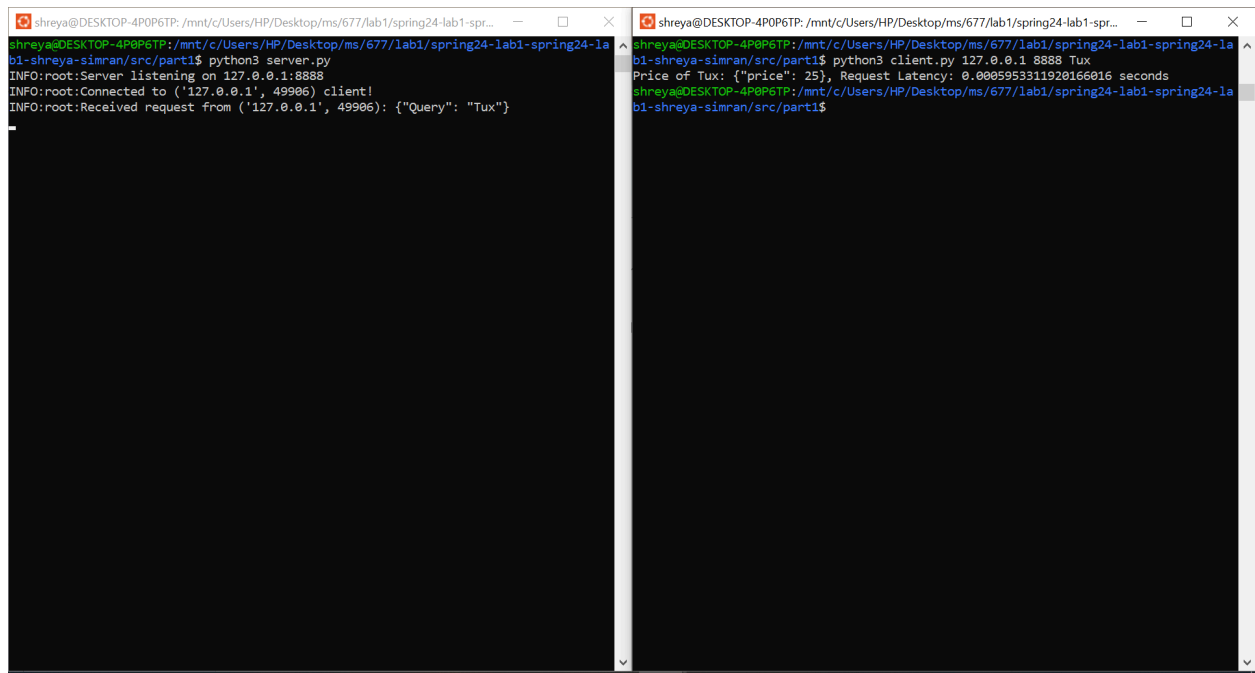


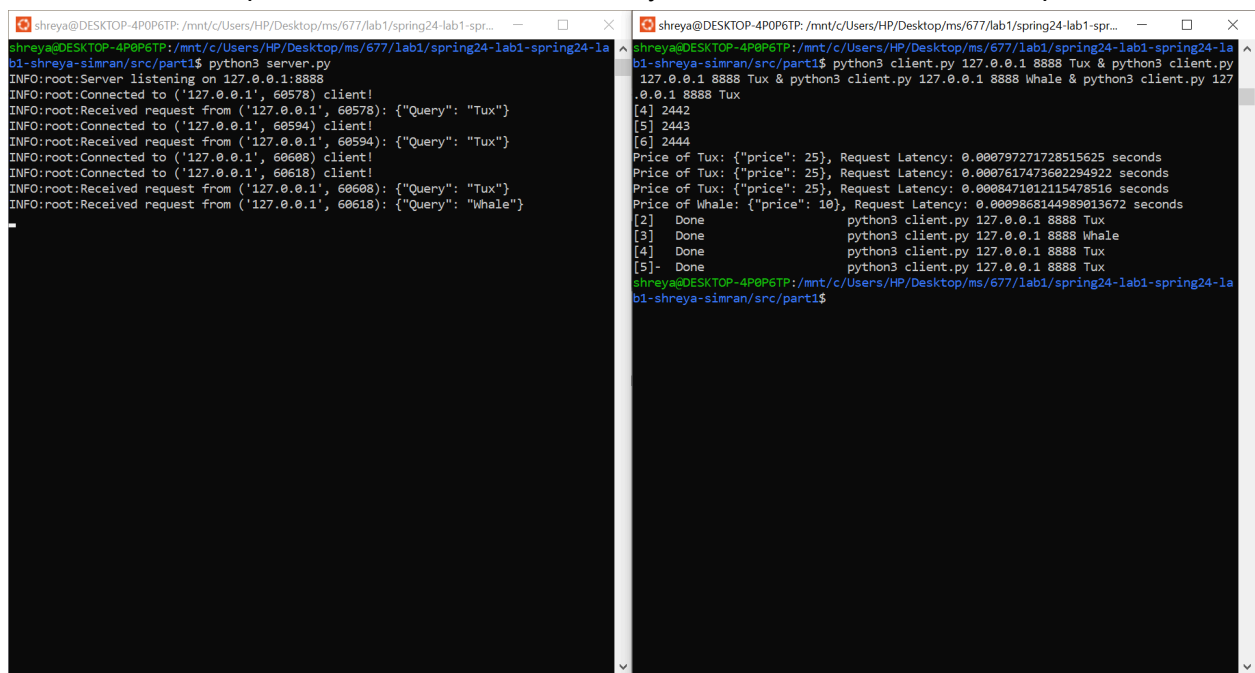
When we run single client instance and server on the same setup



The image shows two terminal windows side-by-side. The left window is the server's terminal, and the right window is the client's terminal. Both are running on a system named 'shreya@DESKTOP-4P0P6TP'.

```
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 server.py  
INFO:root:Server listening on 127.0.0.1:8888  
INFO:root:Connected to ('127.0.0.1', 49906) client!  
INFO:root:Received request from ('127.0.0.1', 49906): {"Query": "Tux"}  
b1-shreya-simran/src/part1$  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 client.py 127.0.0.1 8888 Tux  
Price of Tux: {"price": 25}, Request Latency: 0.0005953311920166016 seconds  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

When we run multiple client instances concurrently and server on the same setup



The image shows two terminal windows side-by-side. The left window is the server's terminal, and the right window is the client's terminal. Both are running on a system named 'shreya@DESKTOP-4P0P6TP'.

```
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 server.py  
INFO:root:Server listening on 127.0.0.1:8888  
INFO:root:Connected to ('127.0.0.1', 60578) client!  
INFO:root:Received request from ('127.0.0.1', 60578): {"Query": "Tux"}  
INFO:root:Connected to ('127.0.0.1', 60594) client!  
INFO:root:Received request from ('127.0.0.1', 60594): {"Query": "Tux"}  
INFO:root:Connected to ('127.0.0.1', 60608) client!  
INFO:root:Connected to ('127.0.0.1', 60618) client!  
INFO:root:Received request from ('127.0.0.1', 60608): {"Query": "Tux"}  
INFO:root:Received request from ('127.0.0.1', 60618): {"Query": "Whale"}  
b1-shreya-simran/src/part1$  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 client.py 127.0.0.1 8888 Tux & python3 client.py 127.0.0.1 8888 Tux & python3 client.py 127.0.0.1 8888 Whale & python3 client.py 127.0.0.1 8888 Tux  
[4] 2442  
[5] 2443  
[6] 2444  
Price of Tux: {"price": 25}, Request Latency: 0.000797271728515625 seconds  
Price of Tux: {"price": 25}, Request Latency: 0.0007617473602294922 seconds  
Price of Tux: {"price": 25}, Request Latency: 0.0008471012115478516 seconds  
Price of Whale: {"price": 10}, Request Latency: 0.0009868144989013672 seconds  
[2] Done python3 client.py 127.0.0.1 8888 Tux  
[3] Done python3 client.py 127.0.0.1 8888 Whale  
[4] Done python3 client.py 127.0.0.1 8888 Tux  
[5] Done python3 client.py 127.0.0.1 8888 Tux  
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

When we run single client instance and server on different setups

The screenshot shows a VS Code editor with two terminal windows. The left terminal, titled 'lab1 [SSH: elnux.cs.umass.edu]', shows the output of a Python server script. The right terminal, titled 'shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...', shows the output of a Python client script. The server log shows it listening on 128.119.243.168:8888 and receiving a request from '128.119.202.86', 7523 with the query 'Tux'. The client log shows it sending a request to 128.119.243.168:8888 for 'Tux' and receiving a response with a price of 25 and a request latency of 0.0031592845916748047 seconds.

```
sbirthare@elinux3:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/p
o art1$ python3 server.py
INFO:root:Server listening on 128.119.243.168:8888
INFO:root:Connected to ('128.119.202.86', 7523) client!
INFO:root:Received request from ('128.119.202.86', 7523): {"Query": "Tux"}
[]

shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-la
b1-shreya-simran/src/part1$ python3 client.py 128.119.243.168 8888 Tux
Price of Tux: {"price": 25}, Request Latency: 0.0031592845916748047 seconds
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-la
b1-shreya-simran/src/part1$
```

When we run multiple client instances concurrently and server on different setups

The screenshot shows a VS Code editor with two terminal windows. The left terminal, titled 'lab1 [SSH: elnux.cs.umass.edu]', shows the output of a Python server script. The right terminal, titled 'shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...', shows the output of multiple concurrent Python client scripts. The server log shows it listening on 128.119.243.168:8888 and receiving multiple requests from '128.119.202.86' with queries 'Tux' and 'Whale'. The client log shows multiple instances of the client script running concurrently, sending requests to 128.119.243.168:8888 for 'Tux' and 'Whale' and receiving responses with prices and request latencies.

```
sbirthare@elinux3:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/p
o art1$ python3 server.py
INFO:root:Server listening on 128.119.243.168:8888
INFO:root:Connected to ('128.119.202.86', 3051) client!
INFO:root:Connected to ('128.119.202.86', 20390) client!
INFO:root:Received request from ('128.119.202.86', 3051): {"Query": "Tux"}
INFO:root:Received request from ('128.119.202.86', 20390): {"Query": "Whale"}
INFO:root:Received request from ('128.119.202.86', 17939) client!
INFO:root:Received request from ('128.119.202.86', 17939): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 51901) client!
INFO:root:Received request from ('128.119.202.86', 51901): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 57308) client!
INFO:root:Received request from ('128.119.202.86', 57308): {"Query": "Whale"}
[]

shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr...
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-la
b1-shreya-simran/src/part1$ python3 client.py 128.119.243.168 8888 Tux & python3 cli
ent.py 128.119.243.168 8888 Tux & python3 client.py 128.119.243.168 8888 Whale & pyt
hon3 client.py 128.119.243.168 8888 Whale & python3 client.py 128.119.243.168 8888
Tux
[1] 2457
[2] 2458
[3] 2459
[4] 2460
Price of Tux: {"price": 25}, Request Latency: 0.008396625518798828 seconds
Price of Whale: {"price": 10}, Request Latency: 0.008445501327514648 seconds
Price of Tux: {"price": 25}, Request Latency: 0.01247406005859375 seconds
Price of Tux: {"price": 25}, Request Latency: 0.009788274765014648 seconds
Price of Whale: {"price": 10}, Request Latency: 0.010990142822265625 seconds
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-la
b1-shreya-simran/src/part1$
```

The screenshot displays a terminal window with a dark background and light-colored text. The terminal is split into two panes. The left pane shows the output of a Python server script, and the right pane shows the output of a Python client script.

Left Pane (Server Output):

```
sbirthare@linux3:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/p
art1$ python3 server.py
INFO:root:Server listening on 128.119.243.168:8888
INFO:root:Connected to ('128.119.202.86', 30399) client!
INFO:root:Connected to ('128.119.202.86', 26517) client!
INFO:root:Received request from ('128.119.202.86', 30399): {"Query": "Whale"}
INFO:root:Received request from ('128.119.202.86', 26517): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 43915) client!
INFO:root:Received request from ('128.119.202.86', 43915): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 53739) client!
INFO:root:Received request from ('128.119.202.86', 53739): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 47335) client!
INFO:root:Received request from ('128.119.202.86', 47335): {"Query": "Whale"}
INFO:root:Connected to ('128.119.202.86', 10907) client!
INFO:root:Received request from ('128.119.202.86', 10907): {"Query": "Whale"}
INFO:root:Connected to ('128.119.202.86', 25646) client!
INFO:root:Received request from ('128.119.202.86', 25646): {"Query": "Whale"}
INFO:root:Connected to ('128.119.202.86', 46472) client!
INFO:root:Received request from ('128.119.202.86', 46472): {"Query": "Dog"}
INFO:root:Connected to ('128.119.202.86', 4145) client!
INFO:root:Received request from ('128.119.202.86', 4145): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 41318) client!
INFO:root:Received request from ('128.119.202.86', 41318): {"Query": "Whale"}
INFO:root:Connected to ('128.119.202.86', 10965) client!
INFO:root:Received request from ('128.119.202.86', 10965): {"Query": "Tux"}
INFO:root:Connected to ('128.119.202.86', 33747) client!
INFO:root:Received request from ('128.119.202.86', 33747): {"Query": "Tux"}
[]
```

Right Pane (Client Output):

```
shreya@DESKTOP-4P06P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr
ing24-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.168 8888 Tux,Dog & python3
client.py 128.119.243.168 8888 Tux,Whale,Whale & python3 client.py 128.119.243.168
8888 Whale,Whale,Tux,Tux & python3 client.py 128.119.243.168 8888 Tux & python3 clie
nt.py 128.119.243.168 8888 Tux,Whale
[5] 2464
[6] 2465
[7] 2466
[8] 2467
Price of Whale: {"price": 10}, Request Latency: 0.006455421447753906 seconds
Price of Tux: {"price": 25}, Request Latency: 0.006569862365722656 seconds
Price of Tux: {"price": 25}, Request Latency: 0.00413966178994043 seconds
Price of Tux: {"price": 25}, Request Latency: 0.013367176055908293 seconds
Price of Whale: {"price": 10}, Request Latency: 0.010568857192993164 seconds
Price of Whale: {"price": 10}, Request Latency: 0.009657144546508789 seconds
Price of Whale: {"price": 10}, Request Latency: 0.01454305648803711 seconds
Price of Dog: {"Dog": "Does Not exist in Catalog"}, Request Latency: 0.0093271732330
32227 seconds
Price of Tux: {"price": 25}, Request Latency: 0.011250734329223633 seconds
Price of Whale: {"price": 10}, Request Latency: 0.008555173873901367 seconds
Price of Tux: {"price": 25}, Request Latency: 0.0046994686126708984 seconds
[1] Done python3 client.py 128.119.243.168 8888 Tux
[2] Done python3 client.py 128.119.243.168 8888 Tux
[3] Done python3 client.py 128.119.243.168 8888 Whale
[4] Done python3 client.py 128.119.243.168 8888 Whale
shreya@DESKTOP-4P06P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spr
ing24-lab1-shreya-simran/src/part1$ Price of Tux: {"price": 25}, Request Latency: 0.00274610
5194091797 seconds
```