

CS359 Assignment 3

Client Server Interactor and Calculator

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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

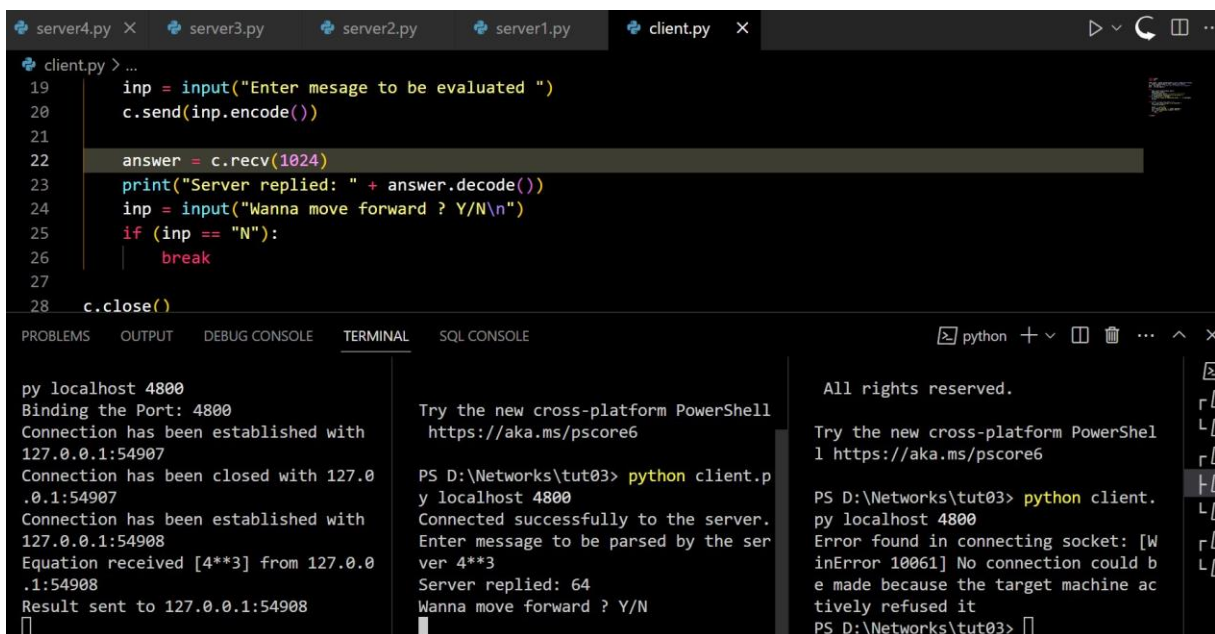
And similarly for server `python server1.py localhost 4800...`

- 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 containing `server4.py`, `server3.py`, `server2.py`, `server1.py`, and `client.py`. The `client.py` file is open, showing 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` tab is active, displaying the output of running `python client.py` on a Windows system. The output shows the client binding to port 4800, establishing a connection with `127.0.0.1:54907`, receiving the message `4**3`, and sending the result `64`. The prompt `Wanna move forward ? Y/N` is visible at the end of the output.

```
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
Wanna move forward ? Y/N
```

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 > ...
11 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)

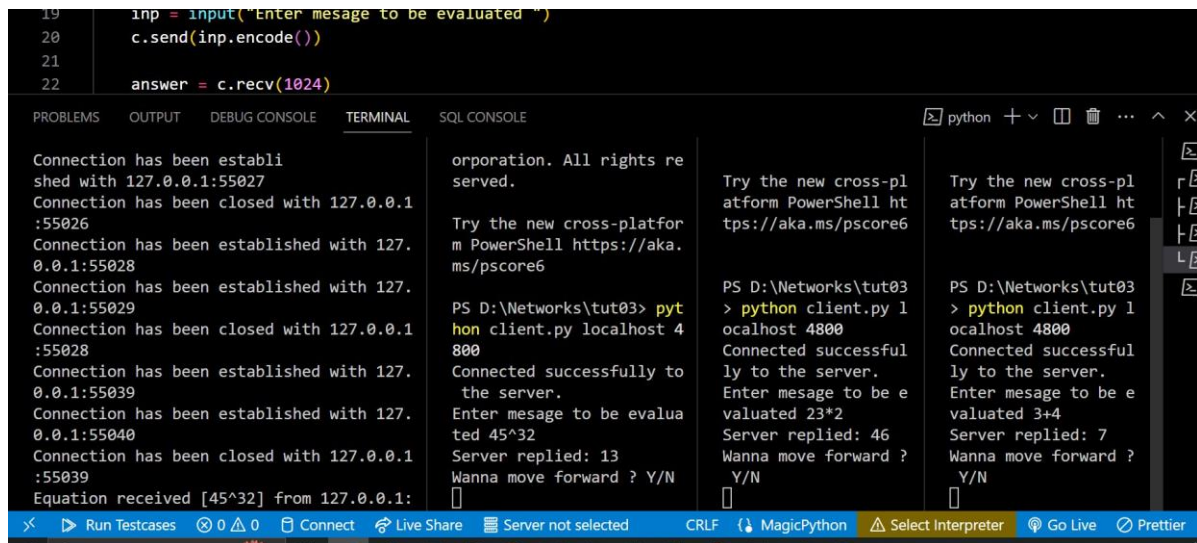
42**(3&(45|986^32425))

4=8

$56 + 43^{**}(53^{35}|(\sim 5453))$

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)

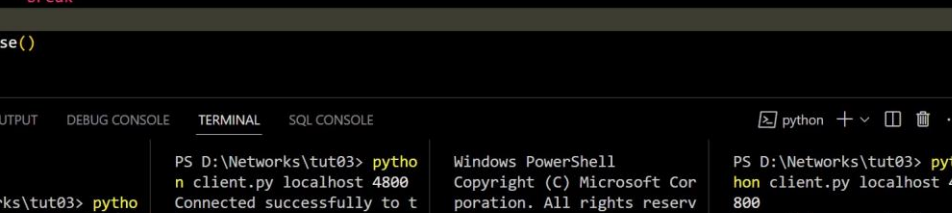
$43^{(5435^{242} \& 4325|342)}$

$3423^{*(242 \sim 324^{4244})}$

$4234 \& 535^{23^{34^{(\sim 453)}}$

$234^{24 \& 24|24342^{545}}$

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...



The screenshot shows the VS Code editor with a Python file named `client.py` and a terminal window. The code in `client.py` is as follows:

```
1 client.py > ...  
25     if __name__ == '__main__':  
26         inp = input('Enter message to be evaluated: ')  
27         break  
28     c.close()  
29
```

The terminal window shows the execution of the script. It prompts the user to enter a message to be evaluated. The user enters `48^34&343`. The script then connects to the server and displays the result: `342^24&34`. The terminal output is as follows:

```
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  
Try the new cross-platform PowerShell https://aka.ms/powershell  
score6  
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
```

Examples used:

$$24^{**}(243/324)$$

2848682^343&32|23^3

48^34&343

3492*(~453)

$$34^{*}242279\&34|23^{^}23$$

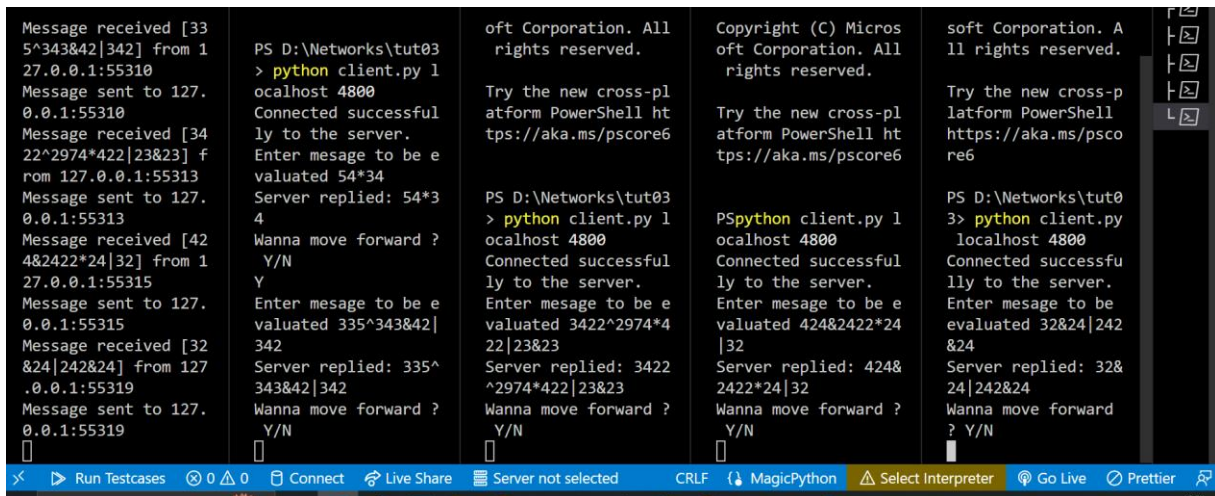
342&42*(~34)

Equation received [48^34834 3] from 127.0.0.1:55140 Result sent to 127.0.0.1:55140 Equation received [342^24834] 4] from 127.0.0.1:55142 Result sent to 127.0.0.1:55142 Equation received [342834](~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 [2848682^343832 23^*3] from 127.0.0.1:55142 Result sent to 127.0.0.1:55142	n client.py localhost 4800 Connected successfully to the server. Enter message to be evaluated d 48^348343 Server replied: 50 Wanna move forward ? Y/N Y Enter message to be evaluated d 3492*(~453) Server replied: -1585368 Wanna move forward ? Y/N Y Enter message to be evaluated d 34^242279834 23^*23 Server replied: 34 Wanna move forward ? Y/N Y Enter message to be evaluated d 342842*(~34) Server replied: 66	Connected successfully to the server. Enter message to be evaluated d 342^24834 Server replied: 342 Wanna move forward ? Y/N Y Enter message to be evaluated d 2848682^343832 23^*3 Server replied: Please enter a valid expression. Wanna move forward ? Y/N 2848682^343832 23^*3 Enter message to be evaluated d 2848682^343832 23^*3 Server replied: 2848702 Wanna move forward ? Y/N Y Enter message to be evaluated d 2848682^343832 23^*3	Enter message to be evaluated d 342834 (~432) Server replied: -433 Wanna move forward ? Y/N Y Enter message to be evaluated d 349^0939472 Server replied: Please enter a valid expression. Wanna move forward ? Y/N Y Enter message to be evaluated d 24**(243/324) Server replied: 10.843224043318138 Wanna move forward ? Y/N Y Enter message to be evaluated d
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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 [33
5^343&42|342] from 1
27.0.0.1:55310
Message sent to 127.
0.0.1:55310
Message received [34
22^2974*422|23&23] f
rom 127.0.0.1:55313
Message sent to 127.
0.0.1:55313
Message received [42
4&2422*24|32] from 1
27.0.0.1:55315
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 l
ocalhost 4800
Connected successfu
lly to the server.
Enter message to be e
valuated 54*34
Server replied: 54*3
4
Wanna move forward ?
Y/N
Y
Enter message to be e
valuated 335^343&42|
342
Server replied: 335^
343&42|342
Wanna move forward ?
Y/N
Y/N
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atform PowerShell ht
tps://aka.ms/pscore6
PS D:\Networks\tut03
> python client.py l
ocalhost 4800
Connected successfu
lly to the server.
Enter message to be e
valuated 3422^2974*4
22|23&23
Server replied: 3422
^2974*422|23&23
Wanna move forward ?
Y/N
Y/N
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Try the new cross-pl
atform PowerShell ht
tps://aka.ms/pscore6
PSpython client.py l
ocalhost 4800
Connected successfu
lly to the server.
Enter message to be e
valuated 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-p
latform PowerShell
https://aka.ms/psco
re6
PS D:\Networks\tut0
3> python client.py
localhost 4800
Connected successfu
lly 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

