

Programming Language Used: Python 3.8.1

Libraries/Frameworks: unittest, threading, socket, queue, subprocess, sys, os, time

How To Run Code:

First run the server by typing `python3 server_python_tcp.py 3300` or `python3 server_python_udp.py 3300` on a terminal command line. 3300 would be the port number, so it could be any number that is a valid port number. The server must be running before the client. Open another terminal window and enter `python3 client_python_tcp.py` or respectively `python3 client_python_udp.py` to run the client.

Several prompts will pop up in the client, here are some examples:

Enter server name or IP address: 127.0.0.1

Enter port: 3300

Enter command: `ls > ls.txt`

The command must be entered with `command > file.txt`

Testing:

Run these commands on terminal window:

`python3 test_server_tcp.py`

`python3 test_client_tcp.py`

`python3 test_server_udp.py`

`python3 test_client_udp.py`

References:

I did not specifically copy code from anywhere; however, I used the links below and the textbook to learn about socket programming and unit testing in Python.

<https://wiki.python.org/moin/TcpCommunication>

<https://www.geeksforgeeks.org/socket-programming-python/>

<https://docs.python.org/3/library/socket.html#socket.socket.setblocking>

<https://www.devdungeon.com/content/unit-testing-tcp-server-client-python>

Textbook: J. Kurose and K. Ross, “*Computer Networking: A Top-Down Approach Featuring the Internet*”, Addison-Wesley, 7th Edition (May 2016). **Pages:** 194-199 & 202-205.