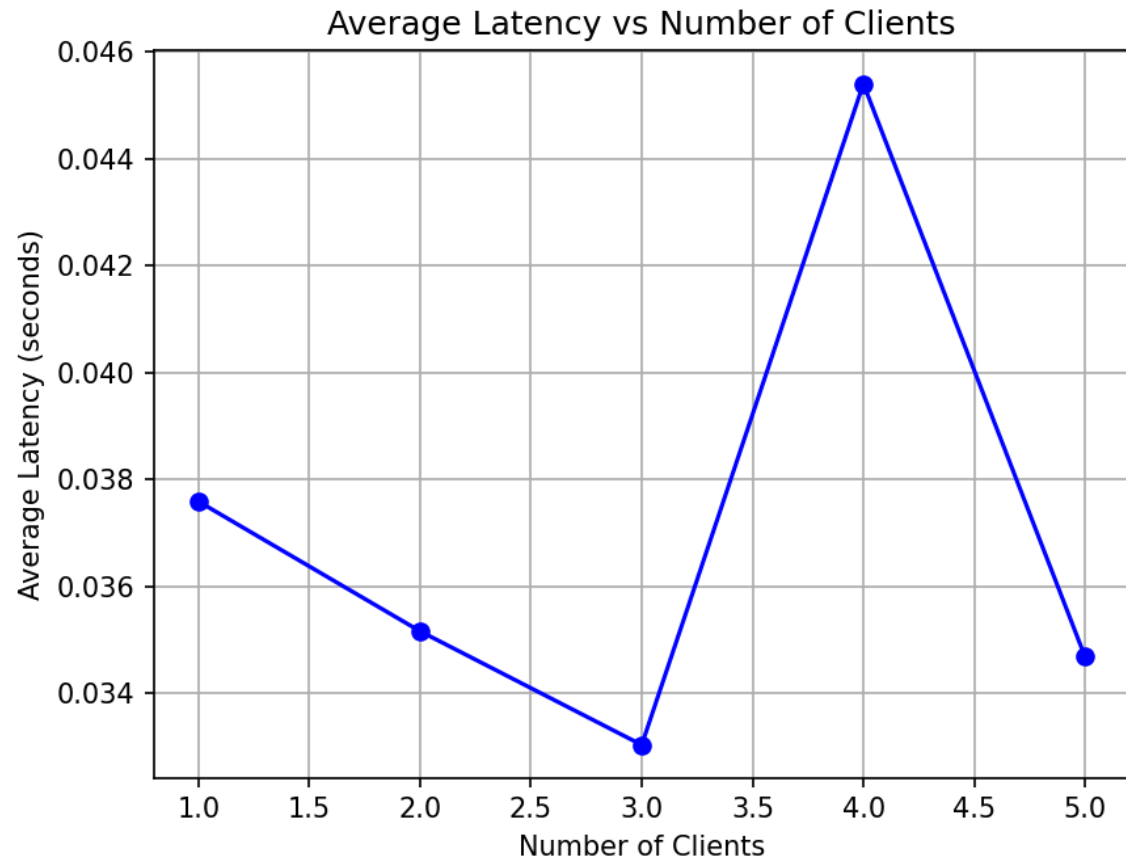
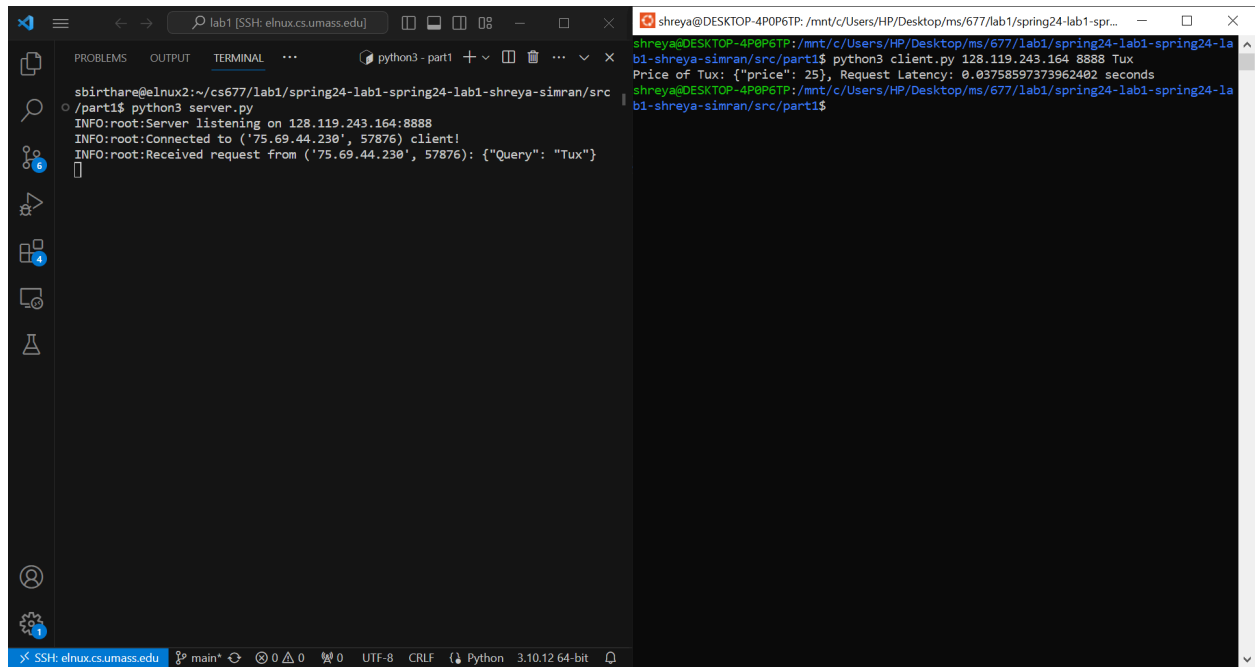


Latency vs Number of Clients graph for Part 1

Figure 1



When num of concurrent clients = 1

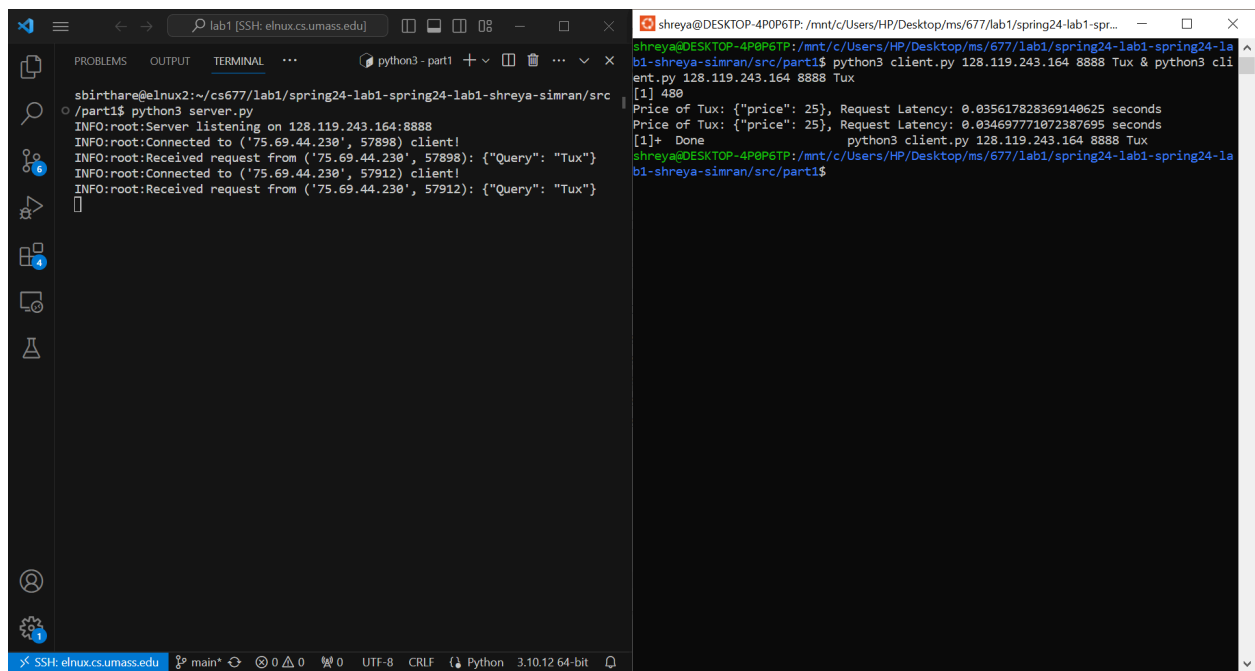


The screenshot shows a VS Code interface with two terminal windows. The left terminal, titled 'lab1 [SSH: elnux.cs.umass.edu]', shows the output of a Python server script. It starts with 'INFO:root:Server listening on 128.119.243.164:8888', followed by 'INFO:root:Connected to ('75.69.44.230', 57876) client!', and then 'INFO:root:Received request from ('75.69.44.230', 57876): {"Query": "Tux"}'. 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. It displays 'Price of Tux: {"price": 25}, Request Latency: 0.03758597373962402 seconds' and then 'shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1\$'.

```
sbirthare@elnux2:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src
/part1$ python3 server.py
INFO:root:Server listening on 128.119.243.164:8888
INFO:root:Connected to ('75.69.44.230', 57876) client!
INFO:root:Received request from ('75.69.44.230', 57876): {"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-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.164 8888 Tux
Price of Tux: {"price": 25}, Request Latency: 0.03758597373962402 seconds
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

When num of concurrent clients = 2

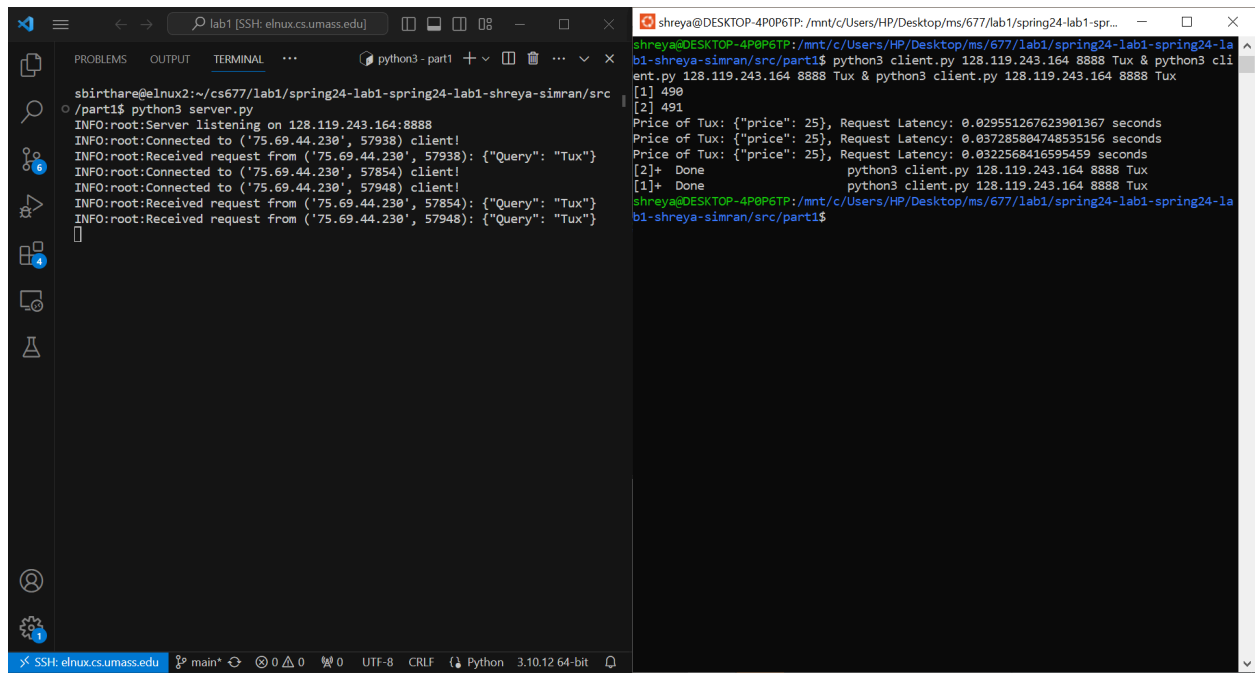


The screenshot shows a VS Code interface with two terminal windows. The left terminal, titled 'lab1 [SSH: elnux.cs.umass.edu]', shows the output of a Python server script. It starts with 'INFO:root:Server listening on 128.119.243.164:8888', followed by 'INFO:root:Connected to ('75.69.44.230', 57898) client!', then 'INFO:root:Received request from ('75.69.44.230', 57898): {"Query": "Tux"}', and finally 'INFO:root:Connected to ('75.69.44.230', 57912) client!'. 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. It displays 'Price of Tux: {"price": 25}, Request Latency: 0.035617828369140625 seconds', then 'Price of Tux: {"price": 25}, Request Latency: 0.034697771072387695 seconds', and finally '[1]+ Done python3 client.py 128.119.243.164 8888 Tux'.

```
sbirthare@elnux2:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src
/part1$ python3 server.py
INFO:root:Server listening on 128.119.243.164:8888
INFO:root:Connected to ('75.69.44.230', 57898) client!
INFO:root:Received request from ('75.69.44.230', 57898): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57912) client!
INFO:root:Received request from ('75.69.44.230', 57912): {"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-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.164 8888 Tux & python3 cli
ent.py 128.119.243.164 8888 Tux
[1] 480
Price of Tux: {"price": 25}, Request Latency: 0.035617828369140625 seconds
Price of Tux: {"price": 25}, Request Latency: 0.034697771072387695 seconds
[1]+ Done python3 client.py 128.119.243.164 8888 Tux
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

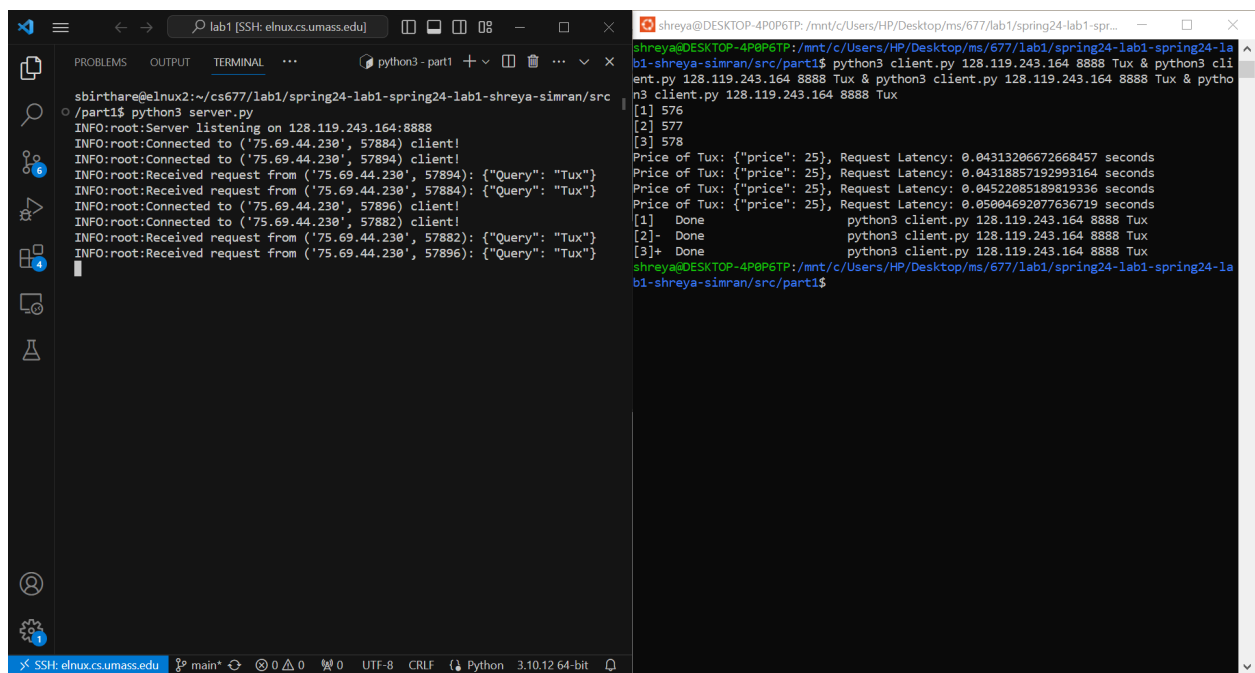
When num of concurrent clients = 3



```
sbirthare@elinux2:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src
/part1$ python3 server.py
INFO:root:Server listening on 128.119.243.164:8888
INFO:root:Connected to ('75.69.44.230', 57938) client!
INFO:root:Received request from ('75.69.44.230', 57938): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57854) client!
INFO:root:Connected to ('75.69.44.230', 57948) client!
INFO:root:Received request from ('75.69.44.230', 57854): {"Query": "Tux"}
INFO:root:Received request from ('75.69.44.230', 57948): {"Query": "Tux"}

shreya@DESKTOP-4P0P6TP:/mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux
[1] 490
[2] 491
Price of Tux: {"price": 25}, Request Latency: 0.029551267623901367 seconds
Price of Tux: {"price": 25}, Request Latency: 0.037285804748535156 seconds
Price of Tux: {"price": 25}, Request Latency: 0.0322568416595459 seconds
[2]+ Done python3 client.py 128.119.243.164 8888 Tux
[1]+ Done python3 client.py 128.119.243.164 8888 Tux
shreya@DESKTOP-4P0P6TP:/mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

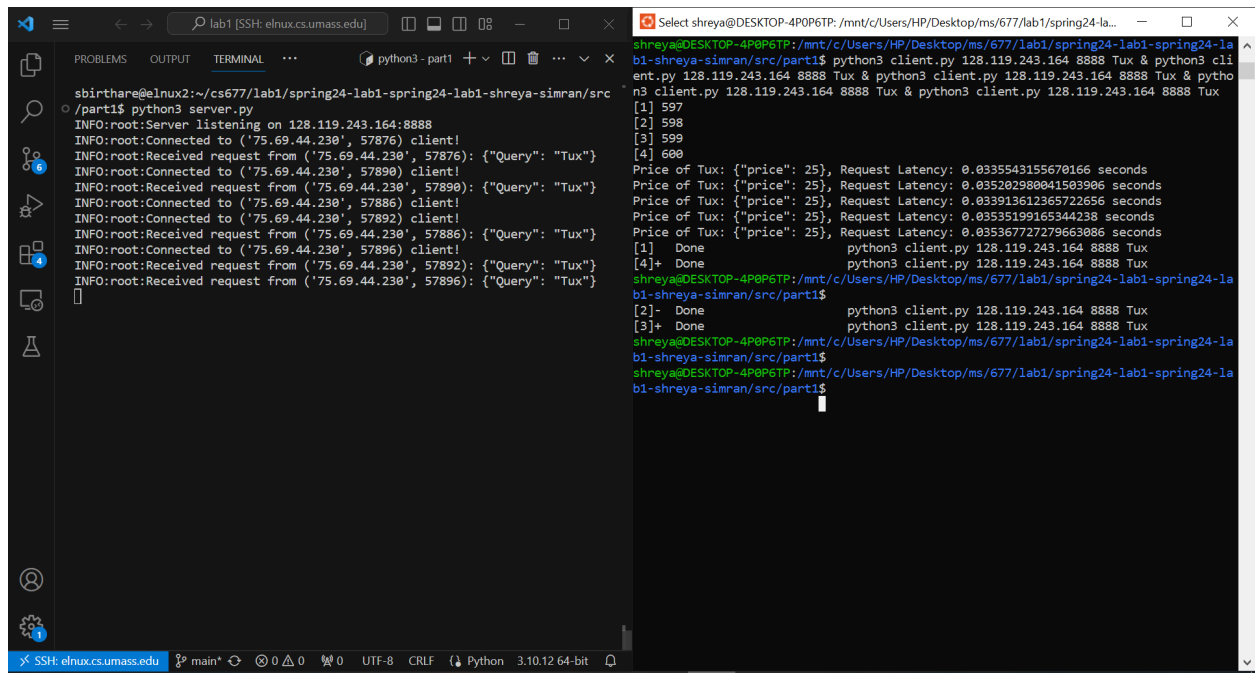
When num of concurrent clients = 4



```
sbirthare@elinux2:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src
/part1$ python3 server.py
INFO:root:Server listening on 128.119.243.164:8888
INFO:root:Connected to ('75.69.44.230', 57884) client!
INFO:root:Received request from ('75.69.44.230', 57894): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57884) client!
INFO:root:Connected to ('75.69.44.230', 57896) client!
INFO:root:Connected to ('75.69.44.230', 57882) client!
INFO:root:Received request from ('75.69.44.230', 57882): {"Query": "Tux"}
INFO:root:Received request from ('75.69.44.230', 57896): {"Query": "Tux"}

shreya@DESKTOP-4P0P6TP:/mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux
[1] 576
[2] 577
[3] 578
Price of Tux: {"price": 25}, Request Latency: 0.04313206672668457 seconds
Price of Tux: {"price": 25}, Request Latency: 0.04318857192993164 seconds
Price of Tux: {"price": 25}, Request Latency: 0.04522085189819336 seconds
Price of Tux: {"price": 25}, Request Latency: 0.05004692077636719 seconds
[1] Done python3 client.py 128.119.243.164 8888 Tux
[2]- Done python3 client.py 128.119.243.164 8888 Tux
[3]+ Done python3 client.py 128.119.243.164 8888 Tux
shreya@DESKTOP-4P0P6TP:/mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
```

When num of concurrent clients = 5



The screenshot shows a VS Code terminal window with two panes. The left pane shows the output of a Python server running on a remote host. The right pane shows the output of multiple client processes running on a local desktop.

**Left Pane (Server Output):**

```
sbirthare@elinux2:~/cs677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src
/part1$ python3 server.py
INFO:root:Server listening on 128.119.243.164:8888
INFO:root:Connected to ('75.69.44.230', 57876) client!
INFO:root:Received request from ('75.69.44.230', 57876): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57890) client!
INFO:root:Received request from ('75.69.44.230', 57890): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57886) client!
INFO:root:Received request from ('75.69.44.230', 57886): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57892) client!
INFO:root:Received request from ('75.69.44.230', 57892): {"Query": "Tux"}
INFO:root:Connected to ('75.69.44.230', 57896) client!
INFO:root:Received request from ('75.69.44.230', 57896): {"Query": "Tux"}
INFO:root:Received request from ('75.69.44.230', 57896): {"Query": "Tux"}

```

**Right Pane (Client Output):**

```
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$ python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux & python3 client.py 128.119.243.164 8888 Tux
[1] 597
[2] 598
[3] 599
[4] 600
Price of Tux: {"price": 25}, Request Latency: 0.0335543155670166 seconds
Price of Tux: {"price": 25}, Request Latency: 0.035202980041503906 seconds
Price of Tux: {"price": 25}, Request Latency: 0.033913612365722656 seconds
Price of Tux: {"price": 25}, Request Latency: 0.03535199165344238 seconds
Price of Tux: {"price": 25}, Request Latency: 0.035367727279663086 seconds
[1] Done
python3 client.py 128.119.243.164 8888 Tux
[4]+ Done
python3 client.py 128.119.243.164 8888 Tux
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
python3 client.py 128.119.243.164 8888 Tux
[2]- Done
python3 client.py 128.119.243.164 8888 Tux
[3]+ Done
python3 client.py 128.119.243.164 8888 Tux
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$
shreya@DESKTOP-4P0P6TP: /mnt/c/Users/HP/Desktop/ms/677/lab1/spring24-lab1-spring24-lab1-shreya-simran/src/part1$

```