using your own test data, and your *source code* of all the .java classes;

4) A *mapping* between your source code (e.g., .java classes) and the components and connectors in the architecture depicted in 1) and 2).

Try to name your .java classes consistently with the names of the components/connectors in your architecture.

GHomework 1 Submission:
Please submit the following two files.
a) one PDF file named as "First name-Last name.pdf" containing your answers to Q1~ 4;

b) one Zip file named as "First name-Last name.zip" containing the original source code and executables.