

CS359 Assignment 3

Client Server Interactor and Calculator

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YouTube Link:

Files attached with this report: 4 different types of servers which would reply based on specs provided and 1 client file which would send queries related to mathematical expressions and the server would respond according to specifications provided...

Setting up the systems:

- Open any number of terminals to run clients and one server.
- You would run python file with 2 arguments namely localhost(for your system's ip) and a port number say

4800

Eg. python client.py localhost 4800

And similarly for server python server1.py localhost 4800...

- After every answer to the query you would be asked whether you want to continue or not for which you can answer by simply pressing Y for Yes and N for No and can continue with the working...
- And finally for closing servers just kill the terminal and you would be done.

So, now we are done with the setting up of the systems in place...

So, now let's jump off to the 1st server that only allows one server at a time for working:

Server1:

The screenshot shows a VS Code editor with a file explorer at the top displaying five files: server4.py, server3.py, server2.py, server1.py, and client.py. The editor is open to client.py, which contains the following code:

```
19 inp = input("Enter message to be evaluated ")
20 c.send(inp.encode())
21
22 answer = c.recv(1024)
23 print("Server replied: " + answer.decode())
24 inp = input("Wanna move forward ? Y/N\n")
25 if (inp == "N"):
26     break
27
28 c.close()
```

Below the editor, the TERMINAL panel shows the execution of the client script. The output is as follows:

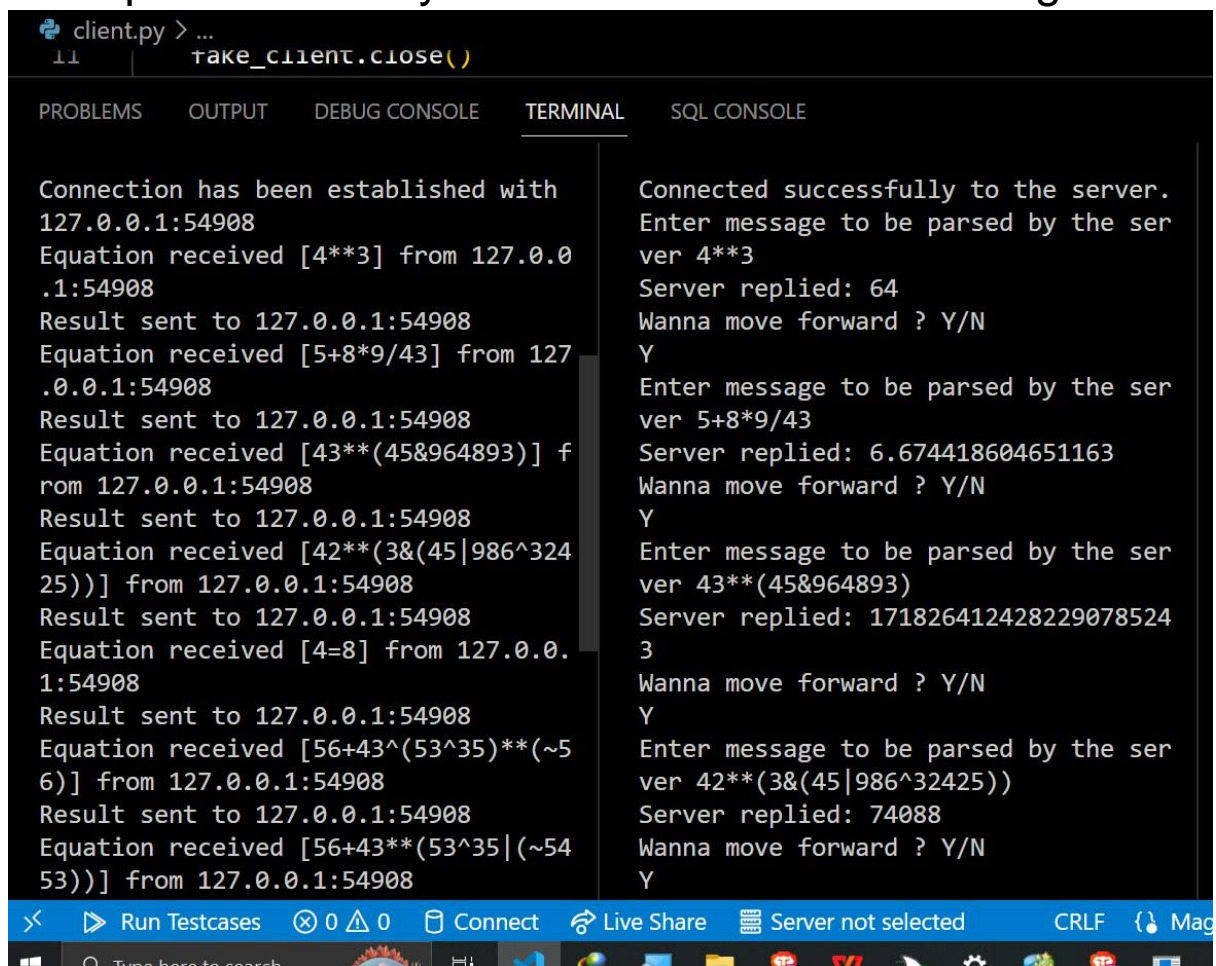
```
py localhost 4800
Binding the Port: 4800
Connection has been established with 127.0.0.1:54907
Connection has been closed with 127.0.0.1:54907
Connection has been established with 127.0.0.1:54908
Equation received [4**3] from 127.0.0.1:54908
Result sent to 127.0.0.1:54908
```

On the right side of the terminal, there are two PowerShell windows. The first window shows the command `python client.py localhost 4800` and its output: `Enter message to be parsed by the server 4**3`, `Server replied: 64`, and `Wanna move forward ? Y/N`. The second window shows an error message: `Error found in connecting socket: [WinError 10061] No connection could be made because the target machine actively refused it`.

Here I am using a fake client to restrict the command execution to only 1 client.

And for evaluating using python eval function, it's a bit unsafe as it can be used to change system settings also like shutting down the system etc, but writing own's function would involve just writing 100's of lines of code for covering every single operation...

Examples with many different test cases including:



```
client.py > ...  
take_client.close()  
  
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE  
  
Connection has been established with 127.0.0.1:54908  
Equation received [4**3] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [5+8*9/43] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [43**(45&964893)] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [42**(3&(45|986^32425))] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [4=8] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [56+43^(53^35)**(~56)] from 127.0.0.1:54908  
Result sent to 127.0.0.1:54908  
Equation received [56+43**(53^35|(~5453))] from 127.0.0.1:54908  
  
Connected successfully to the server.  
Enter message to be parsed by the server 4**3  
Server replied: 64  
Wanna move forward ? Y/N  
Y  
Enter message to be parsed by the server 5+8*9/43  
Server replied: 6.674418604651163  
Wanna move forward ? Y/N  
Y  
Enter message to be parsed by the server 43**(45&964893)  
Server replied: 1718264124282290785243  
Wanna move forward ? Y/N  
Y  
Enter message to be parsed by the server 42**(3&(45|986^32425))  
Server replied: 74088  
Wanna move forward ? Y/N  
Y
```

4**3

5+8*9/43

$43^{**}(45\&964893)$
 $42^{**}(3\&(45|986^{\wedge}32425))$
 $4=8$
 $56+43^{**}(53^{\wedge}35|(\sim 5453))$

Working with server 2

Server2: Everything is same in here except that now many clients can get connected to the mainstream server... Here are the snapshots...

```

19 inp = input("Enter message to be evaluated ")
20 c.send(inp.encode())
21
22 answer = c.recv(1024)

```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** SQL CONSOLE

Connection has been established with 127.0.0.1:55027
 Connection has been closed with 127.0.0.1:55026
 Connection has been established with 127.0.0.1:55028
 Connection has been established with 127.0.0.1:55029
 Connection has been closed with 127.0.0.1:55028
 Connection has been established with 127.0.0.1:55039
 Connection has been established with 127.0.0.1:55040
 Connection has been closed with 127.0.0.1:55039
 Equation received [45^32] from 127.0.0.1:

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 Try the new cross-platform PowerShell https://aka.ms/pscore6
 PS D:\Networks\tut03> python client.py localhost 4800
 Connected successfully to the server.
 Enter message to be evaluated 45^32
 Server replied: 13
 Wanna move forward ? Y/N

Try the new cross-platform PowerShell https://aka.ms/pscore6
 PS D:\Networks\tut03> python client.py localhost 4800
 Connected successfully to the server.
 Enter message to be evaluated 23*2
 Server replied: 46
 Wanna move forward ? Y/N

Try the new cross-platform PowerShell https://aka.ms/pscore6
 PS D:\Networks\tut03> python client.py localhost 4800
 Connected successfully to the server.
 Enter message to be evaluated 3+4
 Server replied: 7
 Wanna move forward ? Y/N

Run Testcases 0 0 0 Connect Live Share Server not selected CRLF MagicPython Select Interpreter Go Live Prettier

Examples used:(Combination of BODMAS operators and Bitwise operators for checking with various use cases)

$43^{\wedge}(5435^{\wedge}242\&4325|342)$
 $3423^{*}(242\sim 324^{\wedge}4244)$
 $4234\&535^{\wedge}23^{\wedge}34^{\wedge}(\sim 453)$
 $234^{\wedge}24\&24|24342^{\wedge}545$

Now, moving on with server3.py, which uses a select algorithm to choose which one to give right to read and write at a certain time, since I am the only person opting for the multiple clients, the

difference would be not that clear, but while explaining in the video, it would be quite evident...

```

client.py > ...
25 if (inp == 'n') :
26     break
27
28 c.close()
29

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE

score6

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 48^34&343

Server replied: 50

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342^24&34

Server replied: 342

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342&34|(~432)

Server replied: -433

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 2848682^343&32|23^3

Server replied: 2848702

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 3492*(~453)

Server replied: -1585368

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 34*242279&34|23^23

Server replied: 34

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342&42*(~34)

Server replied: 66

Wanna move forward ? Y/N

Y

Examples used:

24**(243/324)

2848682^343&32|23^3

48^34&343

3492*(~453)

34*242279&34|23^23

342&42*(~34)

```

Equation received [48^34&343] from 127.0.0.1:55140
Result sent to 127.0.0.1:55140
Equation received [342^24&34] from 127.0.0.1:55142
Result sent to 127.0.0.1:55142
Equation received [342&34|(~432)] from 127.0.0.1:55146
Result sent to 127.0.0.1:55146
Equation received [3492*(~453)] from 127.0.0.1:55140
Result sent to 127.0.0.1:55140
Equation received [2848682^343&32|23^3] from 127.0.0.1:55142
Result sent to 127.0.0.1:55142

```

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 48^34&343

Server replied: 50

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342^24&34

Server replied: 342

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342&34|(~432)

Server replied: -433

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 2848682^343&32|23^3

Server replied: 2848702

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 3492*(~453)

Server replied: -1585368

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 34*242279&34|23^23

Server replied: 34

Wanna move forward ? Y/N

Y

PS D:\Networks\tut03> python client.py localhost 4800

Connected successfully to the server.

Enter message to be evaluated 342&42*(~34)

Server replied: 66

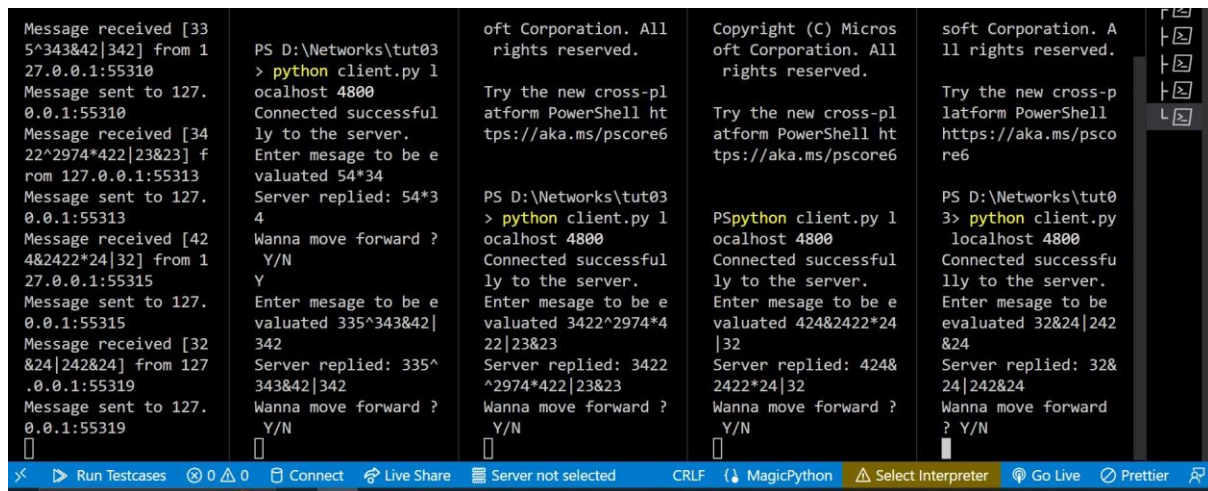
Wanna move forward ? Y/N

Y

Now, with server4.py we just have to echo the statements that we are getting from the clients, so here we go...

Server4:

It's just printing out whatever you are getting from the client...



```
Message received [335^343&42|342] from 127.0.0.1:55310
Message sent to 127.0.0.1:55310
Message received [3422^2974*422|23&23] from 127.0.0.1:55313
Message sent to 127.0.0.1:55313
Message received [424&2422*24|32] from 127.0.0.1:55315
Message sent to 127.0.0.1:55315
Message received [32&24|242&24] from 127.0.0.1:55319
Message sent to 127.0.0.1:55319
PS D:\Networks\tut03> python client.py 1
localhost 4800
Connected successfully to the server.
Enter message to be evaluated 54*34
Server replied: 54*34
Wanna move forward ? Y/N
Y
Enter message to be evaluated 335^343&42|342
Server replied: 335^343&42|342
Wanna move forward ? Y/N
Y/N
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS D:\Networks\tut03> python client.py 1
localhost 4800
Connected successfully to the server.
Enter message to be evaluated 3422^2974*422|23&23
Server replied: 3422^2974*422|23&23
Wanna move forward ? Y/N
Y/N
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Try the new cross-platform PowerShell https://aka.ms/pscore6
PSpython client.py 1
localhost 4800
Connected successfully to the server.
Enter message to be evaluated 424&2422*24|32
Server replied: 424&2422*24|32
Wanna move forward ? Y/N
Y/N
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Try the new cross-platform PowerShell https://aka.ms/pscore6
PS D:\Networks\tut03> python client.py 1
localhost 4800
Connected successfully to the server.
Enter message to be evaluated 32&24|242&24
Server replied: 32&24|242&24
Wanna move forward ? Y/N
? Y/N
```

Explanation in the YT video...

THE END THANKYOU

