Developed an application for Remote File System(RFS) using sockets for client and server.
The Application supports 5 commands:

1. CWD - retrieve the path of current working directory
2. LS - lists all files and folder in current working directory
3. CD <dir> - changes the directory to <dir> as specified by client
4. DWD <file> - download the <file> from server to client
5. UPD <file> - uploads the <file> from client to remote server

Commands (3-5) throws an exception if they fail due to any runtime error and gives '***status-OK'*** if they execute properly.

The application is developed in three layers:

1. File Service
2. Crypto Service
3. Networking

File Service: This is the topmost layer, uses Crypto service to encrypt and decrypt the data and executes the commands using OS API's. Uses FTP protocol to transfer files and data.

Crypto Service: This layer encrypts and decrypts the data before sending and on receiving respectively. Thus, it protects the original data and makes the connection more secure.
The three types of encryption available in crypto layer are:

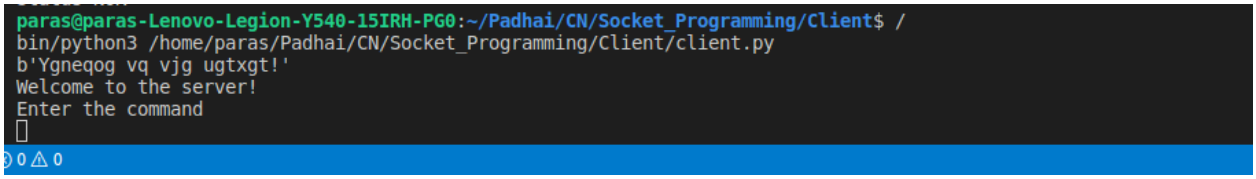
1. Plain text - No change
2. Substitute - Alphanumeric character are substituted with a value decided by fixed offset
3. Transpose - Reverses the data word by word

Makes use of encryption protocols.

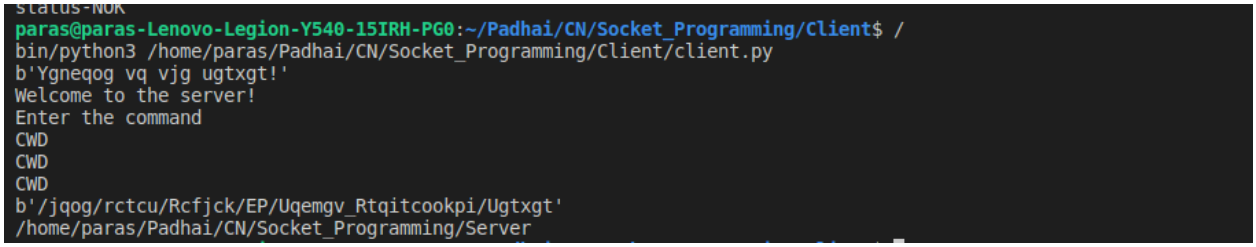
Network Layer: Network layer uses TCP connection to connect once and transfer multiple times without errors and in-sequence arrival of packets. IPv4 is used for the layer.

1. Running server file.

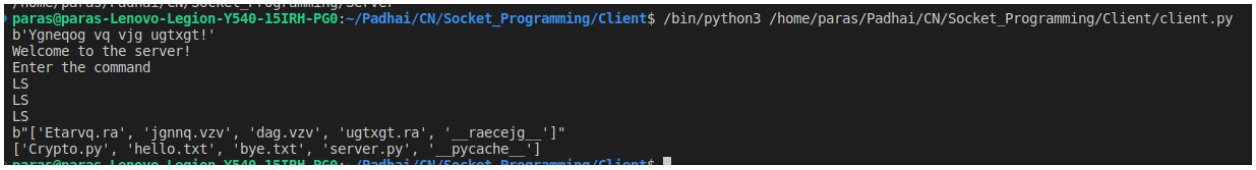
2. Running Client file and successful connection with server



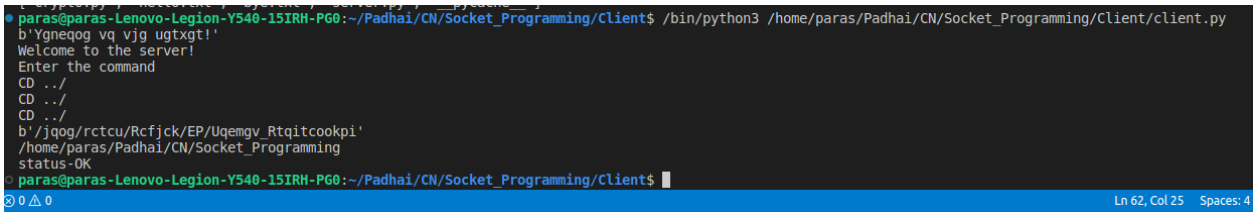
3. Execution of CWD command. Have used a substitute with offset =2 as encryption hence the message is encrypted that way.



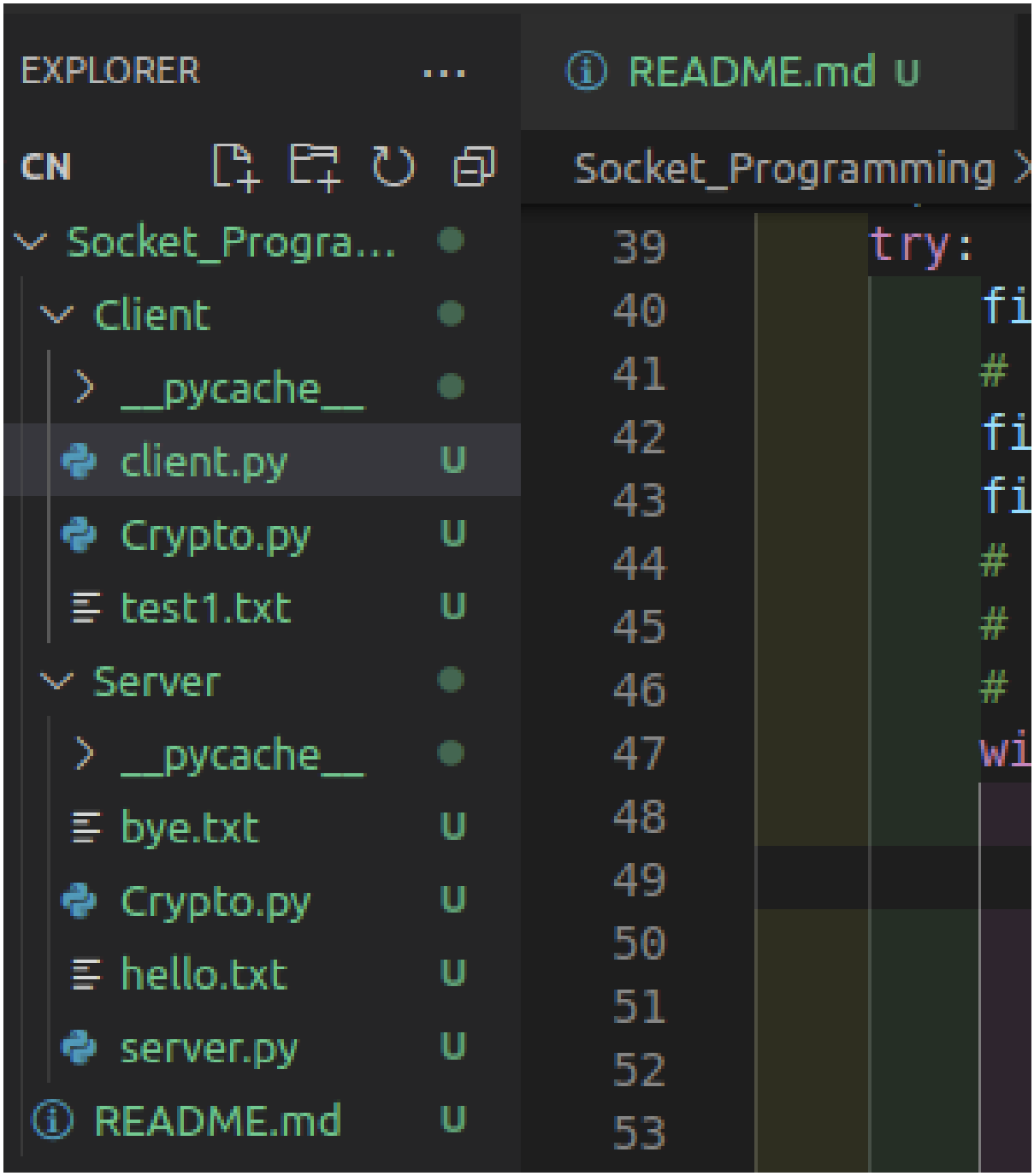
4. Execution of LS command



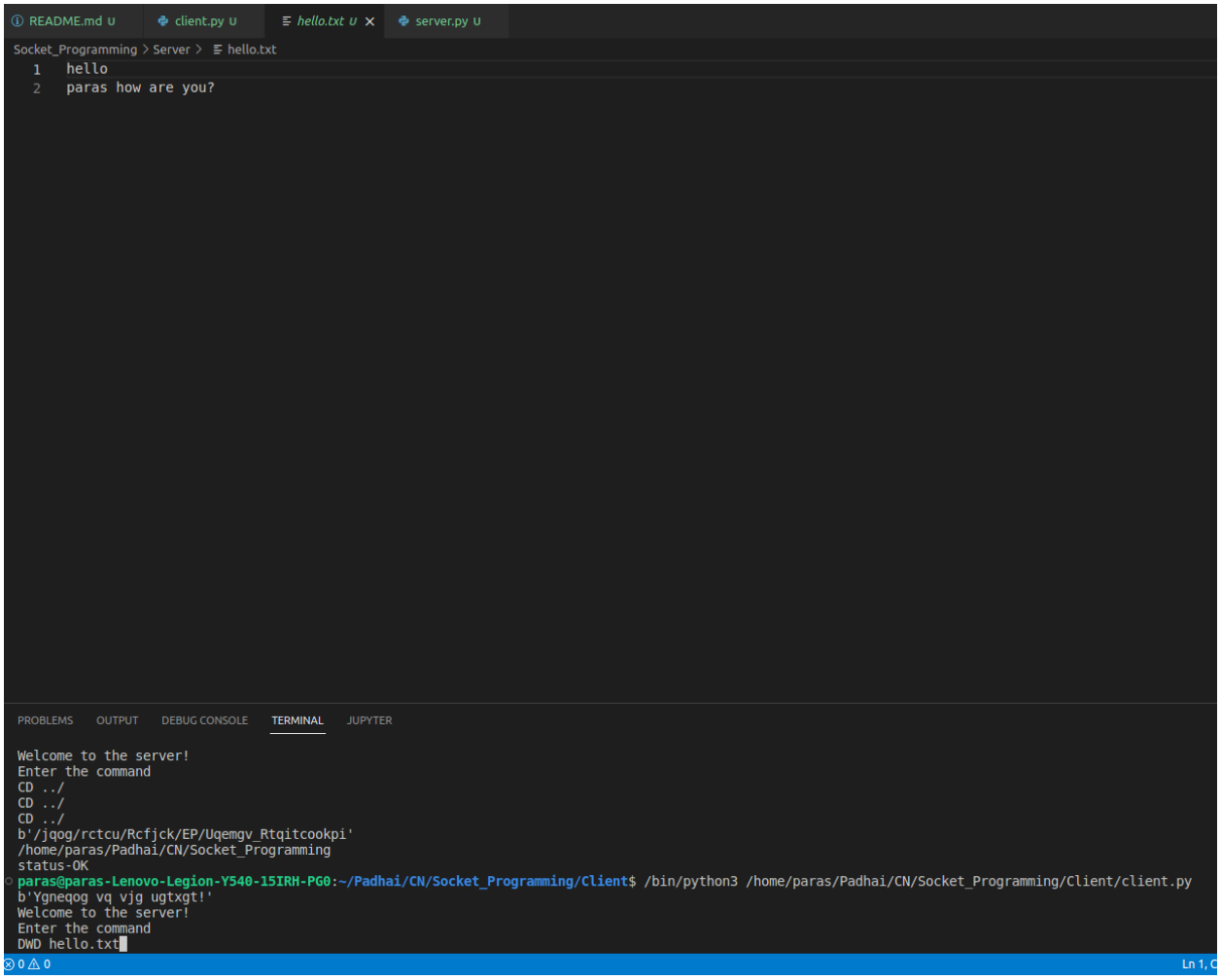
5. Execution of CD <path> command



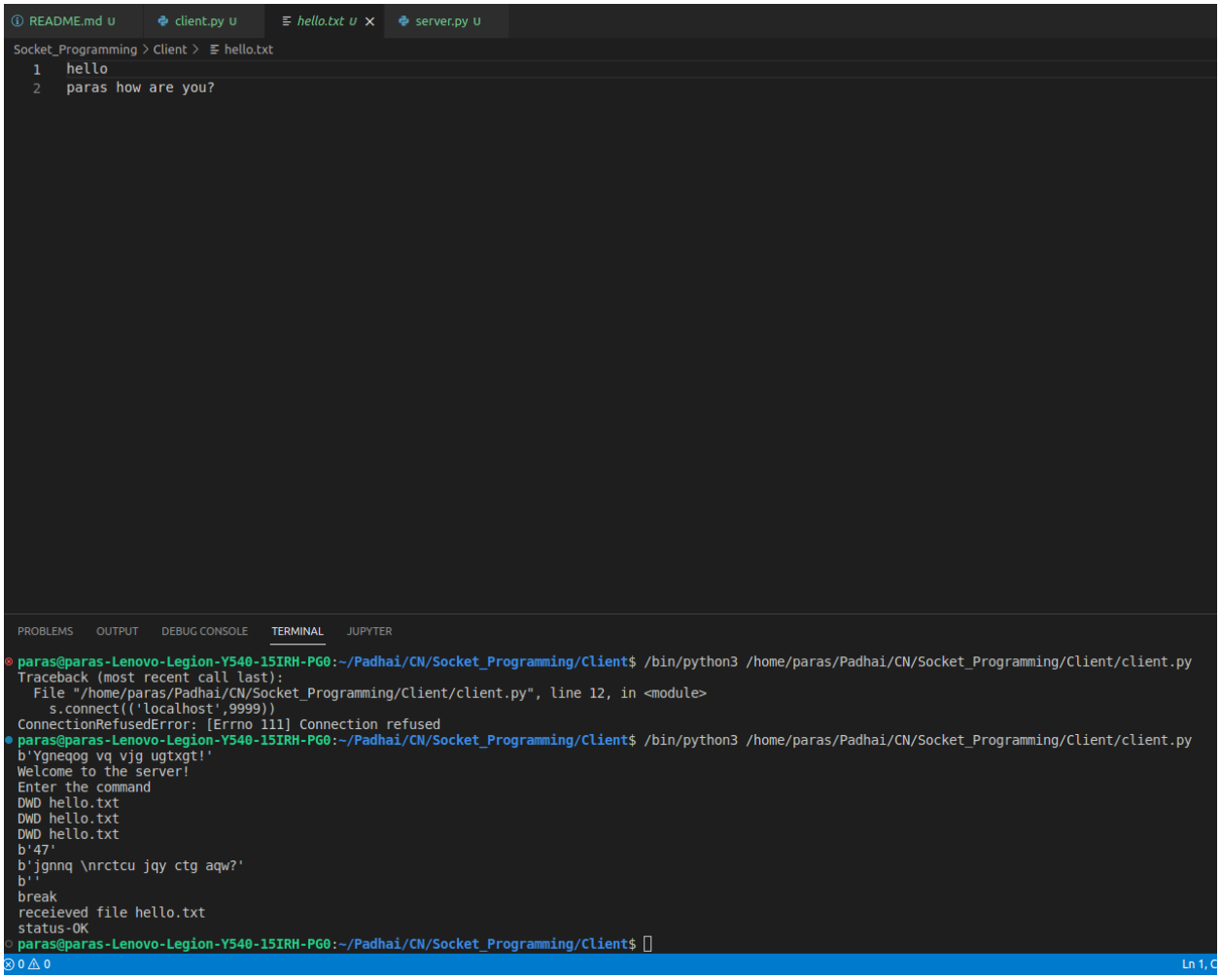
6. File structure before execution of DWD command. Note: hello.txt is not available in Client directory.



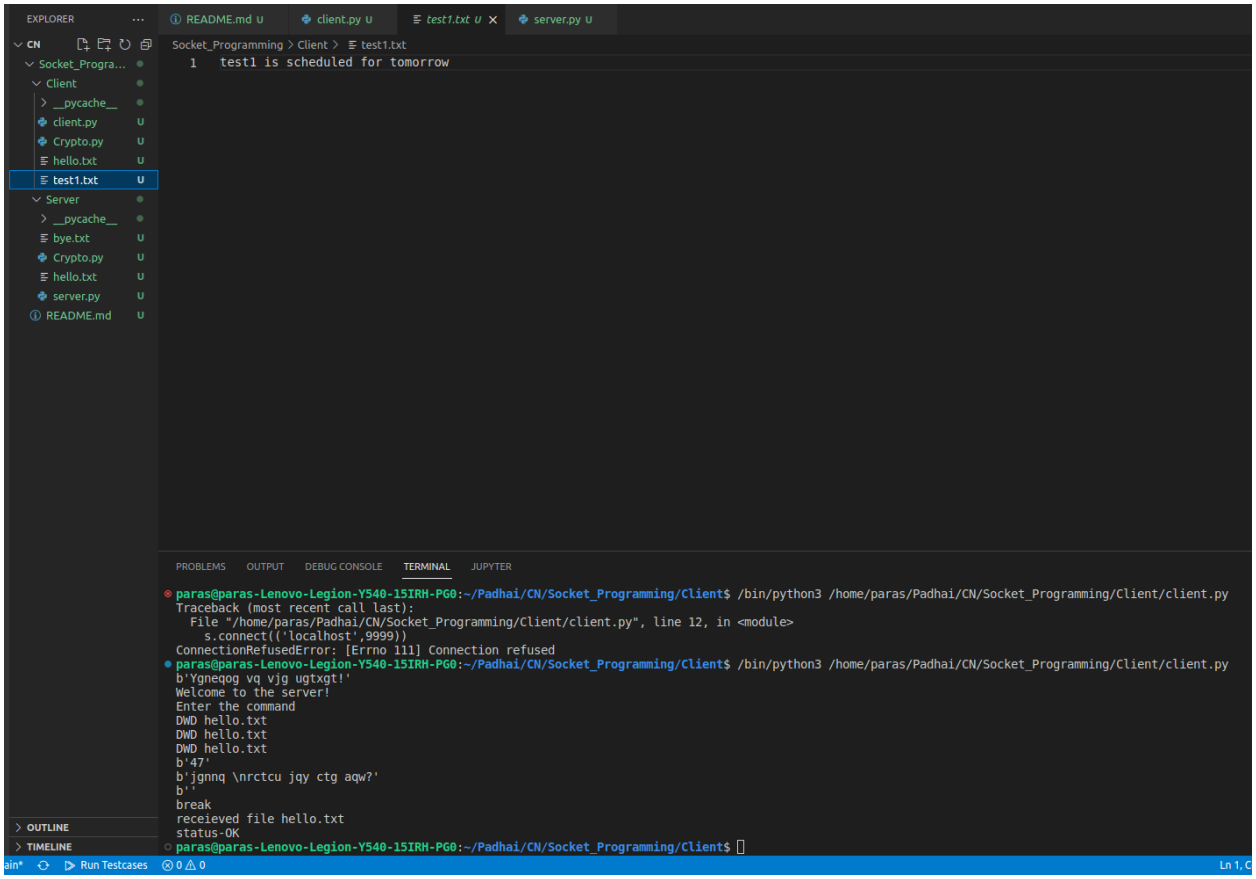
7. Execution of DWD hello.txt



8. We can see that hello.txt file is downloaded in Client directory



9. File tree before execution of UPD test1.txt. Note: test1.txt is not present inside the server directory



10. Result of upload command. We can see the contents of test1.txt uploaded to server direcotry