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EE444 HOMEWORK #2 – SOCKET ASSIGNMENT

General Information

In this assignment I was able to successfully implement

- a server in MATLAB
- a proxy server in python and
- a client in python.

The system supports 4 commands which are, **PUT, ADD, GET, CLR.** Communication between each system is in the form of **"OP=XXX;IND=IND0,IND1,…,INDn;DATA=DATA0,DATA1,…,DATAn".** The system supports up to 5 indexes and data in each command.

Client – Proxy- Server Connection

The server has the IP '127.0.0.1' and opens a socket in port 6002 and the proxy connects to it using the IP and port information. The proxy has 2 sockets, one for connecting to the main server. The other socket has the same IP of '127.0.0.1' and port number 6003 for serving functionality. Finally the client has one client and will connect to port number 6003 of the proxy.

To achieve a successful running communication network, run the server first, then the proxy server. Finally, the client should be run. The program will have information printed on the terminals about connection status.

The proxy server contains 5 slots for data whereas the main server will have 10. The proxy stores these last requested data slots for future use if applicable. If new data is required by the client, then the data is fetched from the main server and overwrites the oldest data slot.

If the proxy server does not have enough information to serve the client, it will act as a client itself and request the actual command to the main server and return the data received from it to serve the actual client.

The client terminal waits for user input and then sends the message to the proxy server and waits for a response to show. The socket makes it possible to pass information between different programming environments and different processes.

Commands

- **PUT Command** *(OP=PUT;IND=IND0,IND1,…,INDn;DATA=DATA0,DATA1,…,DATAn)*
  It saves the data written in the DATA to its respective places, specified in INDEX. Supports up to 5 index-data points. Proxy server and the main server will print database to the console.

- **ADD Command** *(OP=ADD;IND=IND0,IND1,…,INDn;X,X)*
  It takes the index specified in IND part and captures the responding data values from the table and sums these values. It doesn't matter what the client wrote in DATA location. Supports up to 5 index-data points. The data is returned to the client in the receiving message's DATA part.

- **GET Command** *(OP=GET;IND=IND0,IND1,…,INDn;DATA=X,X,X)*
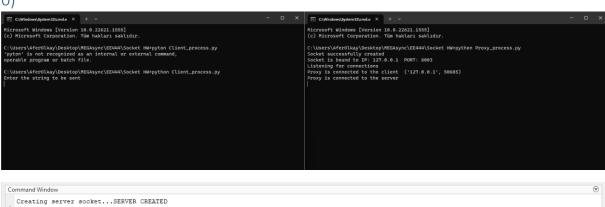 It takes the indexes specified in IND part and captures the responding data values from the table and places these values in the DATA part of the message returned to the client. It doesn't matter what the client wrote in DATA location, it is overwritten in the returning message. Supports up to 5 index-data points. The data is returned to the client in the receiving message's DATA part.

- **CLR Command** *(OP=CLR;IND=X,X,…,X;DATA=X,X,…,X)*
  Clears all the data on the table of the server and initializes all 10 data values to 0. Server will print database to the console.

EXAMPLES

0)

1)

2)

```
OP=PUT;IND=0,1,2;DATA=10,11,12,
Enter the string to be sent
OP=ADD;IND=0,1,2;DATA=;
Received Data is:
OP=ADD;IND=0,1,2;DATA=33;
```

```
Command Window

   Creating server socket...SERVER CREATED
   OP=ADD;IND=0,1,2;DATA=10,20,30;
        0


   OP=ADD;IND=0,1,2;DATA=10,20,30;
        0


   OP=PUT;IND=0,1,2;DATA=10,11,12;
       10     11     12      0      0      0      0      0      0      0


   OP=ADD;IND=0,1,2;DATA=;
       33

fx
```

3)

```
C:\Windows\System32\cmd.e  ×   +  ∨

Microsoft Windows [Version 10.0.22621.1555]
(c) Microsoft Corporation. Tüm hakları saklıdır.

C:\Users\AferOlkay\Desktop\MEGAsync\EE444\Socket HW>python Client_process.py
Enter the string to be sent
OP=PUT;IND=0,1,2;DATA=10,11,12;
Received Data is:
OP=PUT;IND=[0, 1, 2];DATA=[10, 11, 12];
Enter the string to be sent
OP=ADD;IND=0,1,2;DATA=;
Received Data is:
OP=GET;IND=[0, 1, 2];DATA=33;
Enter the string to be sent
```

```
C:\Windows\System32\cmd.e  ×   +  ∨

Microsoft Windows [Version 10.0.22621.1555]
(c) Microsoft Corporation. Tüm hakları saklıdır.

C:\Users\AferOlkay\Desktop\MEGAsync\EE444\Socket HW>python Proxy_process.py
Socket successfully created
Socket is bound to IP: 127.0.0.1  PORT: 6003
Listening for connections
Proxy is connected to the client  ('127.0.0.1', 50703)
Proxy is connected to the server
Command Received from Client:OP=PUT;IND=0,1,2;DATA=10,11,12;
[(0, 10), (1, 11), (2, 12), (3, 0), (4, 0)]
Command Received from Client:OP=ADD;IND=0,1,2;DATA=;
[(0, 10), (1, 11), (2, 12), (3, 0), (4, 0)]
```

```
Command Window

   OP=ADD;IND=0,1,2;DATA=;
       33
```

4)

5)