# DS Lab Week #4

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**solved questions**

s1)

s1.py

```python
# SERVER SIDE
import socket

HOST = '127.0.0.1'
PORT = 4063

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
            conn.sendall(bytearray(data, 'utf-8'))

conn.close()
```

c1.py

```python
# CLIENT SIDE
import socket

HOST = '127.0.0.1'
PORT = 4063

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('Recieved Connection')
    print('Serve:', data.decode())
```

Output:

```
            conn.sendall(bytearray(data, 'utf-8'))
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL                    3: python3, bash

190905494@V310Z-000:~/Documents/DS/Week 4/solved/Q1$ python3 s1.py
Connected by ('127.0.0.1', 36980)
Client:  Hello, world
Enter message to client:Hello CLient!!
Enter message to client:

190905494@V310Z-000:~/Documents/DS/Week 4/solved/Q1$ python3 c1.py
Recieved Connection
Serve: Hello CLient!!
190905494@V310Z-000:~/Documents/DS/Week 4/solved/Q1$
```

s2)

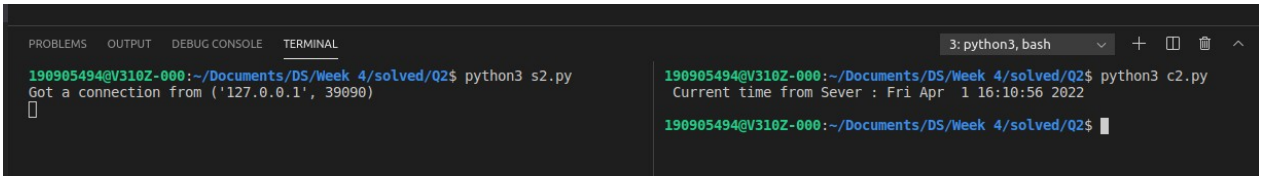
s2.py

```python
# 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()
```

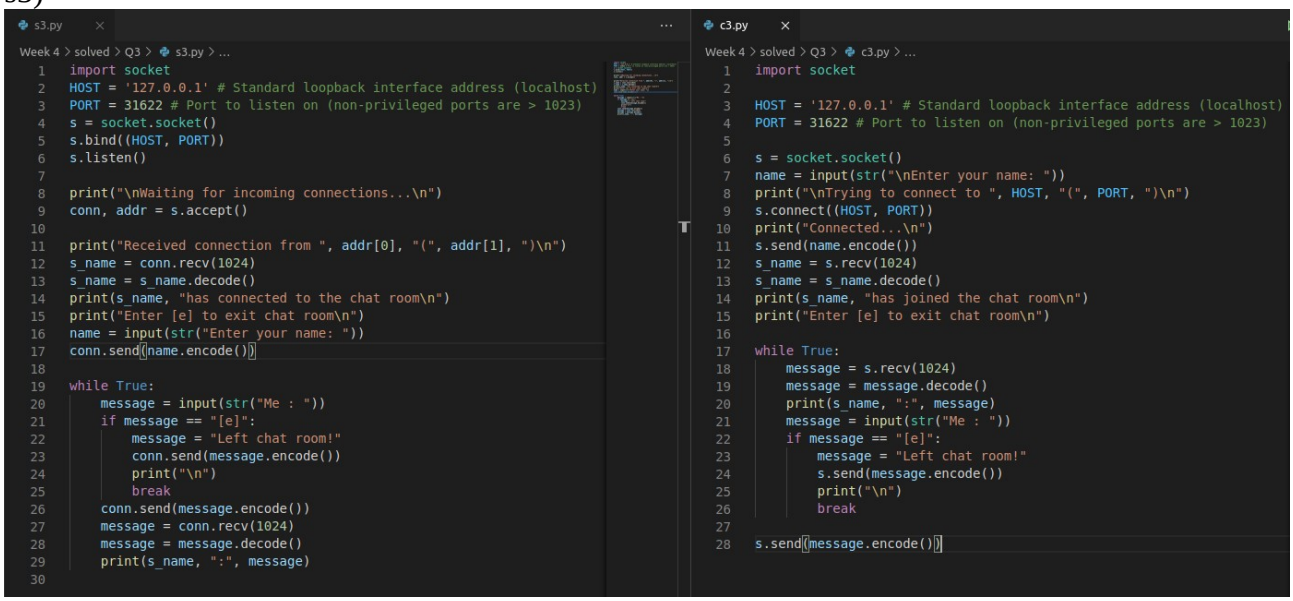
c2.py

```python
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()
```

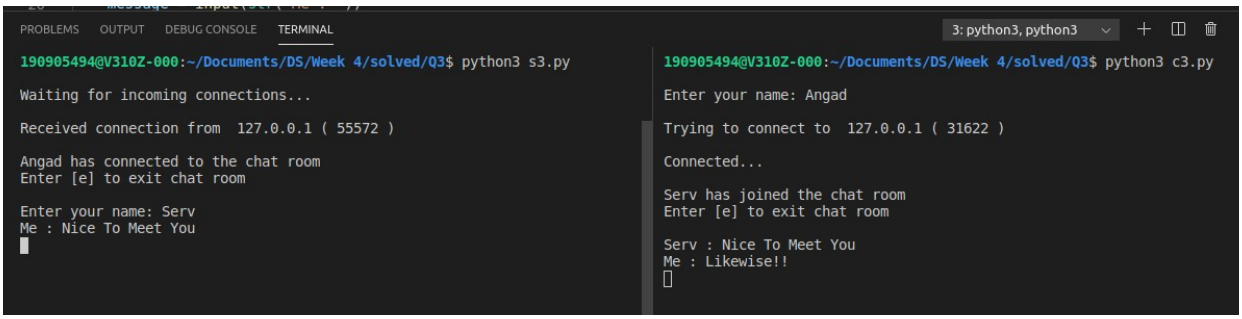
Output:




s3)




Output:



s4)

s4.py

Week 4 > solved > Q4 > s4.py > threaded_client

```python
# server.py
import socket
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()
```

c4.py

Week 4 > solved > Q4 > c4.py > ...

```python
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()

```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 3: python3, python3

```
190905494@V310Z-000:~/Documents/DS/Week 4/solved/Q4$ python3 s4.py
Waitiing for a Connection..
Connected to: 127.0.0.1:56152
Thread Number: 1
Received from client :1SOMETHING
Server Says: SAYS
Received from client :1Nice One
Server Says: Great One
```

```
190905494@V310Z-000:~/Documents/DS/Week 4/solved/Q4$ python3 c4.py
Waiting for connection
Client Say Something: SOMETHING
From Server : SAYS
Client Say Something: Nice One
From Server : Great One
Client Say Something:
```

**exersize questions**

Q1)

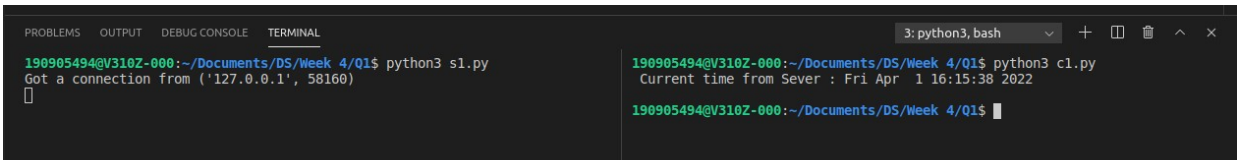
s1.py

```
Week 4 > Q1 > s1.py > ...
1  import socket
2  import time
3  serversocket = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
4  host = socket.gethostname()
5  port = 9991
6  serversocket.bind((host, port))
7  while True:
8      data,addr = serversocket.recvfrom(1024)
9      print("Got a connection from %s" % str(addr))
10     currentTime = time.ctime(time.time()) + "\r\n"
11     serversocket.sendto(currentTime.encode('ascii') , addr)
```

c1.py

```
Week 4 > Q1 > c1.py > ...
1  import socket
2  s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
3  udp_host = socket.gethostname()
4  udp_port = 9991
5  msg = 'hi'
6  s.sendto(msg.encode(),(udp_host,udp_port))
7  tm = s.recv(1024)
8  print(' Current time from Sever :', tm.decode())
9  s.close()
```

Output:




Q2)

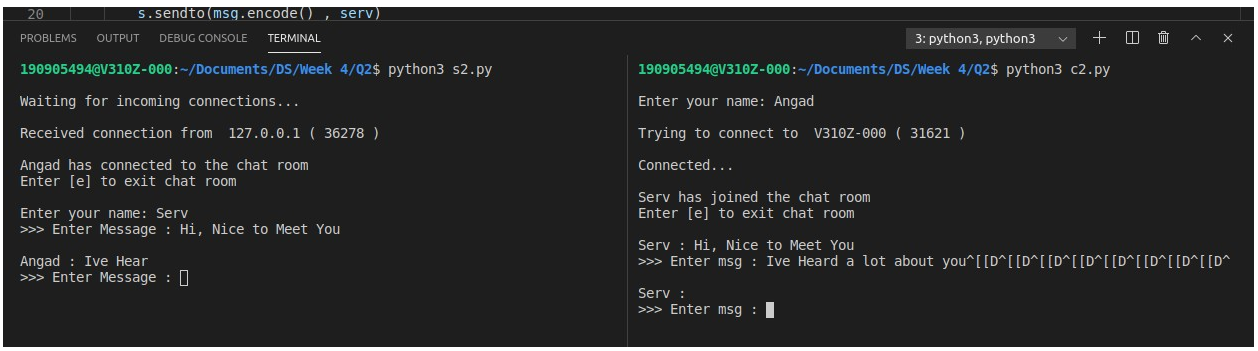
s2.py

```
Week 4 > Q2 > s2.py > ...
1  import socket
2  HOST = socket.gethostname()
3  PORT = 31621 # Port to listen on (non-privileged ports are > 1023)
4  s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
5  s.bind((HOST, PORT))
6  print("\nWaiting for incoming connections...\n")
7  data,addr = s.recvfrom(1024)
8  print("Received connection from ", addr[0], "(", addr[1], ")\n")
9
10 s_name, addr = s.recvfrom(1024)
11 s_name = s_name.decode()
12 print(s_name, "has connected to the chat room\n")
13 print("Enter [e] to exit chat room\n")
14 name = input(str("Enter your name: "))
15 s.sendto(name.encode('ascii') , addr)
16 while True:
17     msg = input(str(">>> Enter Message : "))
18     if msg == "[e]":
19         msg = "Left chat room!"
20         s.sendto(msg.encode() , addr)
21         print("\n")
22         break
23     s.sendto(msg.encode() , addr)
24     msg, addr = s.recvfrom(1024)
25     msg = msg.decode()
26     print(s_name, ":", msg)
```

c2.py

```
Week 4 > Q2 > c2.py > ...
1  import socket
2  # Port to listen on (non-privileged ports are > 1023)
3  serv = (socket.gethostname(), 31621)
4  HOST, PORT =  serv[0], serv[1]
5  s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
6  name = input(str("\nEnter your name: "))
7  print("\nTrying to connect to ", HOST, "(", PORT, ")\n")
8  s.sendto(b"" , serv)
9  print("Connected...\n")
10 s.sendto(name.encode('ascii') , serv)
11 s_name = s.recv(1024).decode()
12 print(s_name, "has connected to the chat room\n")
13 print("Enter [e] to exit chat room\n")
14 while True:
15     msg, addr = s.recvfrom(1024)
16     msg = msg.decode()
17     print(s_name, ":", msg)
18     msg = input(str(">>> Enter msg : "))
19     if msg == "[e]":
20         msg = "Left chat room!"
21         s.sendto(msg.encode() , serv)
22         print("\n")
23         break
24     s.sendto(msg.encode() , serv)
```

Output:



Q3)

s3.py

Week 4 > Q3 > s3.py > ...

```python
import socket

serv = ('172.16.57.222', 6060)
HOST, PORT = serv[0], serv[1]
s = socket.socket()
s.bind(serv)
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).decode()
print(s_name, "has connected to the chat room")
print("\nEnter 'bye' to exit chat room\n")
name = input(str("Enter your name: "))
conn.send(name.encode())
while True:
    msg = conn.recv(1024).decode()
    if(msg=='bye'):
        conn.close()
        break
    print(s_name, ":", msg)
    msg = input(str("Me : "))
    if msg == "bye":
        conn.send(msg.encode())
        print("\n")
        conn.close()
        break
    conn.send(msg.encode())
```

c3.py

Week 4 > Q3 > c3.py > ...

```python
import socket

serv = ('172.16.57.222', 12345)
HOST, PORT = serv[0], serv[1]

s = socket.socket()
name = input(str("\nEnter your name: "))
print("\nTrying to connect to ", HOST, "(", PORT, ")\n")
s.connect(serv)
print("Connected...\n")
s.send(name.encode())
s_name = s.recv(1024).decode()
print(s_name, "has connected to the chat room")
print("\nEnter 'bye' to exit chat room\n")
while True:
    msg = str(input("Me : "))
    if msg == "bye":
        print("Left chat room")
        s.send(msg.encode())
        print("\n")
        s.close()
        break
    s.send(msg.encode())
    msg = s.recv(1024).decode()
    if(msg=='bye'):
        print("exit initiated by server ")
        s.close()
        break
    print(s_name, ":", msg)
```

Output (server) :

```
190905494@V310Z-000:~/Documents/DS$ /usr/bin/python3.8 "/home/190905494/Documents/DS/Week 4/Q3/s3.py"

Waiting for incoming connections...

Received connection from  172.16.57.182 ( 47288 )

Danish has connected to the chat room
Enter 'bye' to exit chat room

Enter your name: Angad
Danish : HI HELLO BYE
Me : Nice to meet You
190905494@V310Z-000:~/Documents/DS$
```

Output (client) :

```
190905513@V310Z-000:~/Desktop/Distributed Systems Lab/Week_4/Q3$ python3 c3.py

Enter your name: Danish

Trying to connect to  172.16.57.222 ( 6060 )

Connected...

Angad has joined the chat room
Enter 'bye' to exit chat room

Me : HI HELLO BYE
Angad : Nice to meet You
Me : bye
Left chat room
```

Q4)

s4.py

Week 4 > Q4 > s4.py > ...

```python
import socket
serverIP = socket.gethostname()
serverPort = 16015
serverSock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
serverSock.bind((serverIP, serverPort))
serverSock.listen(1)
print("TCP server has started and is ready to receive")
connection, addr = serverSock.accept()
print("connected")
while True:
    data = connection.recv(1024)
    if not data:
        break
    data = data.decode()
    print(data)
    temp = [float(x) for x in data.split(' ')]
    print ("Received data:", temp)
    length = len(temp)
    maximum = max(temp)
    minimum = min(temp)
    total = sum(temp)
    mean = total/length
    msg = str(total) + " " + str(minimum) +
    " " + str(maximum) + " " + str(mean)
    connection.send(str.encode(msg))
```

c4.py

Week 4 > Q4 > c4.py > ...

```python
import socket
serverIP = socket.gethostname()
serverPort = 16015
clientSock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
clientSock.connect((serverIP, serverPort))
message = str(input("Input integers with space in between: "))
message2 = str(input("Enter the length of the set: "))
clientSock.send(str.encode(message))
data = clientSock.recv(1024)
data = data.decode()
temp = [float(x) for x in data.split(' ')]
print("The total of all numbers is: " + str(temp[0]))
print("The lowest number is: " + str(temp[1]))
print("The highest number is: " + str(temp[2]))
print("The mean is: " + str(temp[3]))
clientSock.close()
```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 3: bash, bash

```
190905494@V310Z-000:~/Documents/DS/Week 4/Q4$ python3 s4.py
TCP server has started and is ready to receive
connected
1 2 3 4 5
Received data: [1.0, 2.0, 3.0, 4.0, 5.0]
190905494@V310Z-000:~/Documents/DS/Week 4/Q4$
```

```
190905494@V310Z-000:~/Documents/DS/Week 4/Q4$ python3 c4.py
Input integers with space in between: 1 2 3 4 5
Enter the length of the set: 5
The total of all numbers is: 15.0
The lowest number is: 1.0
The highest number is: 5.0
The mean is: 3.0
190905494@V310Z-000:~/Documents/DS/Week 4/Q4$
```