

### SERVER Code:

```
import socket
import threading
import random

HEADER = 64
PORT = 5050
SERVER = socket.gethostbyname(socket.gethostname())
NAME = socket.gethostname()
ADDR = (SERVER, PORT)
FORMAT = 'utf-8'

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

def handle_client(conn, addr):
    print(f"\nServer of {NAME}")
    print(f"\n[NEW CONNECTION] {addr} connected.")

    connected = True
    while connected:
        msg_length = conn.recv(HEADER).decode(FORMAT)
        if msg_length:
            msg_length = int(msg_length)
            msg = conn.recv(msg_length).decode(FORMAT)
            msg1 = msg.split(':')
            if int(msg1[1]) < 1 or int(msg1[1]) > 100:
                connected = False
                conn.send("DISCONNECTING...".encode(FORMAT))

            else:
                serverNo = random.randint(1,100)
                cl_name = msg1[0]
                print(f"\n[Server Response]:")
                print(f"[Client Name]: {cl_name[10:]}")
                print(f"[Client number]: {msg1[1]}")
                print(f"[Server's Name]: {NAME}")
                print(f"[Server's number]: {serverNo}")
```

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        print(f"[Sum of numbers]: {msg1[1]} +
{serverNo} = {int(msg1[1])+serverNo}")
        conn.send(f"[Server of {NAME}]:
{serverNo}".encode(FORMAT))
        conn.close()

def start():
    server.listen()
    print(f"[LISTENING] Server is listening on {SERVER}")
    while True:
        conn, addr = server.accept()
        thread = threading.Thread(target=handle_client,
args=(conn, addr))
        thread.start()
        print(f"\n[ACTIVE CONNECTIONS]
{threading.active_count()-1}")

print("[STARTING] Server is starting...")
start()

```

### CLIENT Code:

```

import socket

HEADER = 64
PORT = 5050
SERVER = socket.gethostbyname(socket.gethostname())
ADDR = (SERVER, PORT)
NAME = socket.gethostname()
FORMAT = 'utf-8'
DISCONNECT_MESSAGE = "exit"
ABORT = "DISCONNECTING..."

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

def send(msg):
    message = msg.encode(FORMAT)

```

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msg_length = len(message)
send_length = str(msg_length).encode(FORMAT)
send_length += b' '*(HEADER - len(send_length))
client.send(send_length)
client.send(message)
# data = client.recv(2048).decode(FORMAT)
# print(f"{data}")

clientMsg = ''
data = ""
while clientMsg != DISCONNECT_MESSAGE:
    num = int(input("\nEnter a number between 1 and 100: "))
    send(f"Client of {NAME}:{num}")
    data = client.recv(2048).decode(FORMAT)
    msg1 = data.split(':')
    print(f"{data}")
    if data == ABORT:
        clientMsg = DISCONNECT_MESSAGE
    else:
        print(f"[Sum of numbers]: {num} + {msg1[1]} = {num + int(msg1[1])}")

```

The screenshot displays two side-by-side Visual Studio Code windows. The left window, titled 'stemp.py - Socket Programming - Visual Studio Code', shows the server code. The code defines a server that listens on 172.27.34.117 and responds to client requests. The output window shows the server starting, listening, and receiving connections from 172.27.34.117. The right window, titled 'ctemp.py - Lab2 - Vis...', shows the client code. The code imports the socket module and defines a header of 64. The output window shows the client entering numbers and receiving responses from the server, including the sum of the numbers.

```

stemp.py
8 NAME = socket.gethostname()
9 ADDR = (SERVER, PORT)

ctemp.py
1 import socket
2
3 HEADER = 64

```

Output of stemp.py:

```

PS C:\Users\Beyond Adil\OneDrive\Documents\Computer Networking- Sem IV\Socket Programming\Lab2> python -u "c:\Users\Beyond Adil\OneDrive\Documents\Computer Networking- Sem IV\Socket Programming\Lab2\stemp.py"
[STARTING] Server is starting...
[LISTENING] Server is listening on 172.27.34.117
Server of Jazakallah
[ACTIVE CONNECTIONS] 1
[NEW CONNECTION] ('172.27.34.117', 5847) connected.
[Server Response]:
[Client Name]: Jazakallah
[Client number]: 43
[Server's Name]: Jazakallah
[Server's number]: 46
[Sum of numbers]: 43 + 46 = 89
[Server Response]:
[Client Name]: Jazakallah
[Client number]: 9
[Server's Name]: Jazakallah
[Server's number]: 79
[Sum of numbers]: 9 + 79 = 88

```

Output of ctemp.py:

```

Enter a number between 1 and 100: 43
[Server of Jazakallah]: 46
[Sum of numbers]: 43 + 46 = 89
Enter a number between 1 and 100: 9
[Server of Jazakallah]: 79
[Sum of numbers]: 9 + 79 = 88
Enter a number between 1 and 100:

```