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Practice 1

Server:

```
import socket
```

```
# host=socket.gethostname()
```

```
HOST = '127.0.0.1'
```

```
PORT = 2053
```

```
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
```

```
    s.bind((HOST,PORT))
```

```
    s.listen(5)
```

```
    conn,addr=s.accept()
```

```
    print("Hi")
```

```
    with conn:
```

```
        print("Connected by :",addr)
```

```
        while True:
```

```
            data=conn.recv(1024)
```

```
            if data:
```

```
                print("From client got:",data.decode())
```

```
                data=input("Enter msg to client:")
```

```
            if not data:
```

```
                break
```

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

```
print("Hello")
```

```
conn.close()
```

Client

```
import socket
```

```
HOST='127.0.0.1'
```

```
PORT=2053
```

```
with socket.socket(socket.AF_INET,socket.SOCK_STREAM) as s:
```

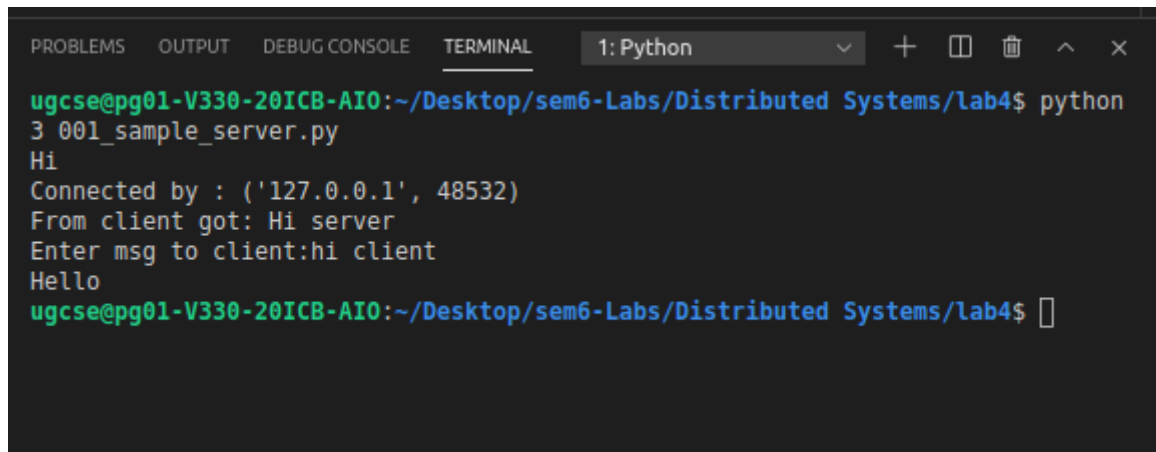
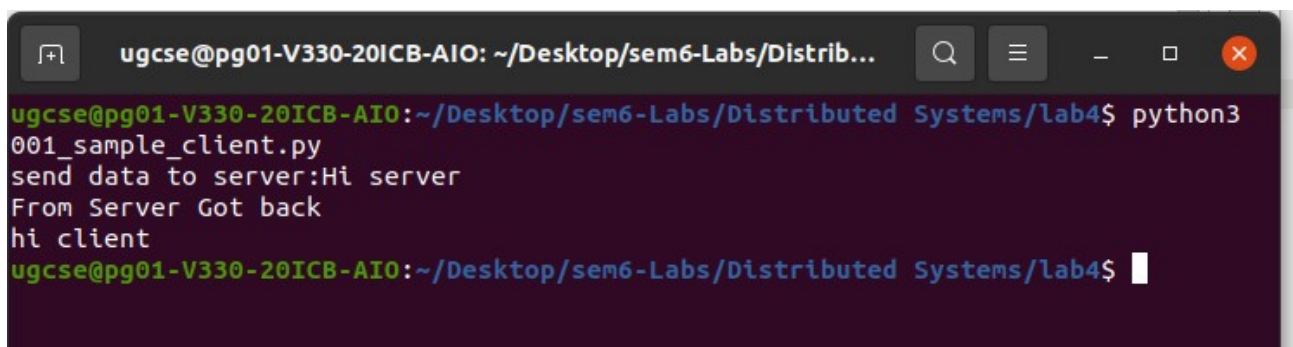
```
    s.connect((HOST,PORT))
```

```
    data=input("send data to server:")
```

```
    s.sendall(bytearray(data,'utf-8'))
```

```
    data=s.recv(1024)
```

```
print("From Server Got back")
print(data.decode())
```

A terminal window titled '1: Python' showing the execution of a Python script. The prompt is 'ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4\$'. The user runs 'python 3 001_sample_server.py'. The output shows a connection from '127.0.0.1' on port 48532, receiving 'Hi' from the client, and the server responding with 'Hello' after the user enters 'hi client'.A terminal window showing the execution of a Python script. The prompt is 'ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...'. The user runs 'python3 001_sample_client.py'. The output shows the client sending 'Hi server' to the server, receiving 'From Server Got back' in response, and then sending 'hi client' to the server.

Practice 2

Server

```
import socket
import time

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

host=socket.gethostname()

port=9992

serversoc.bind((host,port))

serversoc.listen(5)

while True:
    conn,addr=serversoc.accept()

    print("Got connection from :",addr[0],addr[1])
```

```
currentTime=time.ctime(time.time())

conn.send(currentTime.encode('ascii'))
conn.close()
serversoc.close()
```

Client

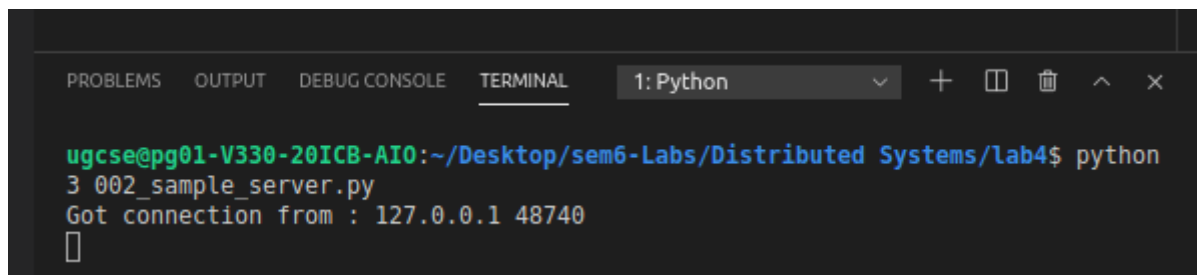
```
import socket
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
host=socket.gethostname()
port=9992

s.connect((host,port))

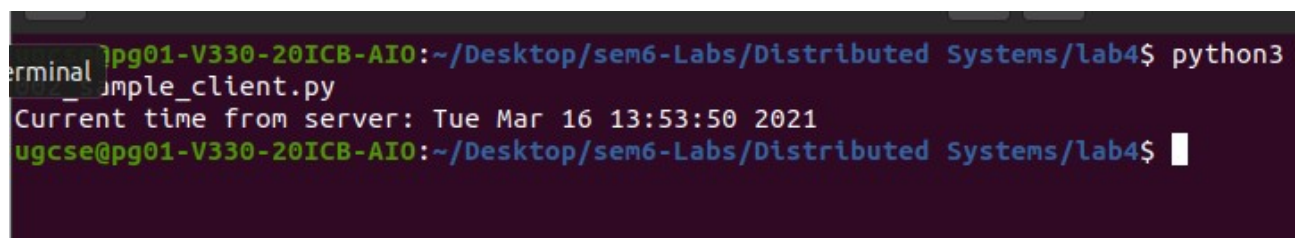
tm=s.recv(1024)

print("Current time from server:",tm.decode())

s.close()
```



A screenshot of a terminal window with a dark background. The terminal shows the command `python 3 002_sample_server.py` being executed. The output is `Got connection from : 127.0.0.1 48740`, followed by a blank line. The terminal window has tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', and 'TERMINAL', with 'TERMINAL' selected. A dropdown menu shows '1: Python'.



A screenshot of a terminal window with a dark background. The terminal shows the command `python3 002_sample_client.py` being executed. The output is `Current time from server: Tue Mar 16 13:53:50 2021`, followed by a blank line. The terminal window has tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', and 'TERMINAL', with 'TERMINAL' selected. A dropdown menu shows '1: Python'.

Practice 3

Client

```
import socket
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
host=socket.gethostname()
port=9991

s.connect((host,port))
```

```

while True:
    print("Client:",end=' ')
    data=str(input())
    temp=data
    s.sendall(bytearray(data,'utf-8'))
    if temp.lower()=='bye':
        break

    data=s.recv(1024)
    print("Server:",data.decode())
    if data.decode().lower()=='bye':
        break

```

```

s.close()

```

Server

```

import socket
import time

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

host=socket.gethostname()

port=9991

serversoc.bind((host,port))

serversoc.listen(5)

conn,addr=serversoc.accept()

while True:

    data=conn.recv(1024)

    if data:
        print("Client: ",data.decode())
        if data.decode().lower()=='bye':
            break

    print("Server:",end=' ')
    send_data=str(input())

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

    if send_data.lower()=='bye':
        break

```

```
serversoc.close()
```

```
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python 3 003_sample_server.py
Client: Hi server
Server: Hi client
Client: How are you doing?
Server: Doing Good
Client: Bye
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$
```

```
ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3 003_sample_client.py
Client: Hi server
Server: Hi client
Client: How are you doing?
Server: Doing Good
Client: Bye
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$
```

Practice 4

Server

```
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('Waiting 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()

```

Client 1

```

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()

```

Client 2

```

import socket

ClientSocket = socket.socket()

host = '127.0.0.1'

```

```

port = 11596

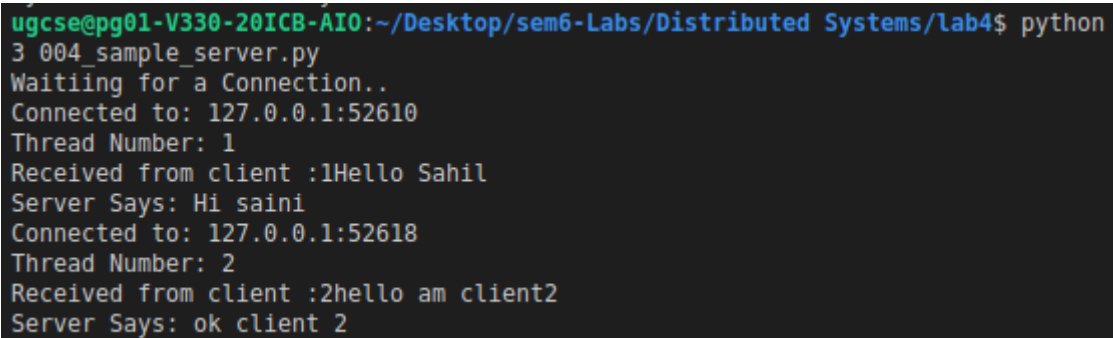
print('Waiting for connection')

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()

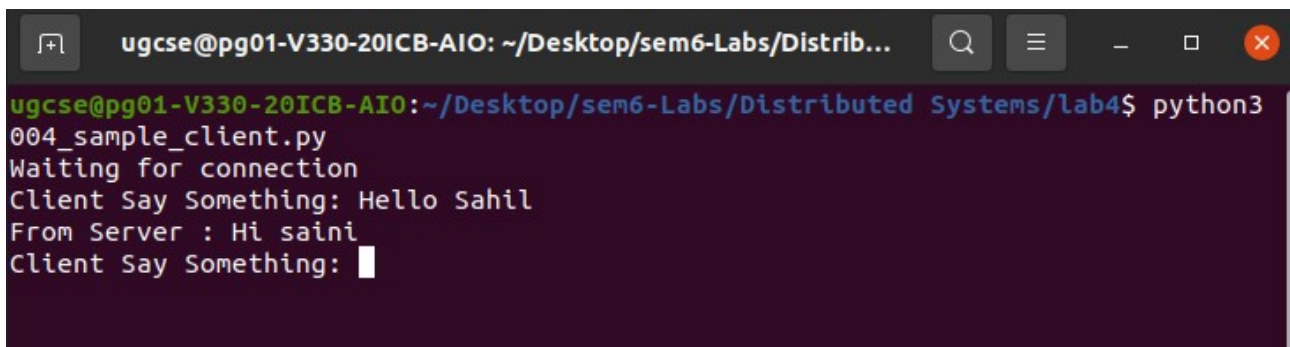
```



```

ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distributed Systems/lab4$ python
3 004_sample_server.py
Waiting for a Connection..
Connected to: 127.0.0.1:52610
Thread Number: 1
Received from client :1Hello Sahil
Server Says: Hi saini
Connected to: 127.0.0.1:52618
Thread Number: 2
Received from client :2hello am client2
Server Says: ok client 2

```



```

ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3
004_sample_client.py
Waiting for connection
Client Say Something: Hello Sahil
From Server : Hi saini
Client Say Something: 

```

```
ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3
004_sample_client2.py
Waiting for connection
Client Say Something: hello am client2
From Server : ok client 2
Client Say Something: 
```

EXERCISE

Question 1:

Server

```
import socket
import time
```

```
serversoc=socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
```

```
host=socket.gethostname()
port=9992
```

```
serversoc.bind((host,port))
```

```
while True:
```

```
    data_got=serversoc.recvfrom(1024)
    address=data_got[1]
    currentTime=time.ctime(time.time())
```

```
    serversoc.sendto(currentTime.encode('ascii'),address)
```

```
serversoc.close()
```

Client

```
import socket
```

```
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
host=socket.gethostname()
```

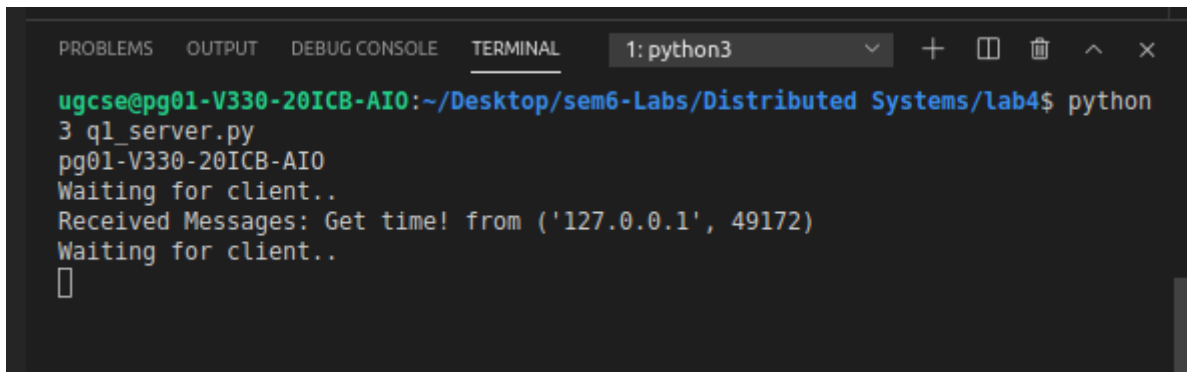


```
port=9992
```

```
address=(host,port)
```

```
s.sendto(bytearray("Hi there",'utf-8'),address)
tm=s.recvfrom(1024)
print("Current time from server:",tm.decode())
```

```
s.close()
```



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: python3
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python
3 q1_server.py
pg01-V330-20ICB-AIO
Waiting for client..
Received Messages: Get time! from ('127.0.0.1', 49172)
Waiting for client..
[]
```



```
ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3
q1_clien.py
pg01-V330-20ICB-AIO
UDP target IP: pg01-V330-20ICB-AIO
UDP target Port: 12345
Time is: Tue Mar 16 15:57:12 2021
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$
```

Question2

Server

```
import socket as skt
import time
sock = skt.socket(skt.AF_INET, skt.SOCK_DGRAM)
```

```
udp_host = skt.gethostname()
udp_port = 12345
```

```
sock.bind((udp_host, udp_port))
print("Waiting for client")
data, addr = sock.recvfrom(1024)
msg = 'Server'
sock.sendto(msg.encode(), addr)
```

```

name = data.decode()
while True:
    data, addr = sock.recvfrom(1024)
    if data.decode() == 'exit':
        print(name, ' has exited')
    else:
        print(name, ": ", data.decode())
    msg = input('Me: ')

    sock.sendto(msg.encode(), addr)
    if msg == 'exit':
        break

```

Client

```

import socket as skt

sock = skt.socket(skt.AF_INET, skt.SOCK_DGRAM)

udp_host = skt.gethostname()
print(udp_host)
udp_port = 12345
msg = "Hello brother"
print("Target UDP host {} \n Target UDP port {}".format(str(udp_host), str(udp_port)))

msg = 'Client'
sock.sendto(msg.encode(), (udp_host, udp_port))
data, addr = sock.recvfrom(1024)
name = data.decode()

while True:
    msg = input('Me: ')
    sock.sendto(msg.encode(), (udp_host, udp_port))
    if msg == 'exit':
        break
    data, addr = sock.recvfrom(1024)
    if data.decode() == 'exit':
        print(name, ' has exited')
    else:
        print(name, ": ", data.decode())

```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: python3
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python
3 q2_server.py
Waiting for client
Get time! : Client
Me: Hi Sahil
Get time! : Hi Saini
Me: Hello
Get time! : Hi
Me: []
```

```
ugcse@pg01-V330-20ICB-AIO: ~/Desktop/sem6-Labs/Distrib...
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3
q2_
q2_clent.py q2_server.py
ugcse@pg01-V330-20ICB-AIO:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3
q2_clent.py
pg01-V330-20ICB-AIO
Target UDP host pg01-V330-20ICB-AIO
Target UDP port 12345
Me: Hi Saini
Hi Sahil : Hello
Me: Hi
█
```

Question 3:

Server

```
import socket
```

```
HOST = '172.16.58.54'
```

```
PORT = 2003
```

```
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)

```

Client

```

import socket
HOST = '172.16.58.54'
PORT = 2003
s = socket.socket()
name = input(str("\\nEnter your name: "))
s.connect((HOST, PORT))
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())

```

```
ugcse@pg01-V330-20ICB-A10:~/Desktop/sem6-Labs/Distributed Systems/lab4$ hostname -I
172.16.58.54 192.168.122.1
ugcse@pg01-V330-20ICB-A10:~/Desktop/sem6-Labs/Distributed Systems/lab4$ python3 q3_server.py
```

3/3

Me :

[illegible]