Distributed System Lab1

Coding language used: Python
Version: 3.9.7

Code Execution Flow:

1. Client code calls server_a code.
2. In which server_a function on successful socket connection from client invokes conn_b function which list the server_a directory listing and store it in list_a and also
3. Conn_b makes socket connection to server_b code.
4. Server_b is responsible for making directory listing and sending that data to conn_b.
5. In function conn_b from code server_a we concatenate both lists in a single list and send that data to server_a which is still in connection with client and breaks connection from server_b.
6. On receiving a list on client, client sort that list removes unnecessary spaces and prints the final output.

Following things are limitations for executing program:

1. Localhost address is hardcoded.
2. Sometimes it is noted on personal laptop is that even connection closed in the code sockets are not released in that case just use terminal and type following command to close the connection
   "lsof -iTCP -sTCP:LISTEN"
   This should show you the open port pid just kill them with "kill -9 "pid no"

```
[og@Omkars-MacBook-Air ~ % lsof -iTCP -sTCP:LISTEN
COMMAND  PID USER   FD   TYPE             DEVICE SIZE/OFF NODE NAME
Python  4458   og    3u  IPv4 0x34ae6aa0f7fbb3e3      0t0  TCP localhost:31333 (LISTEN)
Python  4459   og    3u  IPv4 0x34ae6aa0e8fabdfb      0t0  TCP localhost:31334 (LISTEN)
[og@Omkars-MacBook-Air ~ % kill -9 4458
[og@Omkars-MacBook-Air ~ % lsof -iTCP -sTCP:LISTEN
COMMAND  PID USER   FD   TYPE             DEVICE SIZE/OFF NODE NAME
Python  4459   og    3u  IPv4 0x34ae6aa0e8fabdfb      0t0  TCP localhost:31334 (LISTEN)
og@Omkars-MacBook-Air ~ %
```

3. You can add or remove any number of files from server_a_directory and server_b_directory in any format.
4. Directory locations are hard coded. (need to change directory location while executing code on different system)
5. This code have "ls -l" command which is runnable on linux systems only.

Procedure to execute code:

1. Execute the server_a code first. ("python3 server_a.py")
2. Then execute server_b code. ("python3 server_b.py")
3. Then execute client code. ("python3 lab_1.py

4. This should give you the result in the command line.

References used:

Referred some part of code from below links:
https://realpython.com/python-sockets/

To be specific:
https://realpython.com/python-sockets/#echo-server
https://realpython.com/python-sockets/#echo-client

https://www.edureka.co/blog/python-list-remove/#del()

Popen-
https://www.tutorialspoint.com/python/os_popen.htm#:~:text=Python%20method%20popen()%20opens,as%20in%20open()%20function

chdir-
https://www.geeksforgeeks.org/chdir-in-c-language-with-examples/

Some basic functions are used by referring official document of python
https://docs.python.org/3/