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# 180905330

**Exercises:**

Q1)
Client:

```
import socket

with socket.socket(socket.AF_INET,socket.SOCK_DGRAM) as sock:

    initialMessage="Send time"
    sock.sendto(initialMessage.encode(),('127.0.0.1',8000))

    date_time=sock.recv(1024)
    date_time=date_time.decode()

    print(f'Date received from server: {date_time}')

sock.close()
```

Server:

```
import socket
import time

with socket.socket(socket.AF_INET,socket.SOCK_DGRAM) as sock:
    sock.bind(('127.0.0.1',8000))
    print('Server started on port 8000')

    try:
        while True:
            _,addr=sock.recvfrom(1024)
            print(f'Sending time to {addr}')

            currentTime = time.ctime(time.time())
            sock.sendto(currentTime.encode('ascii'),addr)

    except KeyboardInterrupt:
        print('\nServer closing')
        sock.close()
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q1_server.py
Server started on port 8000
Sending time to ('127.0.0.1', 35364)
^C
Server closing
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q1_client.py
Date received from server: Sat May  8 16:40:07 2021
```

Q2)
Client:

```
import socket

server_address=('127.0.0.1',8000)

with socket.socket(socket.AF_INET,socket.SOCK_DGRAM) as sock:



    try:
        initialMessage=input('Enter initial message to send:  ')
        sock.sendto(initialMessage.encode(),server_address)
        while True:
            server_message,_=sock.recvfrom(1024)
            print(f'Server: {server_message.decode()}')
            sending_message=input('You:  ')
            sock.sendto(sending_message.encode(),server_address)


    except KeyboardInterrupt:
        print('\nClosing chat...')
        sock.close()
```

Server:

```
import socket
import time

with socket.socket(socket.AF_INET,socket.SOCK_DGRAM) as sock:
    sock.bind(('127.0.0.1',8000))
    print('Server started on port 8000')

    try:
        while True:
            message,addr=sock.recvfrom(1024)
            print(f'Client: {message.decode()}')

            sending_message=input('You:  ')
            sock.sendto(sending_message.encode(),addr)

    except KeyboardInterrupt:
        print('\nServer closing')
        sock.close()
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q2_client.py
Enter initial message to send:  hi
Server: hello
You:
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q2_server.py
Server started on port 8000
Client: hi
You:  hello
```

Q3)
Cient:

```
import sys
import socket
import select

def main():
    if len(sys.argv) != 3:
        print("usage: %s [ip adress][port] " % sys.argv[0] )
        return(-1)
    with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
        s.connect((sys.argv[1], int(sys.argv[2])))

        while True:
            s_msg = input().replace('b', '').encode('utf-8')
            if s_msg == '':
                break
            else:
                s.sendall(s_msg)
            r_msg = s.recv(1024)
            if r_msg == '':
                break
            else:
                print(r_msg.decode())

if __name__ == '__main__':
    main()
```

Server:

```
import sys
import socket

def main():

    with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
        s.bind(('', 11111))
        s.listen(1)

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

            while True:
                received = conn.recv(1024)
                if received == '':
                    break
                else:
                    print(received.decode())

                send_msg = input().replace('b', '').encode()
```

```
            if send_msg == ' ':
                break
            else:
                conn.sendall(send_msg)
                print("sent")

if __name__ == '__main__':
    main()
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q3_server.py
hello
hi
sent
hello
server sent
sent
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4$ python3.6 q3_client.py 127.0.0.1 11111
hello
hi
hello
server sent
```

Solved Programs:

UDP Client-Server
Client:

```
import socket
sock = socket.socket(socket.AF_INET,socket.SOCK_DGRAM)      # For UDP
udp_host = socket.gethostname()# Host IP
udp_port = 12345# specified port to connect
msg = "UDP Program!"
print ("UDP target IP:", udp_host)
print ("UDP target Port:", udp_port)
sock.sendto(msg.encode(),(udp_host,udp_port))
```

Server:

```
import socket
sock = socket.socket(socket.AF_INET,socket.SOCK_DGRAM)      # For UDP
udp_host = socket.gethostname()# Host IP
udp_port = 12345# specified port to connect
sock.bind((udp_host,  udp_port))
while True:
    print ("Waiting for client...")
    data,addr = sock.recvfrom(1024)#receive data from client
    print ("Received Messages:",data.decode()," from",addr)
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 trial_1_client.py
UDP target IP: omkar
UDP target Port: 12345
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additional Exercise$ python
3.6 trial_1_server.py
Waiting for client...
Received Messages: UDP Program!  from ('127.0.0.1', 33808)
Waiting for client...
```

1A) Write a program where client can send a message to the server and the server can receive the message and send, or echo, it back to the client.

Client:

```
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())
```

Server:

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

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additional Exercise$ python
3.6 q1_client.py
Received Connection
Server: hello
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q1_server.py
Connected by ('127.0.0.1', 42442)
Client:  Hello, world
Enter message to client:hello
```

Q2)
Client:

```
import socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
host = socket.gethostname()
port = 9991
s.connect((host, port))
tm = s.recv(1024)
print(' Current time from Sever :', tm.decode())
s.close()
```

Server:

```
import socket
import time
serversocket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
host = socket.gethostname()
port = 9991
serversocket.bind((host, port))
serversocket.listen(5)
while True:
        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()
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q2_client.py
 Current time from Sever : Sat May  8 17:11:05 2021
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q2_server.py
Got a connection from ('127.0.0.1', 52392)
```

Q3)
Client:

```
import socket
HOST = '127.0.0.1'
PORT = 31621
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())
```

Server:

```
import socket
HOST = '127.0.0.1'
PORT = 31621
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)
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q3_client.py

Enter your name: Omkar

Trying to connect to  127.0.0.1 ( 31621 )

Connected...

Server has joined the chat room
Enter [e] to exit chat room

Server : hello
Me : hi
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q3_server.py

Waiting for incoming connections...

Received connection from  127.0.0.1 ( 45972 )

Omkar has connected to the chat room
Enter [e] to exit chat room

Enter your name: Server
Me : hello
Omkar : hi
Me :
```

Q4)
Client:

```
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()
```

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('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()
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q4_client.py
Waiting for connection
Client Say Something: hello
From Server : hi
Client Say Something:
```

```
omkar@omkar:~/Desktop/College/Distributed Systems/180905330 DS Lab/Lab 4/Additio
nal Exercise$ python3.6 q4_server.py
Waitiing for a Connection..
Connected to: 127.0.0.1:36884
Thread Number: 1
Received from client :1hello
Server Says: hi
```