

# Computer Networks

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## 1) SERVER :

```
import socket

import threading

IP = socket.gethostbyname(socket.gethostname())

PORT = 8888

ADDR = (IP, PORT)

DISCONNECT_MSG = "!DISCONNECT"

CONNECTION_MSG = "[ SUCCESSFULLY CONNECTED ]"

FORMAT = "utf-8"

SIZE = 1024

INPUT_TIMER = 5

def start_server():

    server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

    server.bind(ADDR)

    server.listen(1)

    print(f"[ SERVER IS LISTENING ON {ADDR} ]")

    while True:

        new_con, addr = server.accept()

        thread = threading.Thread(target=handle_clients, args=(new_con, addr))

        thread.start()

        print(f"[ ACTIVE CONNECTIONS : {threading.active_count() - 1} ]")

def handle_clients(new_con, addr):

    print(f"[ NEW CONNECTION {addr} ]")

    new_con.send(f"{CONNECTION_MSG}".encode(FORMAT))

    connection = True

    while connection:
```

```

msg = new_con.recv(SIZE).decode(FORMAT)

new_con.send(f"[ SERVER : MSG RECIEVED ] : {msg}".encode(FORMAT))


if msg == DISCONNECT_MSG:
    connection = False
else :
    print(f"[ {addr} ] {msg}")
    server_input = input("> ")
    new_con.send(f"[ SERVER ] : {server_input}".encode(FORMAT))

new_con.close()

print(f"[ {addr} ] SUCCESSFULLY DISCONNECTED ")

start_server()

```

## 2) CLIENT :

```

import socket
import threading

IP = socket.gethostbyname(socket.gethostname())
PORT = 8888
ADDR = (IP , PORT)
FORMAT = 'utf-8'
SIZE = 1024
DISCONNECT_MSG = "!DISCONNECT"

client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
client.connect(ADDR)

connection = True
msg = client.recv(SIZE).decode(FORMAT)
print(f"[ SERVER ] : {msg}")

while connection:
    client_input = input("> ")
    client.send(client_input.encode(FORMAT))
    server_msg = client.recv(SIZE).decode(FORMAT)
    print(server_msg)

    if client_input == DISCONNECT_MSG:
        connection = False
    else :
        msg = client.recv(SIZE).decode(FORMAT)
        print(f"[ SERVER ] : {msg}")

```

➤ **2 Clients are connected to the server**

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/server.py"
[ SERVER IS LISTENING ON ('172.17.2.165', 8888) ]
[ NEW CONNECTION ('172.17.2.165', 50569) ]
[ ACTIVE CONNECTIONS : 1 ]
[ NEW CONNECTION ('172.17.2.165', 50572) ]
[ ACTIVE CONNECTIONS : 2 ]
```

➤ **Client 1 sends message to the server and server replies back to client 1**

**Server side :** Server replies back to client 1 after receiving message from client 1. The reply from the server reaches client 1 only.

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/server.py"
[ SERVER IS LISTENING ON ('172.17.2.165', 8888) ]
[ NEW CONNECTION ('172.17.2.165', 50569) ]
[ ACTIVE CONNECTIONS : 1 ]
[ NEW CONNECTION ('172.17.2.165', 50572) ]
[ ACTIVE CONNECTIONS : 2 ]
[ ('172.17.2.165', 50569) ] I'm Client 1
> Confirm Client 1
```

**Client 1 side :**

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/client.py"
[ SERVER ] : [ SUCCESSFULLY CONNECTED ]
> I'm Client 1
[ SERVER : MSG RECIEVED ] : I'm Client 1
[ SERVER ] : [ SERVER ] : Confirm Client 1
>
```

➤ **Client 2 sends message to the server and server replies back to client 2**

**Server side :** Server replies back to client 2 after receiving message from client 2. The reply from the server reaches client 2 only.

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/server.py"
[ SERVER IS LISTENING ON ('172.17.2.165', 8888) ]
[ NEW CONNECTION ('172.17.2.165', 50569) ]
[ ACTIVE CONNECTIONS : 1 ]
[ NEW CONNECTION ('172.17.2.165', 50572) ]
[ ACTIVE CONNECTIONS : 2 ]
[ ('172.17.2.165', 50569) ] I'm Client 1
> Confirm Client 1
[ ('172.17.2.165', 50572) ] I'm Client 2.
> Confirm Client 2.
```

### Client 2 side :

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/client.py"
[ SERVER ] : [ SUCCESSFULLY CONNECTED ]
> I'm Client 2.
[ SERVER : MSG RECIEVED ] : I'm Client 2.
[ SERVER ] : [ SERVER ] : Confirm Client 2.
> █
```

### ➤ Client 2 wants to disconnect

### Client 2 side :

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/client.py"
[ SERVER ] : [ SUCCESSFULLY CONNECTED ]
> I'm Client 2.
[ SERVER : MSG RECIEVED ] : I'm Client 2.
[ SERVER ] : [ SERVER ] : Confirm Client 2.
> !DISCONNECT
[ SERVER : MSG RECIEVED ] : !DISCONNECT
PS C:\Users\B Uday Kiran\CN> █
```

### Server side :

```
PS C:\Users\B Uday Kiran\CN> & "C:/Users/B Uday Kiran/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/B Uday Kiran/CN/Lab3/server.py"
[ SERVER IS LISTENING ON ('172.17.2.165', 8888) ]
[ NEW CONNECTION ('172.17.2.165', 50569) ]
[ ACTIVE CONNECTIONS : 1 ]
[ NEW CONNECTION ('172.17.2.165', 50572) ]
[ ACTIVE CONNECTIONS : 2 ]
[ ('172.17.2.165', 50569) ] I'm Client 1
> Confirm Client 1
[ ('172.17.2.165', 50572) ] I'm Client 2.
> Confirm Client 2.
[ ('172.17.2.165', 50572) SUCCESSFULLY DISCONNECTED ]
█
```