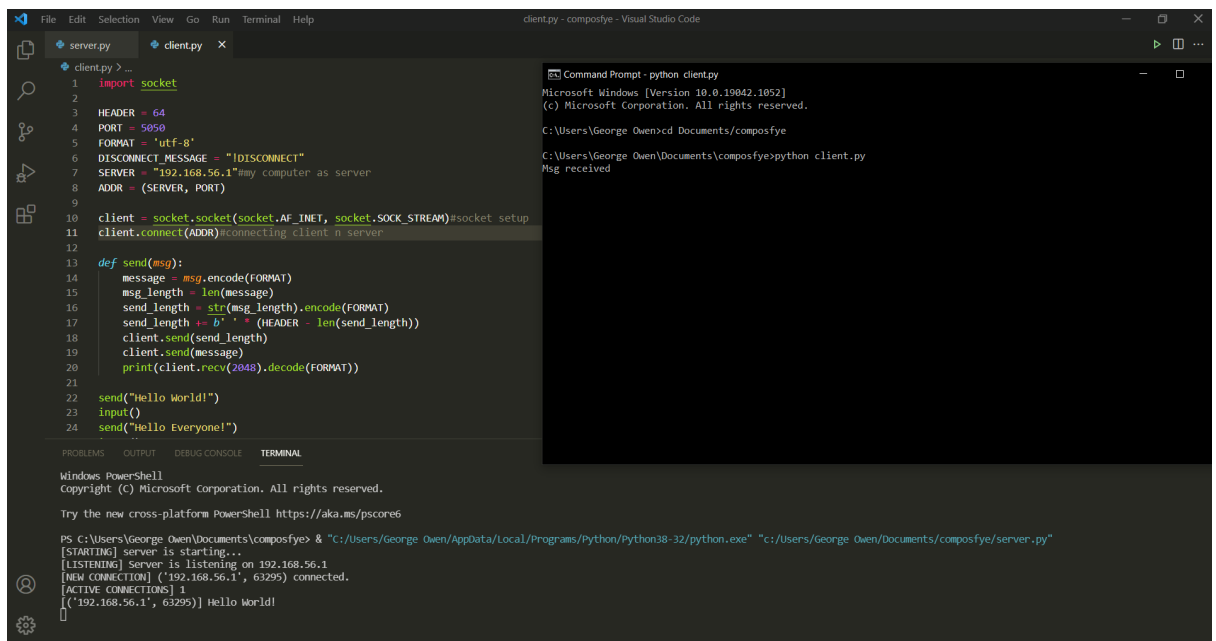


COMP6504 - Computer Architecture and Operating Systems Final Exams

By George, Aqsha, Faith

1. Socket and multithreading programming is the topic I chose. Here are proofs that the program is working.



```
client.py > ...
1 import socket
2
3 HEADER = 64
4 PORT = 5050
5 FORMAT = 'utf-8'
6 DISCONNECT_MESSAGE = "DISCONNECT"
7 SERVER = "192.168.56.1" # my computer as server
8 ADDR = (SERVER, PORT)
9
10 client = socket.socket(socket.AF_INET, socket.SOCK_STREAM) # socket setup
11 client.connect(ADDR) # connecting client to server
12
13 def send(msg):
14     message = msg.encode(FORMAT)
15     msg_length = len(message)
16     send_length = str(msg_length).encode(FORMAT)
17     send_length += b' ' * (HEADER - len(send_length))
18     client.send(send_length)
19     client.send(message)
20     print(client.recv(2048).decode(FORMAT))
21
22 send("Hello World!")
23 input()
24 send("Hello Everyone!")
```

```
Command Prompt - python client.py
Microsoft Windows [Version 10.0.19042.1052]
(c) Microsoft Corporation. All rights reserved.

C:\Users\George Owen>cd Documents\composfye
C:\Users\George Owen\Documents\composfye>python client.py
Msg received
```

```
Windows PowerShell
Copyright (c) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\George Owen\Documents\composfye> & "C:/Users/George Owen/AppData/Local/Programs/Python/Python38-32/python.exe" "c:/Users/George Owen/Documents/composfye/server.py"
[STARTING] server is starting...
[LISTENING] Server is listening on 192.168.56.1
[NEW CONNECTION] ('192.168.56.1', 63295) connected.
[ACTIVE CONNECTIONS] 1
(['192.168.56.1', 63295]) Hello World!
```

As seen in the image, when I start the server from VS code terminal then run client.py from command prompt, the following message is printed. This shows that the client is successfully able to connect to the server.

```
[NEW CONNECTION] ('192.168.56.1', 63295) connected.
[ACTIVE CONNECTIONS] 1
(['192.168.56.1', 63295]) Hello World!
```

```
server.py
1 import socket
2 import threading
3
4 HEADER = 64#64bytes
5 PORT = 5890
6 SERVER = socket.gethostbyname(socket.gethostname()) #togetipadressofthecomput
7 ADDR = (SERVER, PORT)
8 FORMAT = 'utf-8'
9 DISCONNECT_MESSAGE = "!DISCONNECT"#revise this message, disconnect immediat
10 #print(SERVER) this line will print 192.168.56.1 (my computer's ip)(can be di
11
12 server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)#made socket with t
13 server.bind(ADDR)#bind server with ADDR
14
15 def handle_client(conn, addr):#connection and address Handles connection betw
16     print(f"[NEW CONNECTION] {addr} connected.")
17
18     connected = True
19     while connected:
20         msg_length = conn.recv(HEADER).decode(FORMAT)#program not pass this l
21         if msg_length:
22             msg_length = int(msg_length)#tells us length of msg
23             msg = conn.recv(msg_length).decode(FORMAT)#decode using utf8
24
25 client.py
6 DISCONNECT_MESSAGE = "!DISCONNECT"
7 SERVER = "192.168.56.1"#my computer as server
8 ADDR = (SERVER, PORT)
9
10 client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)#socket setup
11 client.connect(ADDR)#connecting client n server
12
13 def send(msg):
14     message = msg.encode(FORMAT)
15     msg_length = len(message)
16     send_length = str(msg_length).encode(FORMAT)#encodeinutf8
17     send_length += b' ' * (HEADER - len(send_length))#to make the msg the cor
18     client.send(send_length)
19     client.send(message)
20     print(client.recv(2048).decode(FORMAT))
21
22 send("Hello World!")
23 input()
24 send("Hello World Second Message!")
25 input()
26 send("Hello World Third Message!")
27
28 send(DISCONNECT_MESSAGE)
```

```
PS C:\Users\George Owen\Documents\composfye> & "C:/Users/George Owen/AppData/Local/Programs/Python/Python38-64/Python.exe" python client.py
[STARTING] server is starting...
[LISTENING] Server is listening on 192.168.56.1
[NEW CONNECTION] ('192.168.56.1', 58994) connected.
[ACTIVE CONNECTIONS] 1
[('192.168.56.1', 58994)] Hello World!
[('192.168.56.1', 58994)] Hello World Second Message!
[('192.168.56.1', 58994)] Hello World Third Message!
[('192.168.56.1', 58994)] !DISCONNECT
```

The picture shows the client sending multiple messages to the server and then disconnecting from the server when given the DISCONNECT_MESSAGE.

[LISTENING] Server is listening on 192.168.56.1
[NEW CONNECTION] ('192.168.56.1', 58994) connected.
[ACTIVE CONNECTIONS] 1
[('192.168.56.1', 58994)] Hello World!
[('192.168.56.1', 58994)] Hello World Second Message!
[('192.168.56.1', 58994)] Hello World Third Message!
[('192.168.56.1', 58994)] !DISCONNECT