OCTOBER 2021

"LAB -1 REPORT"

Submitted for the course

Of

DISTRIBUTED SYSTEMS

Under the guidance of

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Submitted by

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IMPLEMENTATION DETAILS

I implement this project into python language and used PyCharm for the Programming.

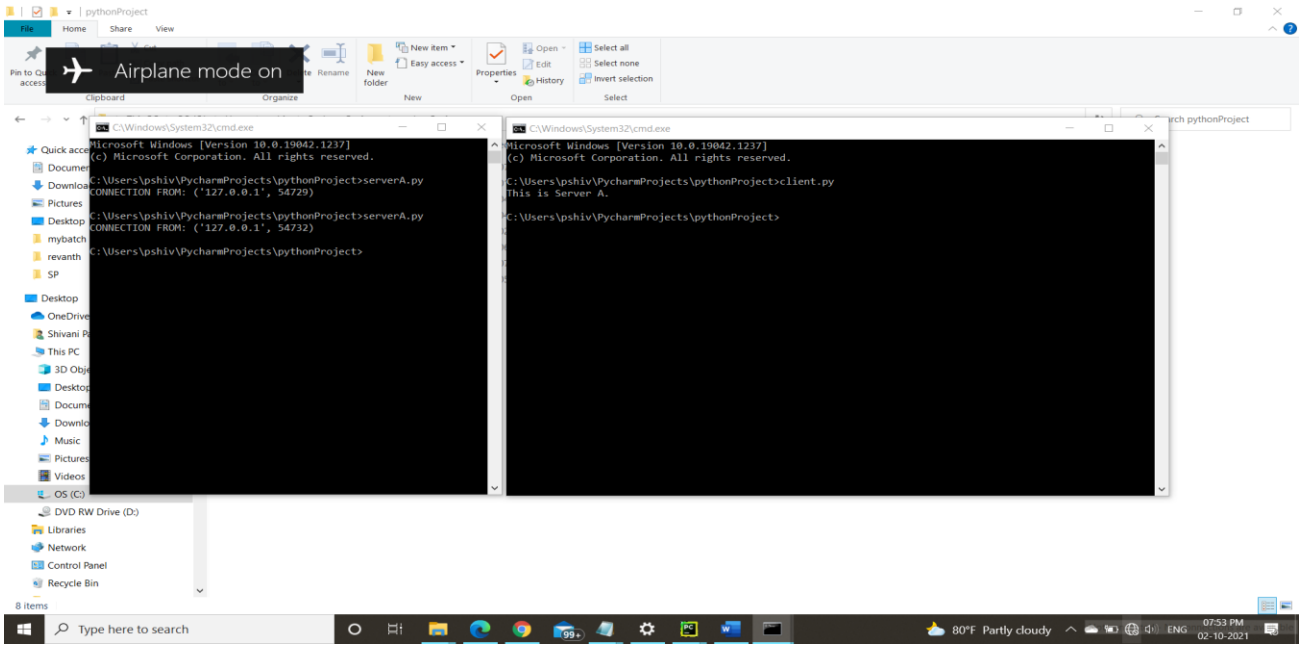
In this project, first I was trying to simple basic establish the connection between client to server. For establish the connection I import the socket and OS module. And then write the server code and client code for as per below from the given reference. https://stackoverflow.com/questions/47539028/transfer-contents-of-a-folder-over-network-by-python

```
# SERVER  CODE
sock = socket()           # Build Socket Object
sock.bind(('', 5000))            # bind the socket with server and port number
sock.listen(2)                  #allow maximum 2 connection to the socket
client, addr = sock.accept()      #wait till a client accept and establish the
connection
print("CONNECTION FROM:", str(addr))   # display client address
```

```
# Client Code
# Make a directory for the received files.
os.makedirs('client',exist_ok=True)

sock = socket()             # Build Socket Object
sock.connect(('localhost',5000))      #bind host address and port together and
connect to the server A
with sock,sock.makefile('rb') as clientfile:
    while True:
        raw = clientfile.readline()     # read the file
        if not raw: break # no more files, server closed connection.
        print(raw.decode())   # print and decode the serverA file
        break     # no more files, server closed connection
```

Then I got the output like this.



Then I write the same client & server code for server B and establish the connection. After, Establish the connection between Server B to Server A to Client, In Server A, I give the path of directory of my folder and list out the files from directory.

```
dir_name = 'C:\\Users\\pshiv\\PycharmProjects\\pythonProject\\MP'    # path of
the folder
arr = os.listdir(dir_name)       # list out the files from directory
```

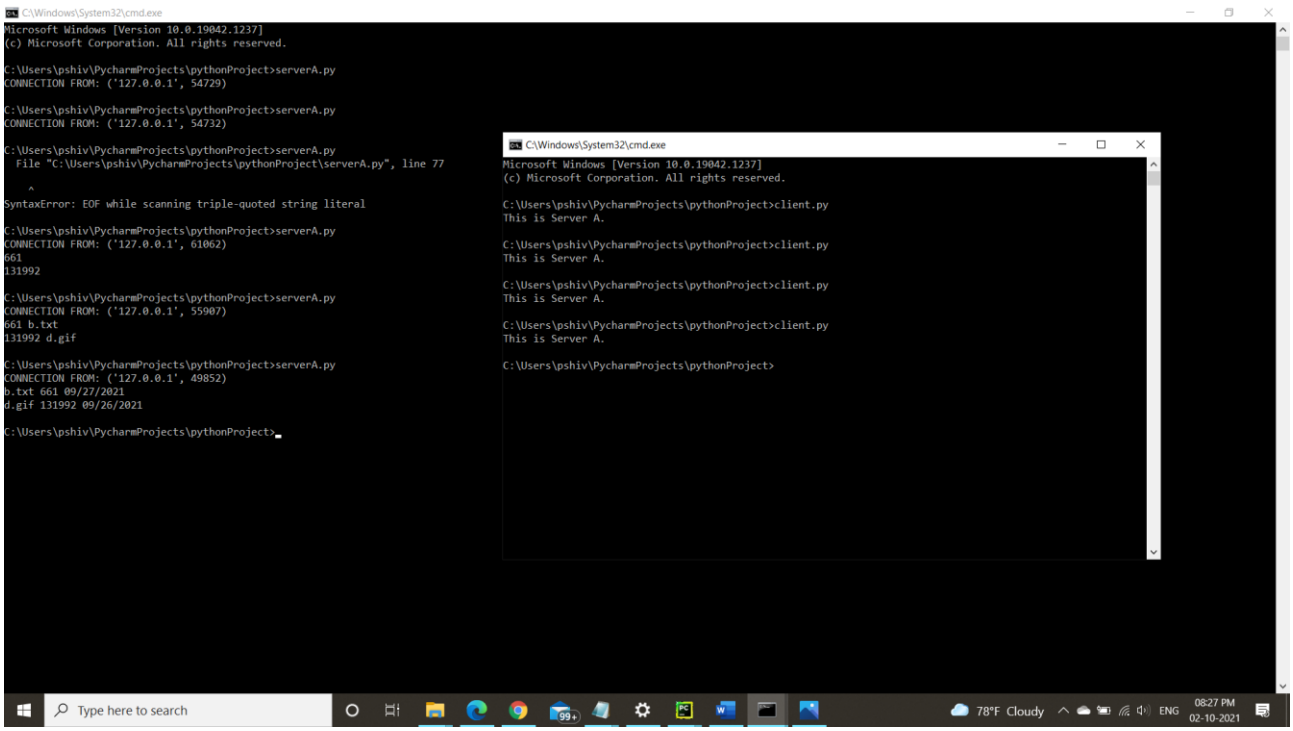
After that I create the for loop and join the file path with directory and display the last modification of date of file from the given reference.
https://thispointer.com/python-get-list-of-files-in-directory-sorted-by-date-and-time/

```
file_path = os.path.join(dir_name, file_name)# join the file path with directory
timestamp_str = time.strftime(  '%m/%d/%Y',      # last modification date of file
                              time.gmtime(os.path.getmtime(file_path)))
```

After that I display the size into byte using os.stat().st_size ae per given reference.
https://stackoverflow.com/questions/40783029/os-stat-st-size-gives-me-incorrect-size-in-python and https://www.journaldev.com/32067/how-to-get-file-size-in-python

```
files_with_size = (os.stat(file_path).st_size)      # Get file Size in bytes
```

In Output, I got Filename, Size, and Date as per below.



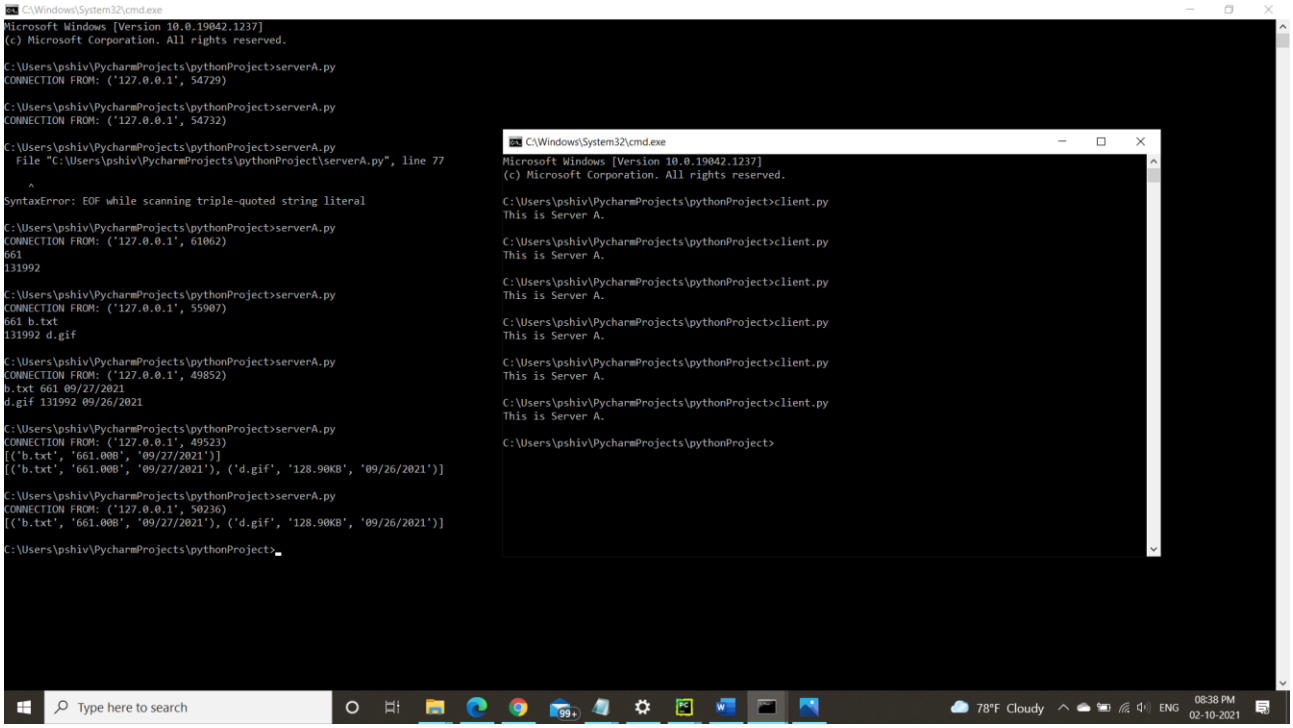
After got the size, I converted that size into Human readable size and convert into ‘KB’, ‘MB’, ‘GB’ etc. using given reference.

https://stackoverflow.com/questions/1094841/get-human-readable-version-of-file-size

```
def human_readable_size(size, decimal_places=2):    # Get human readable version
of file size
    for unit in ['B', 'KB', 'MB', 'GB', 'TB']:
        if size < 1024.0:
            break
        size /= 1024.0
    return f"{size:.{decimal_places}f}{unit}"
human_size = (human_readable_size(files_with_size))
```

After applying above code, I append the data and got the output like this,

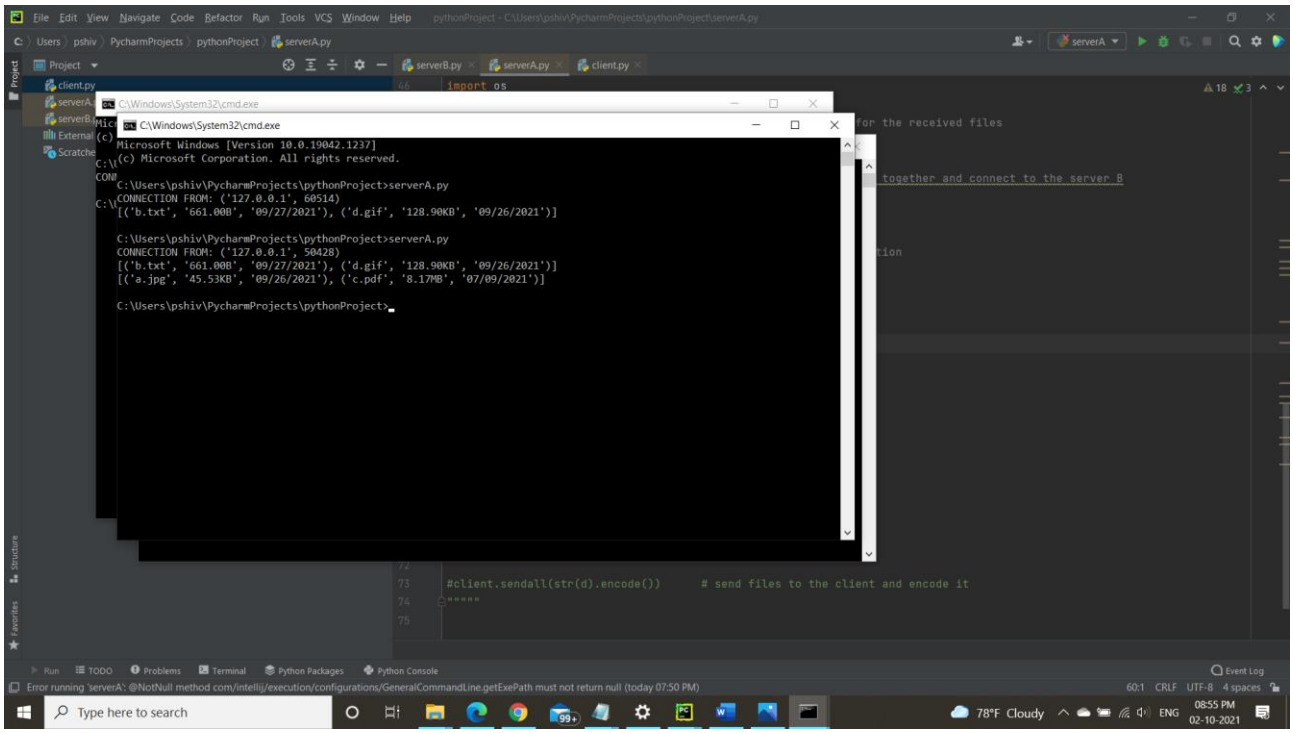
```
data1 = (file_name, human_size, timestamp_str)     # Get filename, human readable
size, date into data
d.append(data1)            # append all three file into d
```



After get the list of files with files metadata then I used same server A code for server B using different directory of folder and also write same client code for server B into the server A file.
After getting server B file I send that server B file to the client and encode it.

```
client.sendall(str(sending).encode())       # send files to the client and encode
it
```

Now, Server A has both server files.



After get the both server files on server A, I append both server files and sort the files by file name.

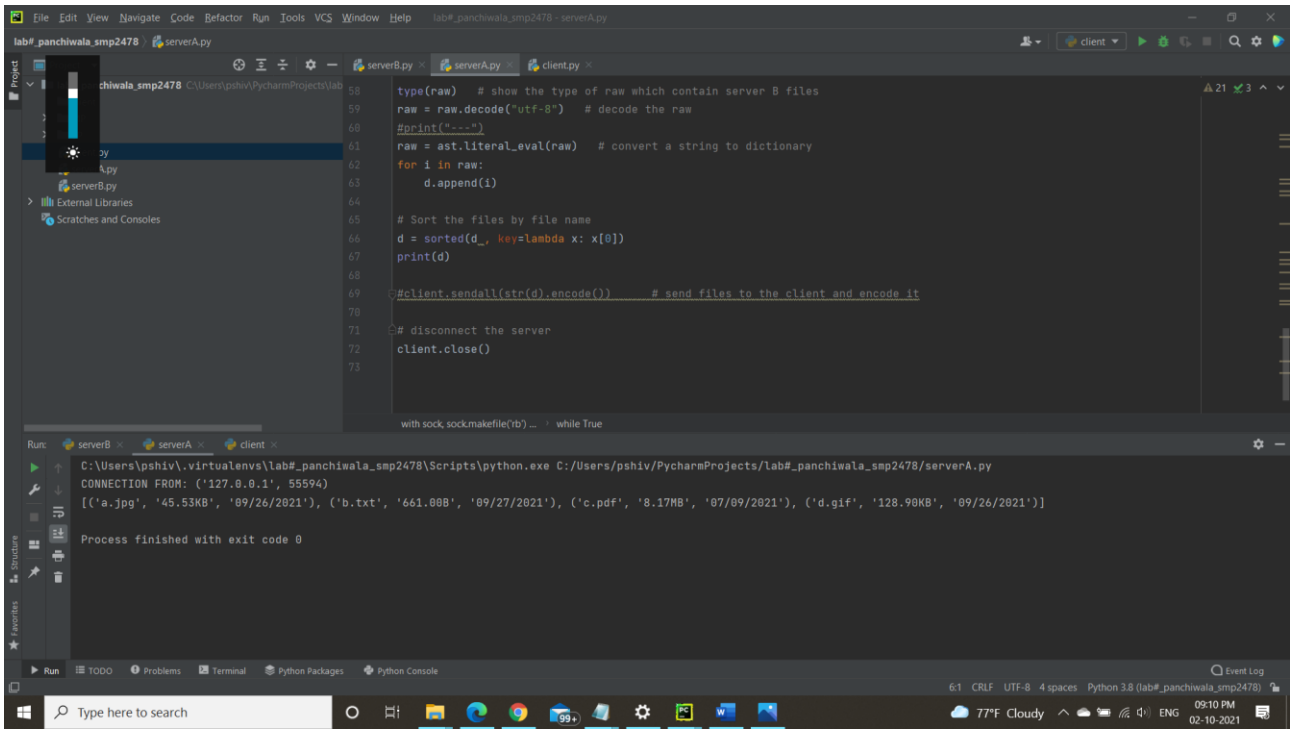
```
# Merge Server A and Server B file


type(raw)    # show the type of raw which contain server B files
raw = raw.decode("utf-8")    # decode the raw
#print("---")
raw = ast.literal_eval(raw)    # convert a string to dictionary
for i in raw:
    d.append(i)

# Sort the files by file name
d = sorted(d , key=lambda x: x[0])
```

For convert a string to dictionary format I used ast.literal_eval() using given reference.
https://www.kite.com/python/docs/ast.literal_eval

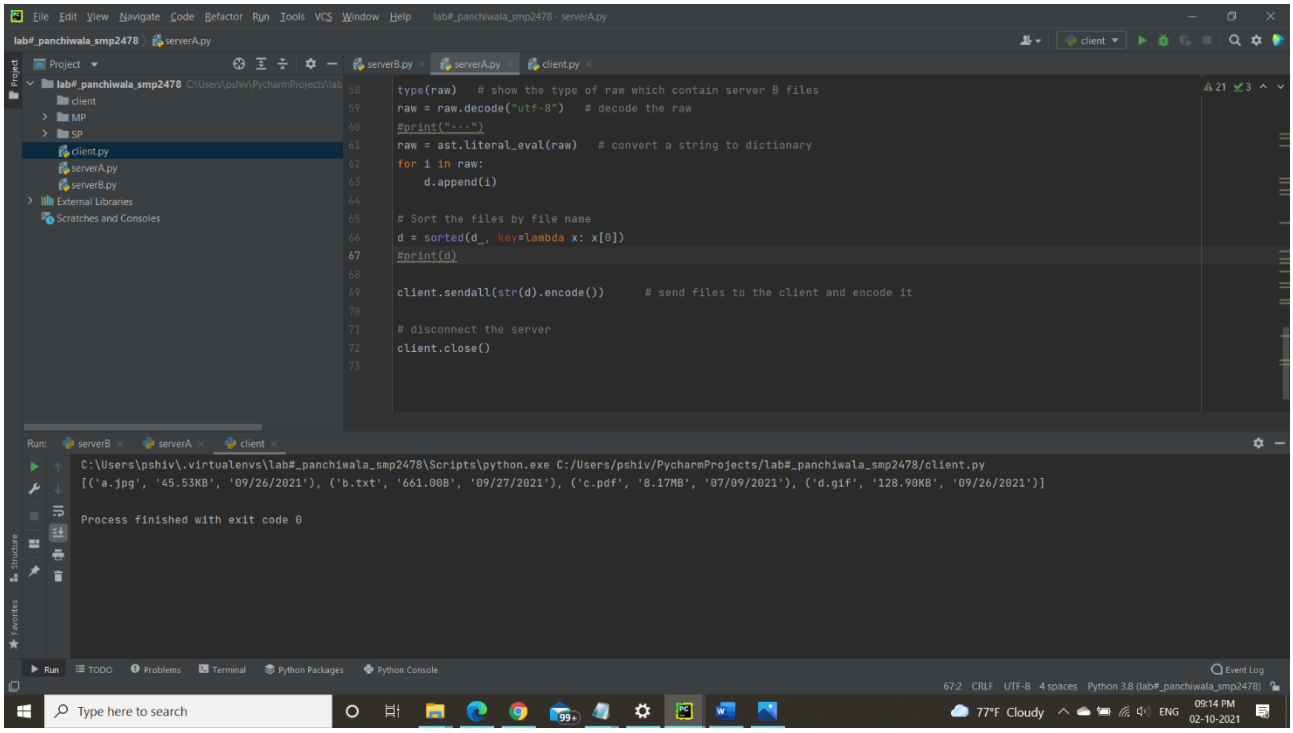
Then I got the output like this



After that I send all the data from Server A to Client and encode it.

```
client.sendall(str(d).encode())       # send files to the client and encode it
```

After sending files from Server A to the client, I got the all the files on Client.



HOW TO IMPLEMENT THE PROJECT

1) Open the Command Prompt and write the **serverB.py**
2) After that open another Command Prompt and write the **serverA.py**
3) And open again another Command Prompt and write **client.py**
4) Then you will get the output on the Client.

REFERENCES

1) https://stackoverflow.com/questions/47539028/transfer-contents-of-a-folder-over-network-by-python
2) https://thispointer.com/python-get-list-of-files-in-directory-sorted-by-date-and-time/
3) https://stackoverflow.com/questions/40783029/os-stat-st-size-gives-me-incorrect-size-in-python
4) https://www.journaldev.com/32067/how-to-get-file-size-in-python
5) https://stackoverflow.com/questions/1094841/get-human-readable-version-of-file-size
6) https://www.kite.com/python/docs/ast.literal_eval