Client Server Socket Programmings

CN CSL317

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Requirements

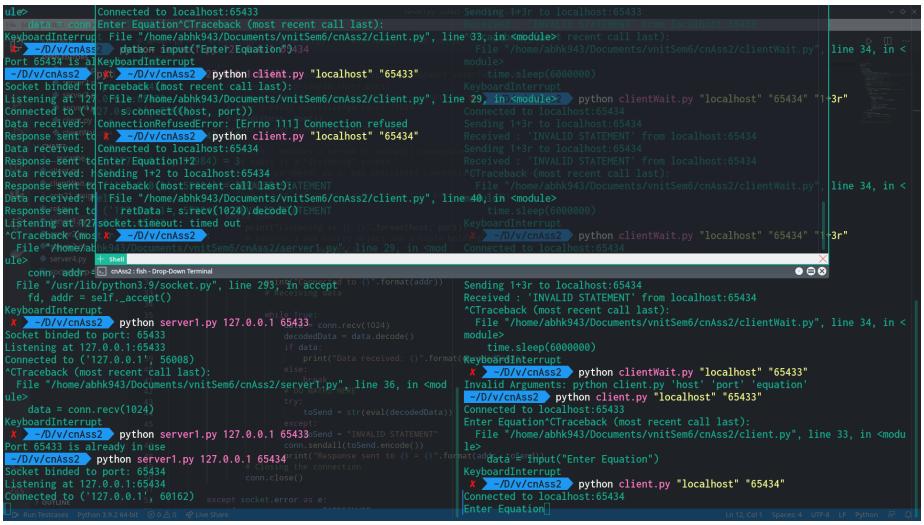
Install python in your environment if not already installed: `pip install python`

How To Run

- Each of the server files can be run using: `python serverx.py "host" "port"`
- Client files can be run using: `python client.py "host" "port"`

Demo

server1.py



Left console: server1.py, Right console: first client Top console: second client, trying to connect.

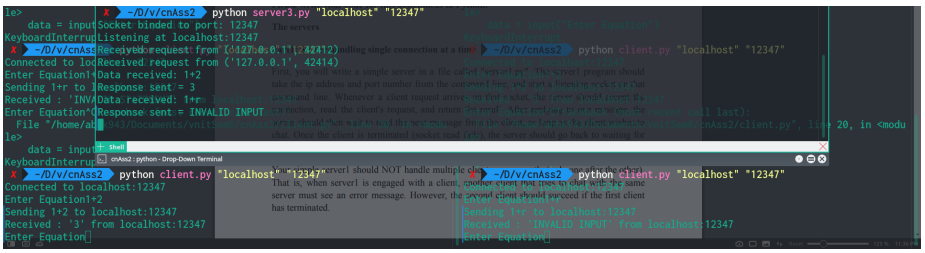
I have used `socket.listen(0)`(doesn't keep pending requests when already having a connection) to implement connection refusal when having a connection already. If that does'nt work, there is timeout provided in client, which wait for 2 seconds and if it doesn't receive any response it terminates. Connection is closed when client closes the connection.

server2.py

Top: server2.py Left: concurrently connected, invalid input Right: concurrently connected, valid input

Each connection spawns it's own thread and engages the client. Connection is closed when client closes the connection.

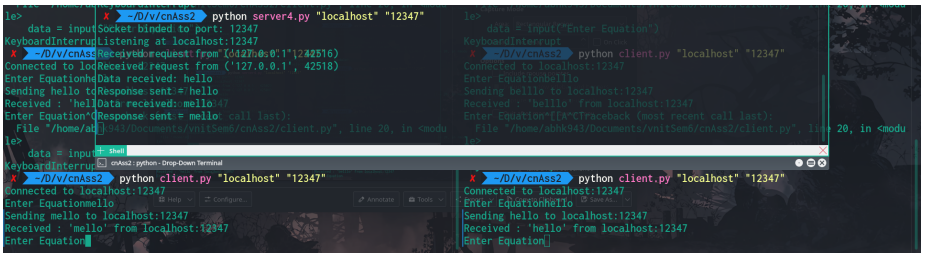
server3.py



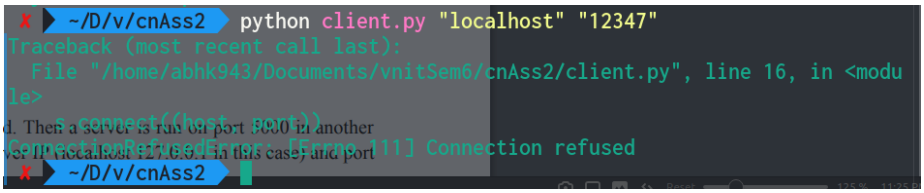
Top: server2.py Left: concurrently connected, valid input Right: concurrently connected, invalid input

- Every socket is added to the buffer including server socket.
- Socket is selected using select function.
  - If socket is server
    - We accept the connection in it and append it to buffer.
  - If socket is client data is taken from the socket
    - If data is present, output is sent,
    - If data is not present then the socket is removed from buffer and connection is closed.

server4.py



Port already occupied



Server not started

Expression evaluation

For evaluating the mathematical expression the string is simply passed to `eval()` function available with python, so the server is capable to solving any type of equation.

Acknowledgement

- https://www.positronx.io/create-socket-server-with-multiple-clients-in-python/
- https://steelkiwi.com/blog/working-tcp-sockets/
- https://yasoob.me/2013/08/06/python-socket-network-programming/
- https://docs.python.org/3/library/socket.html
- https://www.techbeamers.com/python-tutorial-write-multithreaded-python-server/
- https://docs.python.org/3/tutorial/errors.html
- https://docs.python.org/3/library/multiprocessing.html
- https://realpython.com/python-sockets/#echo-client-and-server