

COMP7005

Assignment 1:

Simple Client Server

File Transfer

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Introduction

I designed a basic client-server program in Python using the TCP/IP protocol suite.

The client issues a GET or SEND command with a file name to the server and will perform the specified action of either getting a file from the server given the file name or sending a file from client to server to be saved.

The server waits for a client to connect on TCP port 7005 which is used for controlling and be given commands. Once the commands have been registered by the server, the client will then connect to TCP port 7006 on the server which is used for data transfers and will either GET or SEND a file from the server depending on the operation specified.

Both the client and server will send the file in 1024 byte packets to the recipient and then save the file once the data transfer is complete.

Pseudocode

Client

Get ServerIP, operation, sourcefile, destfile in command line

check argv are valid inputs

check if operation is GET or SEND

GET: Connect to server on listen port(7005)

Give server relevant data for their side, operation and sourcefile

Connect to server data port(7006)

Create file to write to on client

Receive 1024byte packets of data from server

Write 1024 bytes to the file on client until no more data from server

close data socket, close listen socket

SEND: Connect to server on listen port(7005)

Give server relevant data for their side, operation and destfile

Connect to server data port(7006)

Open file to read

Send 1024bytes of the file to server until no more to read

close data socket, close listen socket

Server

Create listen and data sockets

listenloop:

wait for client to connect on listen port

receive operation and filepath/destfile depending on GET/SEND

wait for client to connect on data port

check if operation is GET/SEND

GET: Verify if the file to read from exists

Open file to read from (filePath)

send 1024 byte packets of the file to the client until no more to read

close data socket, close listen socket

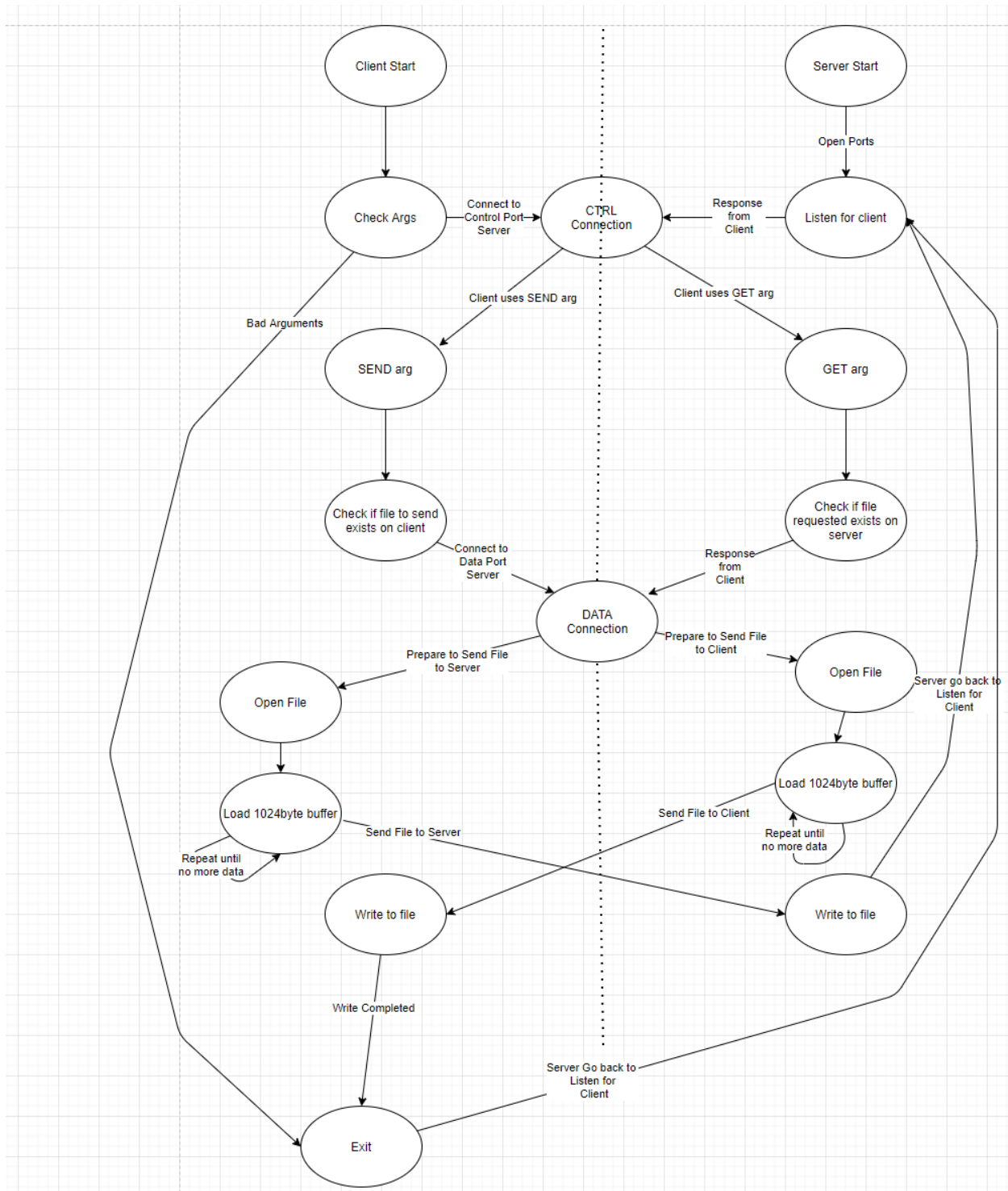
SEND: Create file to write to(destFile)

receive 1024 byte packets from client

write the 1024 bytes to the file until no more packets from client

close data socket, close listen socket

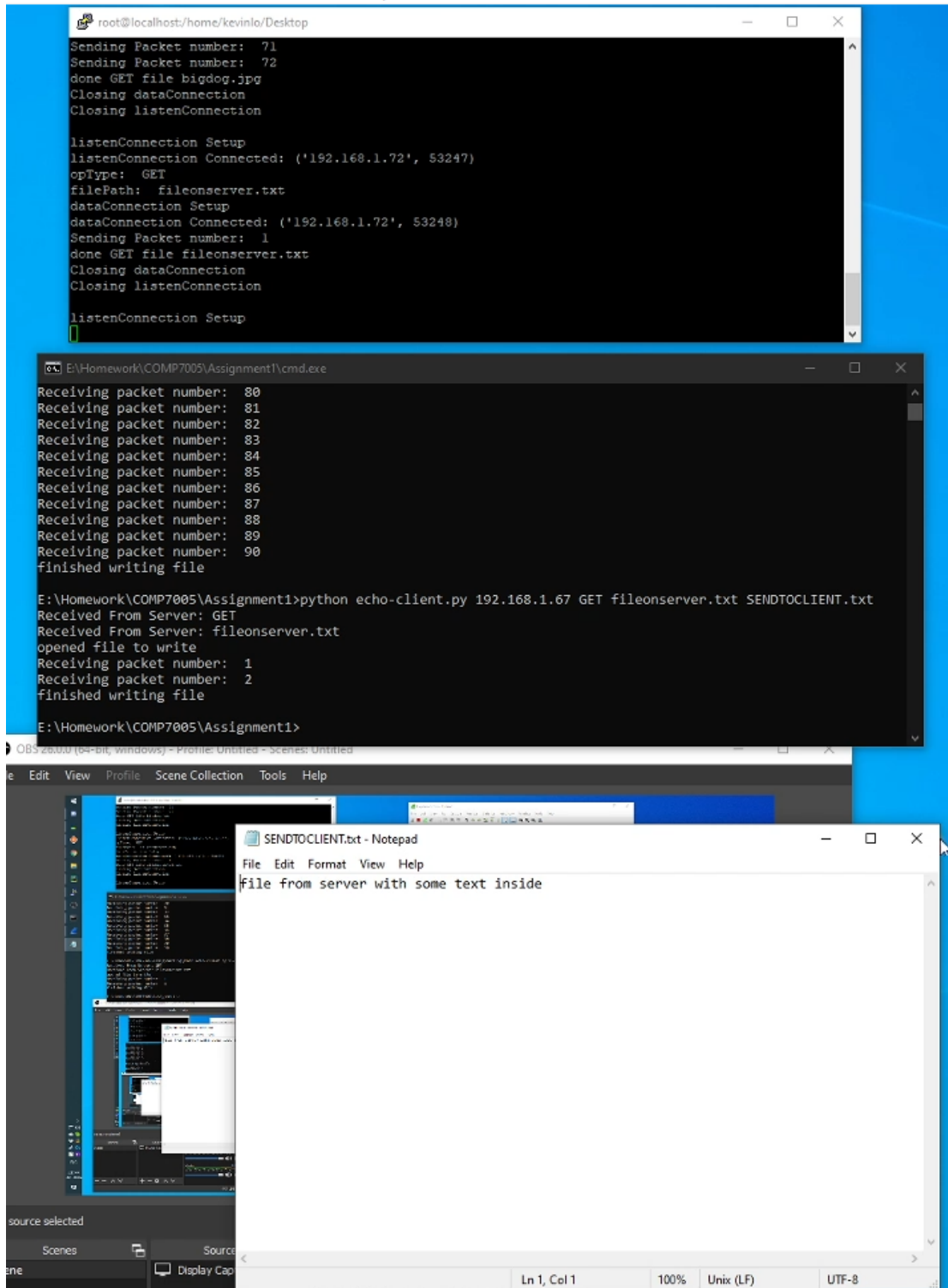
State Diagram



Testing

1. Good GET

The client requests a file called **fileonserver.txt** from the server and saves it as **SENDOCLIENT.txt** successfully.



```
root@localhost/home/kevinlo/Desktop
Sending Packet number: 71
Sending Packet number: 72
done GET file bigdog.jpg
Closing dataConnection
Closing listenConnection

listenConnection Setup
listenConnection Connected: ('192.168.1.72', 53247)
opType: GET
filePath: fileonserver.txt
dataConnection Setup
dataConnection Connected: ('192.168.1.72', 53248)
Sending Packet number: 1
done GET file fileonserver.txt
Closing dataConnection
Closing listenConnection

listenConnection Setup
```

```
E:\Homework\COMP7005\Assignment1\cmd.exe
Receiving packet number: 80
Receiving packet number: 81
Receiving packet number: 82
Receiving packet number: 83
Receiving packet number: 84
Receiving packet number: 85
Receiving packet number: 86
Receiving packet number: 87
Receiving packet number: 88
Receiving packet number: 89
Receiving packet number: 90
finished writing file

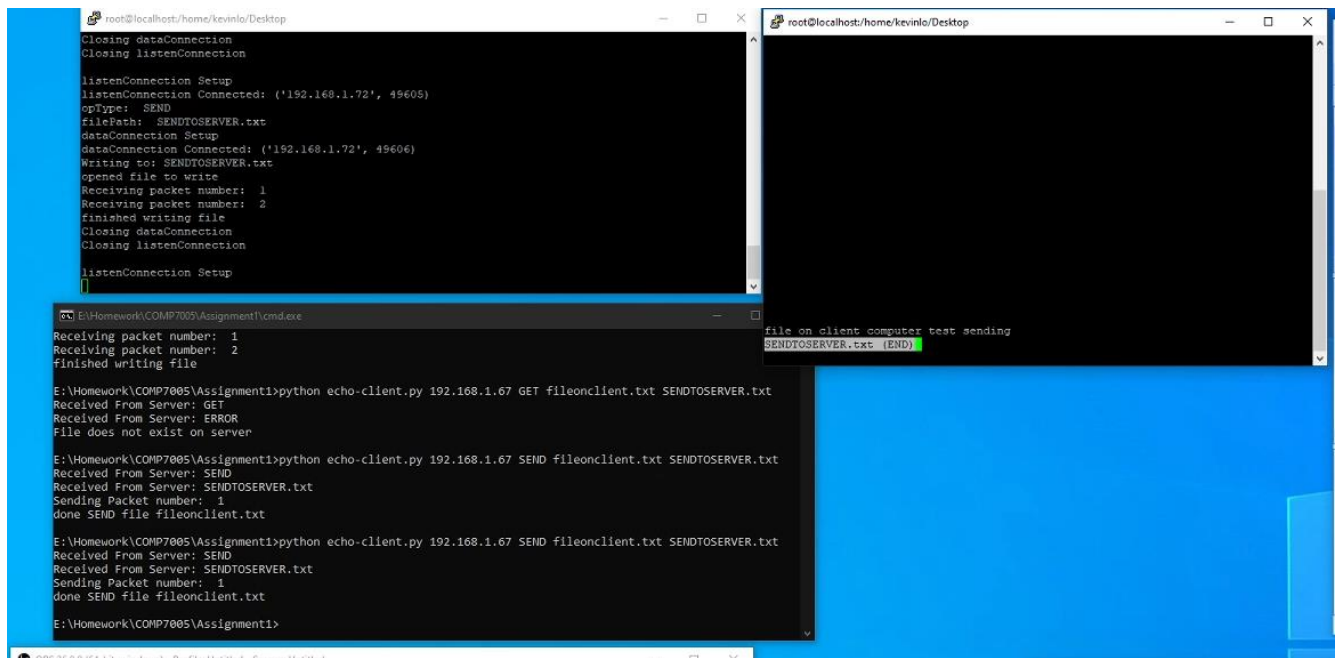
E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET fileonserver.txt SENDTOCLIENT.txt
Received From Server: GET
Received From Server: fileonserver.txt
opened file to write
Receiving packet number: 1
Receiving packet number: 2
finished writing file

E:\Homework\COMP7005\Assignment1>
```

```
SENDTOCLIENT.txt - Notepad
File Edit Format View Help
file from server with some text inside
```

2. Good SEND

The server sends a file called **fileonclient.txt** to the server and saves it as **SENDTOSERVER.txt** successfully.



The screenshot displays three terminal windows from a Windows desktop environment. The top-left window shows the server's log, the top-right window shows the client's log, and the bottom window shows the command prompt where the client is being executed.

Server Log (Top Left):

```
root@localhost/home/kevinlo/Desktop
Closing dataConnection
Closing listenConnection
listenConnection Setup
listenConnection Connected: ('192.168.1.72', 49605)
opType: SEND
filePath: SENDTOSERVER.txt
dataConnection Setup
dataConnection Connected: ('192.168.1.72', 49606)
Writing to: SENDTOSERVER.txt
opened file to write
Receiving packet number: 1
Receiving packet number: 2
finished writing file
Closing dataConnection
Closing listenConnection
listenConnection Setup
```

Client Log (Top Right):

```
file on client computer test sending
SENDTOSERVER.txt (END)
```

Command Prompt (Bottom):

```
E:\Homework\COMP7005\Assignment1\cmd.exe
Receiving packet number: 1
Receiving packet number: 2
finished writing file

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET fileonclient.txt SENDTOSERVER.txt
Received From Server: GET
Received From Server: ERROR
File does not exist on server

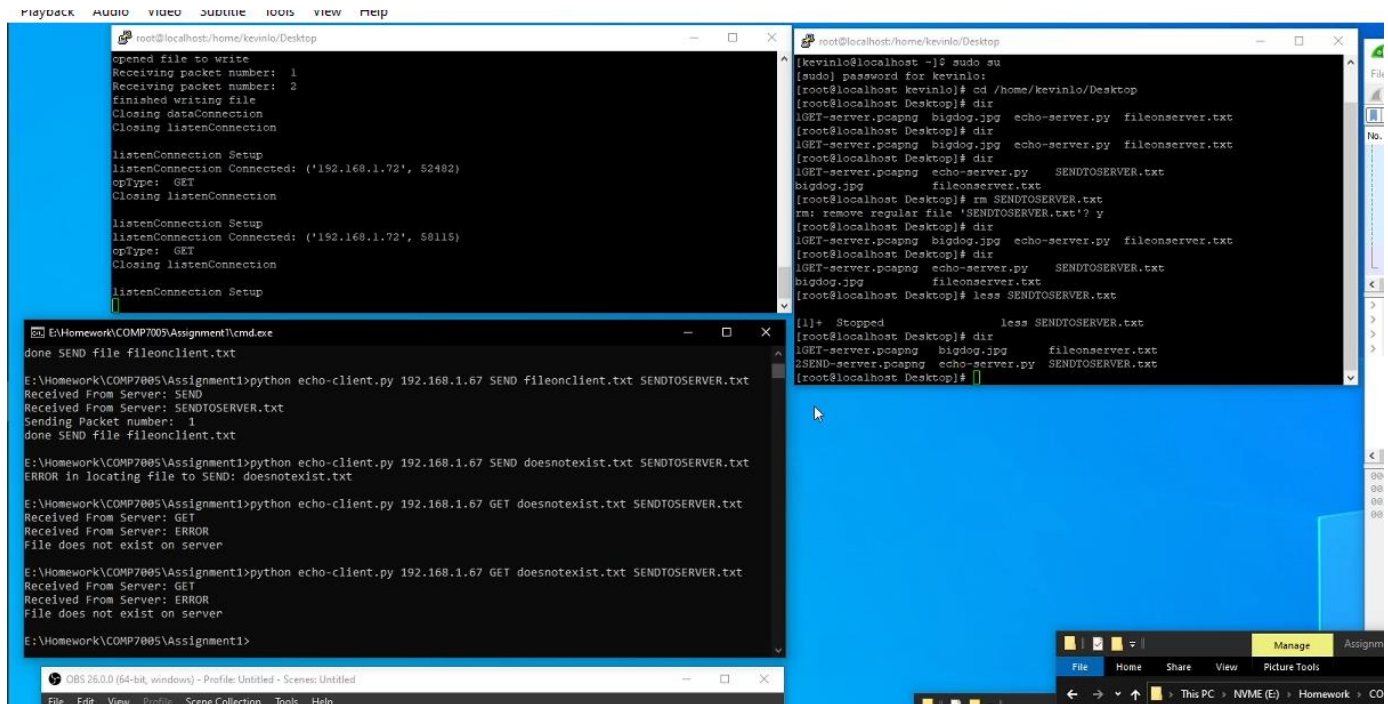
E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND fileonclient.txt SENDTOSERVER.txt
Received From Server: SEND
Received From Server: SENDTOSERVER.txt
Sending Packet number: 1
done SEND file fileonclient.txt

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND fileonclient.txt SENDTOSERVER.txt
Received From Server: SEND
Received From Server: SENDTOSERVER.txt
Sending Packet number: 1
done SEND file fileonclient.txt

E:\Homework\COMP7005\Assignment1>
```

3. Bad GET

The client requests a file called **doesnotexist.txt** that does not exist on the server. Server checks if file exists and sends an error message back to the client and the client will display a "File does not exist on server"



```
root@localhost/home/kevinlo/Desktop
opened file to write
Receiving packet number: 1
Receiving packet number: 2
finished writing file
Closing dataConnection
Closing listenConnection

listenConnection Setup
listenConnection Connected: ('192.168.1.72', 52482)
opType: GET
Closing listenConnection

listenConnection Setup
listenConnection Connected: ('192.168.1.72', 50115)
opType: GET
Closing listenConnection

listenConnection Setup

E:\Homework\COMP7005\Assignment1\cmd.exe
done SEND file fileonclient.txt

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND fileonclient.txt SENDTOSEVER.txt
Received From Server: SEND
Received From Server: SENDTOSEVER.txt
Sending Packet number: 1
done SEND file fileonclient.txt

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND doesnotexist.txt SENDTOSEVER.txt
ERROR in locating file to SEND: doesnotexist.txt

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET doesnotexist.txt SENDTOSEVER.txt
Received From Server: GET
Received From Server: ERROR
File does not exist on server

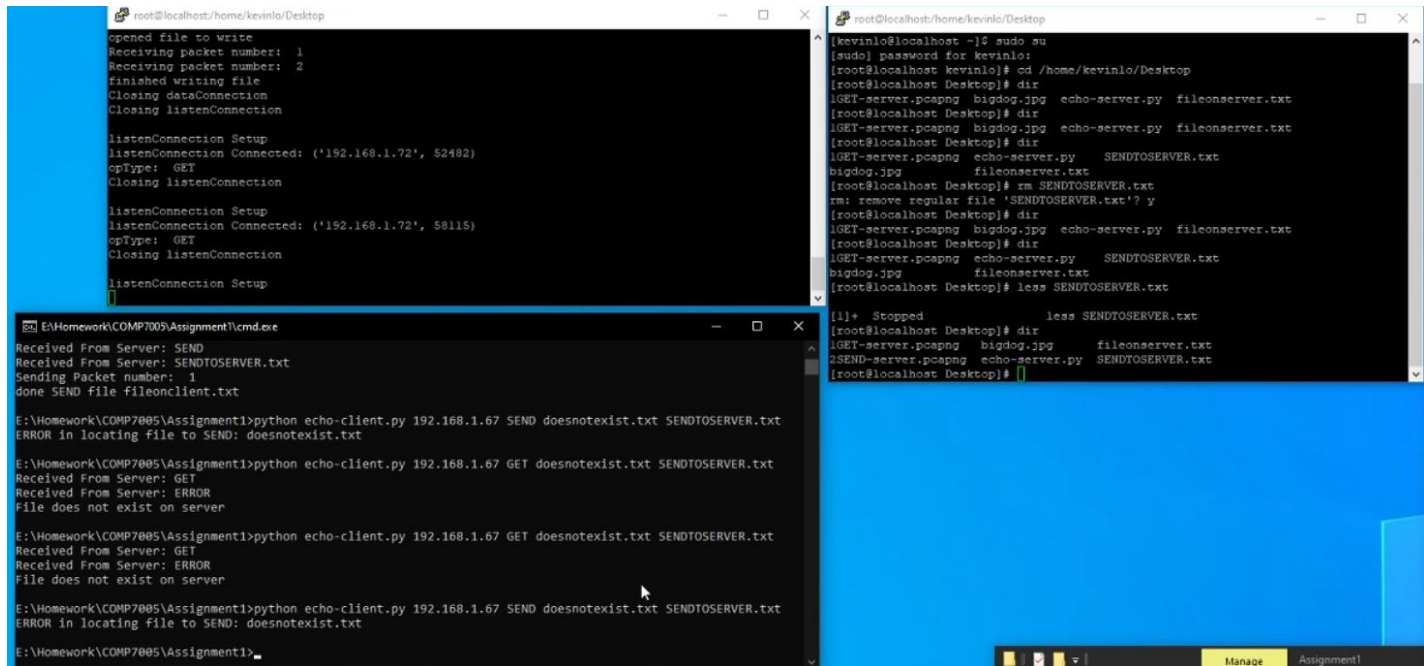
E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET doesnotexist.txt SENDTOSEVER.txt
Received From Server: GET
Received From Server: ERROR
File does not exist on server

E:\Homework\COMP7005\Assignment1>

[kevinlo@localhost ~]$ sudo su
[sudo] password for kevinlo:
[root@localhost kevinlo]# cd /home/kevinlo/Desktop
[root@localhost Desktop]# dir
1GET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
[root@localhost Desktop]# dir
1GET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
1GET-server.pcapng echo-server.py SENDTOSEVER.txt
bigdog.jpg fileonserver.txt
[root@localhost Desktop]# rm SENDTOSEVER.txt
rm: remove regular file 'SENDTOSEVER.txt'? y
[root@localhost Desktop]# dir
1GET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
[root@localhost Desktop]# dir
1GET-server.pcapng echo-server.py SENDTOSEVER.txt
bigdog.jpg fileonserver.txt
[root@localhost Desktop]# less SENDTOSEVER.txt
[!]+ Stopped less SENDTOSEVER.txt
[root@localhost Desktop]# dir
1GET-server.pcapng bigdog.jpg fileonserver.txt
2SEND-server.pcapng echo-server.py SENDTOSEVER.txt
[root@localhost Desktop]#
```


4. Bad SEND

The client tries to send a file that does not exist on their computer. The code in the client will catch that the file does not exist on the client computer and will stop the program before it tries to connect to the server.



```
root@localhost:/home/kevinlo/Desktop
opened file to write
Receiving packet number: 1
Receiving packet number: 2
finished writing file
Closing dataConnection
Closing listenConnection

listenConnection Setup
listenConnection Connected: ('192.168.1.72', 52482)
opType: GET
Closing listenConnection

listenConnection Setup
listenConnection Connected: ('192.168.1.72', 58115)
opType: GET
Closing listenConnection

listenConnection Setup

[kevinlo@localhost ~]$ sudo su
[sudo] password for kevinlo:
[root@localhost kevinlo]# cd /home/kevinlo/Desktop
[root@localhost Desktop]# dir
lsGET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
lsGET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
lsGET-server.pcapng echo-server.py SENDTOSEVER.txt
bigdog.jpg fileonserver.txt
[root@localhost Desktop]# rm SENDTOSEVER.txt
rm: remove regular file 'SENDTOSEVER.txt'? y
[root@localhost Desktop]# dir
lsGET-server.pcapng bigdog.jpg echo-server.py fileonserver.txt
lsGET-server.pcapng bigdog.jpg echo-server.py SENDTOSEVER.txt
bigdog.jpg fileonserver.txt
[root@localhost Desktop]# less SENDTOSEVER.txt
[!]+ Stopped less SENDTOSEVER.txt
[root@localhost Desktop]# dir
lsGET-server.pcapng bigdog.jpg fileonserver.txt
lsSEND-server.pcapng echo-server.py SENDTOSEVER.txt
[root@localhost Desktop]#
```

```
E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND doesnotexist.txt SENDTOSEVER.txt
ERROR in locating file to SEND: doesnotexist.txt

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET doesnotexist.txt SENDTOSEVER.txt
Received From Server: GET
Received From Server: ERROR
File does not exist on server

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 GET doesnotexist.txt SENDTOSEVER.txt
Received From Server: GET
Received From Server: ERROR
File does not exist on server

E:\Homework\COMP7005\Assignment1>python echo-client.py 192.168.1.67 SEND doesnotexist.txt SENDTOSEVER.txt
ERROR in locating file to SEND: doesnotexist.txt

E:\Homework\COMP7005\Assignment1>
```

