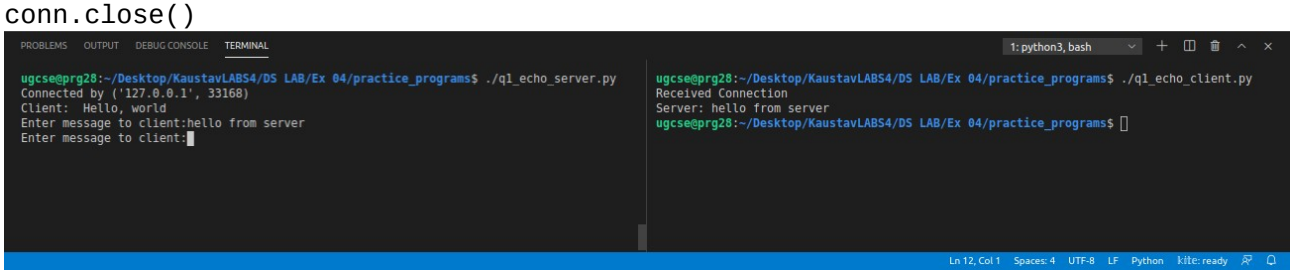
Q1 Echo Client

```
#!/usr/bin/env python3
import socket
HOST = '127.0.0.1'  # The server's hostname or IP address
PORT = 2053
# The port used by the server
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.connect((HOST, PORT))
    s.sendall(b'Hello, world')
    data = s.recv(1024)
    print('Received Connection')
    print('Server:', data.decode())
```

Q1 Echo Server

```
#!/usr/bin/env python3
import socket
HOST = '127.0.0.1'  # Standard loopback interface address (localhost)
PORT = 2053
# Port to listen on (non-privileged ports are > 1023)
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.bind((HOST, PORT))
    s.listen()
    conn, addr = s.accept()
    with conn:
        print('Connected by', addr)
        while True:
            data = conn.recv(1024)
            if data:
                print("Client: ", data.decode())
            data = input("Enter message to client:")
            if not data:
                break
            # sending message as bytes to client.
            conn.sendall(bytearray(data, 'utf-8'))
conn.close()
```

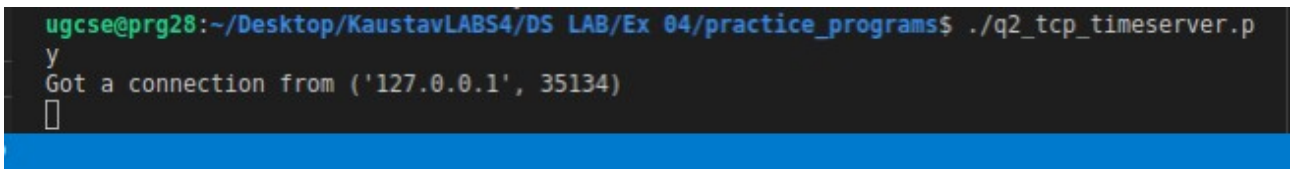


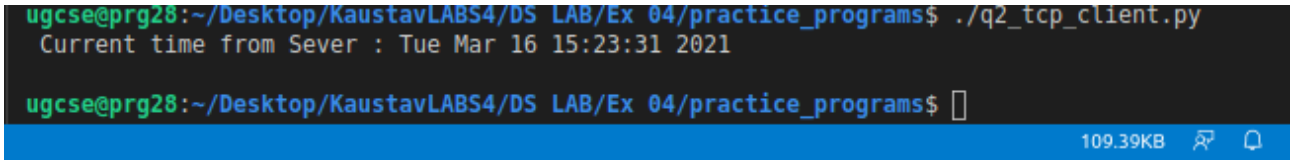
Q2 Client

```
#!/usr/bin/env python3
# client.py
import socket
# create a socket object
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
# get local machine name
host = socket.gethostname()
port = 9991
# connection to hostname on the port.
s.connect((host, port))
# Receive no more than 1024 bytes
tm = s.recv(1024)
print(' Current time from Sever :', tm.decode())
s.close()
```

Q2 Time Server

```
#!/usr/bin/env python3
# server.py
import socket
import time
# create a socket object
serversocket = socket.socket(
    socket.AF_INET, socket.SOCK_STREAM)
# get local machine name
host = socket.gethostname()
port = 9991
# bind to the port
serversocket.bind((host, port))
# queue up to 5 requests
serversocket.listen(5)
while True:
    # establish a connection
    clientsocket, addr = serversocket.accept()
    print("Got a connection from %s" % str(addr))
    currentTime = time.ctime(time.time()) + "\r\n"
    clientsocket.send(currentTime.encode('ascii'))
    clientsocket.close()
```



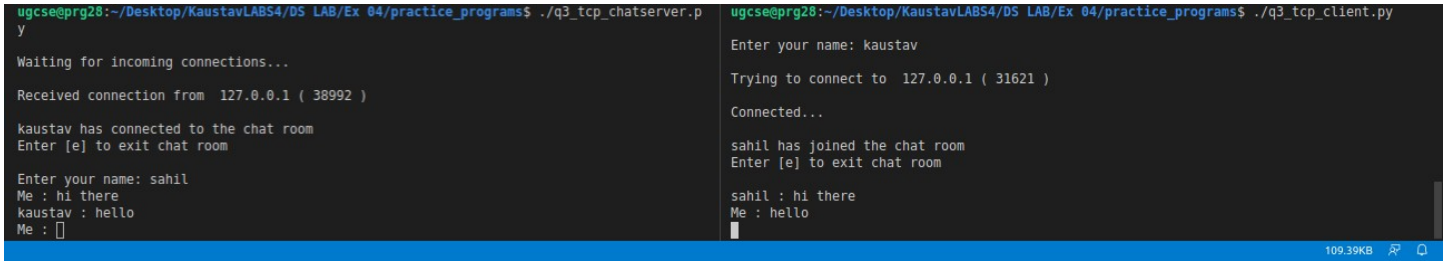


Q3 Chat Server

```
#!/usr/bin/env python3
# server.py
import socket
HOST = '127.0.0.1'  # Standard loopback interface address (localhost)
PORT = 31621  # Port to listen on (non-privileged ports are > 1023)
s = socket.socket()
s.bind((HOST, PORT))
s.listen()
print("\nWaiting for incoming connections...\n")
conn, addr = s.accept()
print("Received connection from ", addr[0], "(", addr[1], ")\n")
s_name = conn.recv(1024)
s_name = s_name.decode()
print(s_name, "has connected to the chat room\nEnter [e] to exit chat room\n")
name = input(str("Enter your name: "))
conn.send(name.encode())
while True:
    message = input(str("Me : "))
    if message == "[e]":
        message = "Left chat room!"
        conn.send(message.encode())
        print("\n")
        break
    conn.send(message.encode())
    message = conn.recv(1024)
    message = message.decode()
    print(s_name, ":", message)
```

Q3 Client

```
#!/usr/bin/env python3
import socket
HOST = '127.0.0.1'  # Standard loopback interface address (localhost)
PORT = 31621  # Port to listen on (non-privileged ports are > 1023)
s = socket.socket()
name = input(str("\nEnter your name: "))
print("\nTrying to connect to ", HOST, "(", PORT, ")\n")
s.connect((HOST, PORT))
print("Connected...\n")
s.send(name.encode())
s_name = s.recv(1024)
s_name = s_name.decode()
print(s_name, "has joined the chat room\nEnter [e] to exit chat room\n")
while True:
    message = s.recv(1024)
    message = message.decode()
    print(s_name, ":", message)
    message = input(str("Me : "))
    if message == "[e]":
        message = "Left chat room!"
        s.send(message.encode())
        print("\n")
        break
    s.send(message.encode())
```



Q4 Client

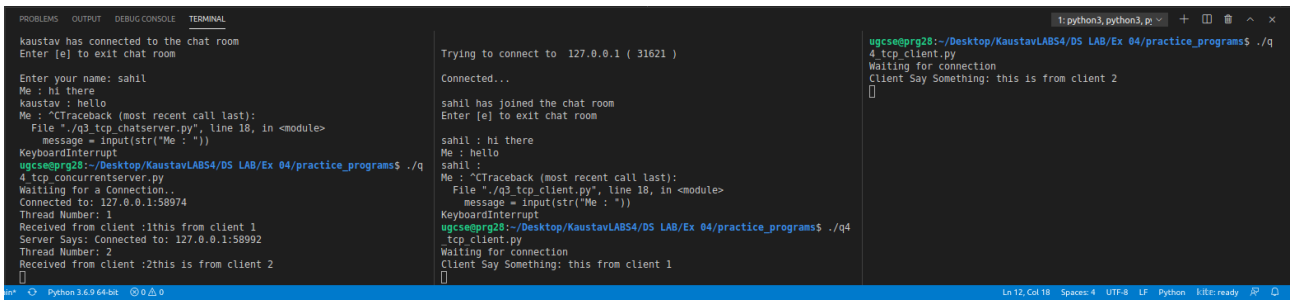
```
#!/usr/bin/env python3
import socket
ClientSocket = socket.socket()
host = '127.0.0.1'
port = 11596
print('Waiting for connection')
try:
    ClientSocket.connect((host, port))
except socket.error as e:
    print(str(e))
Response = ClientSocket.recv(1024)
while True:
    Input = input('Client Say Something: ')
    ClientSocket.send(str.encode(Input))
    Response = ClientSocket.recv(1024)
    print('From Server : ' + Response.decode())
ClientSocket.close()
```

Q4 Concurrent Server

```
#!/usr/bin/env python3
import socket
import os
from _thread import *
ServerSocket = socket.socket()
host = '127.0.0.1'
port = 11596
ThreadCount = 0
try:
    ServerSocket.bind((host, port))
except socket.error as e:
    print(str(e))
print('Waitiing for a Connection..')
ServerSocket.listen(5)


def threaded_client(connection):
    connection.send(str.encode('Welcome to the Server'))
    while True:
        data = connection.recv(2048)
        print('Received from client :' + str(ThreadCount) + data.decode())
        Inputs = input('Server Says: ')
        if not data:
            break
        connection.sendall(Inputs.encode())
    connection.close()


while True:
    Client, address = ServerSocket.accept()
    print('Connected to: ' + address[0] + ':' + str(address[1]))
    start_new_thread(threaded_client, (Client, ))
    ThreadCount += 1
    print('Thread Number: ' + str(ThreadCount))
ServerSocket.close()
```


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
1: python3, python3, p
kaustav has connected to the chat room
Enter [e] to exit chat room
Enter your name: sahil
Me : hi there
kaustav : hello
Me : ^CTraceback (most recent call last):
File "./q3_tcp_chatserver.py", line 18, in <module>
message = input(str("Me : "))
KeyboardInterrupt
ugcse@prg28:~/Desktop/KaustavLABS4/DS LAB/Ex 04/practice_programs$ ./q4_tcp_concurrentserver.py
Waiting for a Connection..
Connected to: 127.0.0.1:58974
Thread Number: 1
Received from client :1this from client 1
Server Says: Connected to: 127.0.0.1:58992
Thread Number: 2
Received from client :2this is from client 2
Trying to connect to 127.0.0.1 (31621)
Connected...
sahil has joined the chat room
Enter [e] to exit chat room
sahil : hi there
Me : hello
sahil :
Me : ^CTraceback (most recent call last):
File "./q3_tcp_client.py", line 18, in <module>
message = input(str("Me : "))
KeyboardInterrupt
ugcse@prg28:~/Desktop/KaustavLABS4/DS LAB/Ex 04/practice_programs$ ./q4_tcp_client.py
Waiting for connection
Client Say Something: this from client 1
ugcse@prg28:~/Desktop/KaustavLABS4/DS LAB/Ex 04/practice_programs$ ./q4_tcp_client.py
Waiting for connection
Client Say Something: this is from client 2
Python 3.6.9 64-bit
Ln 12, Col 18
Spaces: 4
UTF-8
LF
Python
Kite: ready