SOFE 4790U Distributed Systems (Fall 2018)

Lab#3 – ZeroMQ

Objective

In this lab you will modify and extend the sample programs of ZeroMQ attached with this lab (ZClient.java, ZServer.java). You will demonstrate your running programs to the TA (50% of the mark), and you will write and submit a lab report (50% of the mark).

Note: The Lab tasks must be completed in the lab. If you don't show up for a lab, you will receive a zero and there is no need for you to submit a lab report.

Tasks

Task #1: Establish the connection (10 Mark)

Use the provided ZServer.java and ZClient.java program. Modify the code in both client and server so that when the client connects to the server, both print a successful message.

Presentation to the TA:
Demonstrate to the TA the running program.

Task #2: Prime number (10 Marks)

In this task you will understand how a client can send a message and get reply from the server. Remember ZeroMQ doesn't know anything about the data you send except its size in bytes. That means you are responsible for formatting it safely so that applications can read it back. Modify the code from task#1 so that client can send an integer number to the server. Server will receive the number and send all the prime number up to the provided number. Client will receive that message and print.
For example: If client sends "10", it will receive "2,3,5,7" from the server.

Presentation to the TA:
Demonstrate to the TA the running program.

Task #3: Repeated Inputs from Client (10 Marks)

In this task the client will send some message repeatedly to the server and server will reply accordingly. Modify the code so that client can take a string as input from the keyboard and send it to server. Server will print the string, reverse it and send back to client. The client will than receive and print the reverse message. Than client will send another message to the server and the process will repeat. If the client sends the message “Close” to the server the process will stop and the connection between server and client will terminate.

Presentation to the TA:
Demonstrate to the TA the running program.

Task#4: Subscribe-Publish (20 Marks)

Develop a new code for both client and server regarding the population update of an area based on zip code. A set of client will subscribe to the server with different zip code taken as input from keyboard. The server will continuously broadcast the update of the population of different area. When the client listen to the stream of updates of the zip code it specified, it will immediately print that.

How can the server determine the zip code and the population of that area?
Tips: Generate random number for the zip code and population from the server(For simplicity declare the zip code as a 4 digit integer number. For example: 1001, 4349 etc.). There can be no start and no end to this stream of updates from the server, like a never ending broadcast.

Presentation to the TA:
Demonstrate to the TA the running program.

Lab Report: 1 to 2 pages max (50 Marks)

In your lab report, for each task:

1- Explain how you accomplished the task.
2- Describe any challenges you faced with the tasks and how you solved them.
3- What did you learn?

Submit the lab report (in Word or PDF) on Blackboard by **11:59pm on Friday, October 26. No late submissions will be accepted no matter what is the reason.**