COMPUTER NETWORKS ASSIGNMENT

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MCA(R)

SOCKET PROGRAMING IN PYTHON

To achieve Socket Programming in Python, you will need to import the socket module or framework. This module consists of built-in methods that are required for creating sockets and help them associate with each other.

USING UDP:

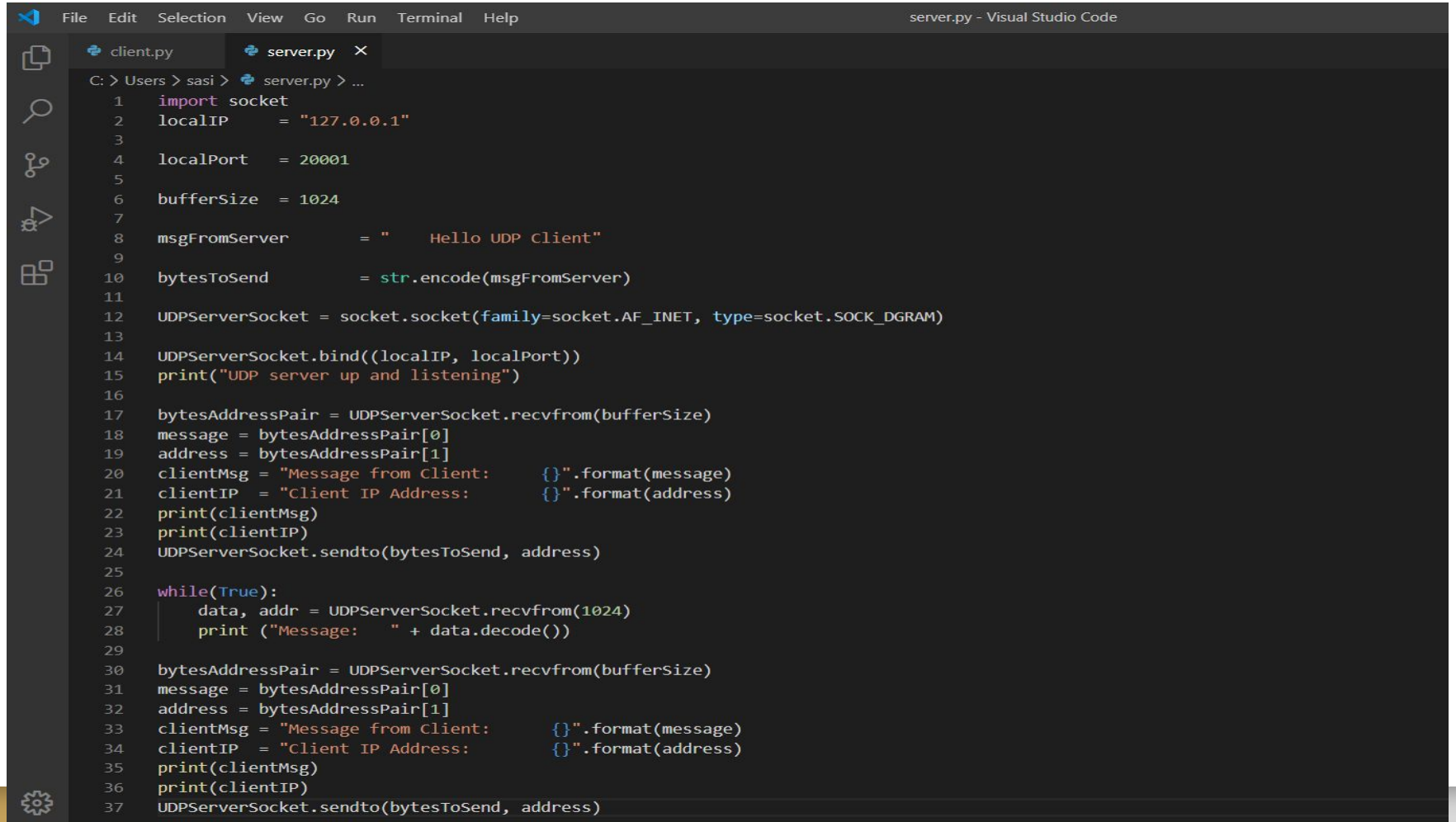
UDP is a *message oriented* protocol. UDP does not require a long-lived connection, so setting up a UDP socket is a little simpler. On the other hand, UDP messages must fit within a single packet (for IPv4, that means they can only hold 65,507 bytes because the 65,535 byte packet also includes header information) and delivery is not guaranteed as it is with TCP.

USING TCP:

Network devices (for example, routers and switches), have finite bandwidth available and their own inherent system limitations. They have CPUs, memory, buses, and interface packet buffers, just like our clients and servers. TCP relieves you from having to worry about packet loss, data arriving out-of-order, and many other things that invariably happen when you're communicating across a network.

USING UDP IN PYTHON

SERVER


File Edit Selection View Go Run Terminal Help
server.py - Visual Studio Code
client.py
server.py
C: > Users > sasi > server.py > ...
1 import socket
2 localIP = "127.0.0.1"
3
4 localPort = 20001
5
6 bufferSize = 1024
7
8 msgFromServer = " Hello UDP Client"
9
10 bytesToSend = str.encode(msgFromServer)
11
12 UDPServerSocket = socket.socket(family=socket.AF_INET, type=socket.SOCK_DGRAM)
13
14 UDPServerSocket.bind((localIP, localPort))
15 print("UDP server up and listening")
16
17 bytesAddressPair = UDPServerSocket.recvfrom(bufferSize)
18 message = bytesAddressPair[0]
19 address = bytesAddressPair[1]
20 clientMsg = "Message from Client: {}".format(message)
21 clientIP = "Client IP Address: {}".format(address)
22 print(clientMsg)
23 print(clientIP)
24 UDPServerSocket.sendto(bytesToSend, address)
25
26 while(True):
27 data, addr = UDPServerSocket.recvfrom(1024)
28 print ("Message: " + data.decode())
29
30 bytesAddressPair = UDPServerSocket.recvfrom(bufferSize)
31 message = bytesAddressPair[0]
32 address = bytesAddressPair[1]
33 clientMsg = "Message from Client: {}".format(message)
34 clientIP = "Client IP Address: {}".format(address)
35 print(clientMsg)
36 print(clientIP)
37 UDPServerSocket.sendto(bytesToSend, address)

CLIENT

File Edit Selection View Go Run Terminal Help client.py - Visual Studio Code

client.py server.py

C: > Users > sasi > client.py > ...

```python
import socket

msgFromClient       = "   Hello UDP Server".encode()

bytesToSend         = str.encode(msgFromClient)

serverAddressPort   = ("127.0.0.1", 20001)

bufferSize          = 1024

UDPClientSocket = socket.socket(family=socket.AF_INET, type=socket.SOCK_DGRAM)

UDPClientSocket.sendto(bytesToSend, serverAddressPort)

msgFromServer = UDPClientSocket.recvfrom(bufferSize)

msg = "Message from Server {}     ".format(msgFromServer[0])
print(msg)

while True:
    msg = str(input("Enter your message::  "))
    msg = msg.encode()
    UDPClientSocket.sendto(msg, (serverAddressPort))

UDPClientSocket.sendto(bytesToSend, serverAddressPort)

msgFromServer = UDPClientSocket.recvfrom(bufferSize)

msg = "Message from Server {}     ".format(msgFromServer[0])

print(msg)

```

OUTPUT

Command Prompt - python server.py

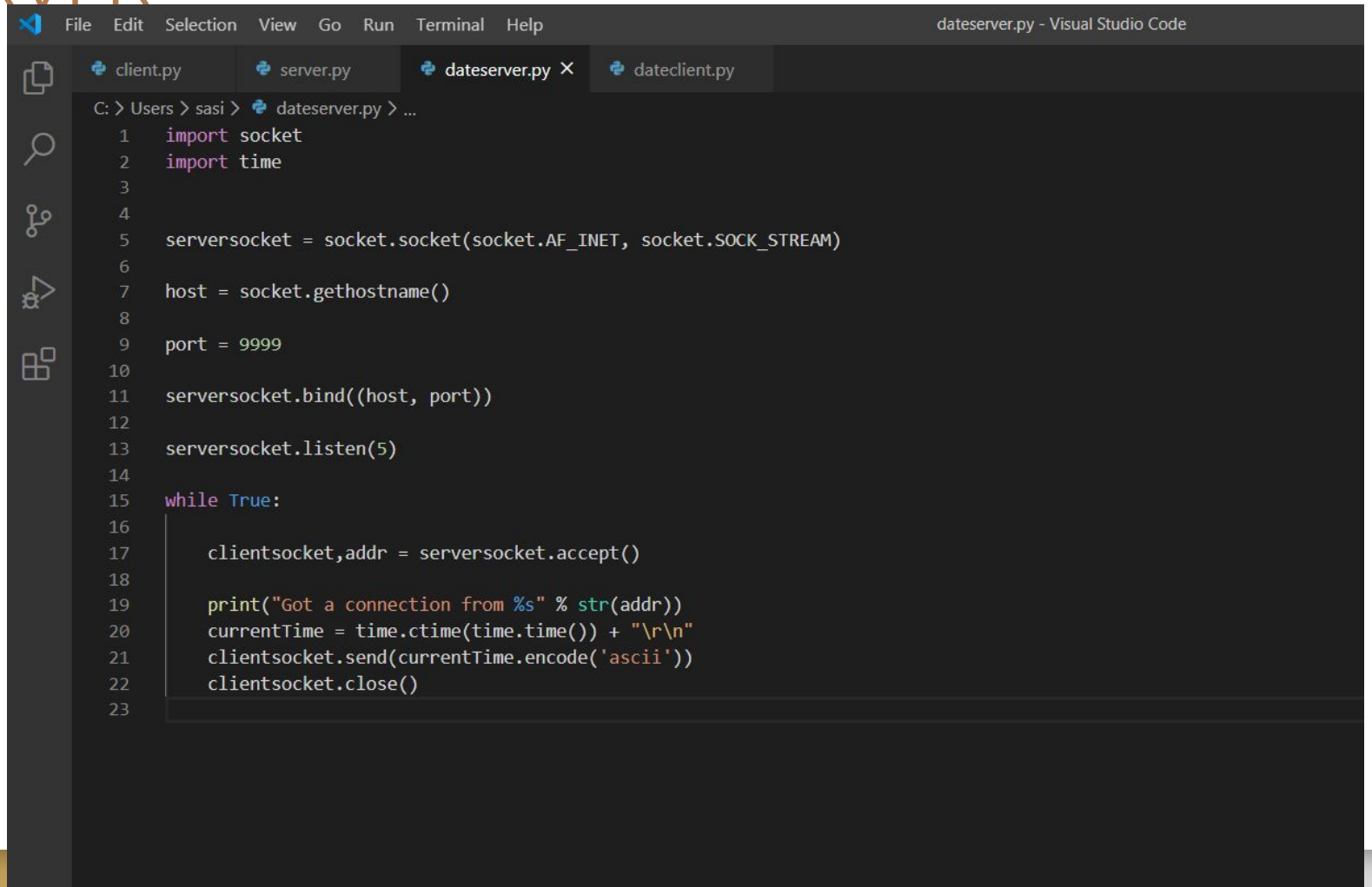
```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\sasi>python server.py
UDP server up and listening
Message from Client:        Hello UDP Server
Client IP Address:       ('127.0.0.1', 56356)
Message:   1
Message:   24
Message:      Hello UDP Server
```

Command Prompt - python client.py

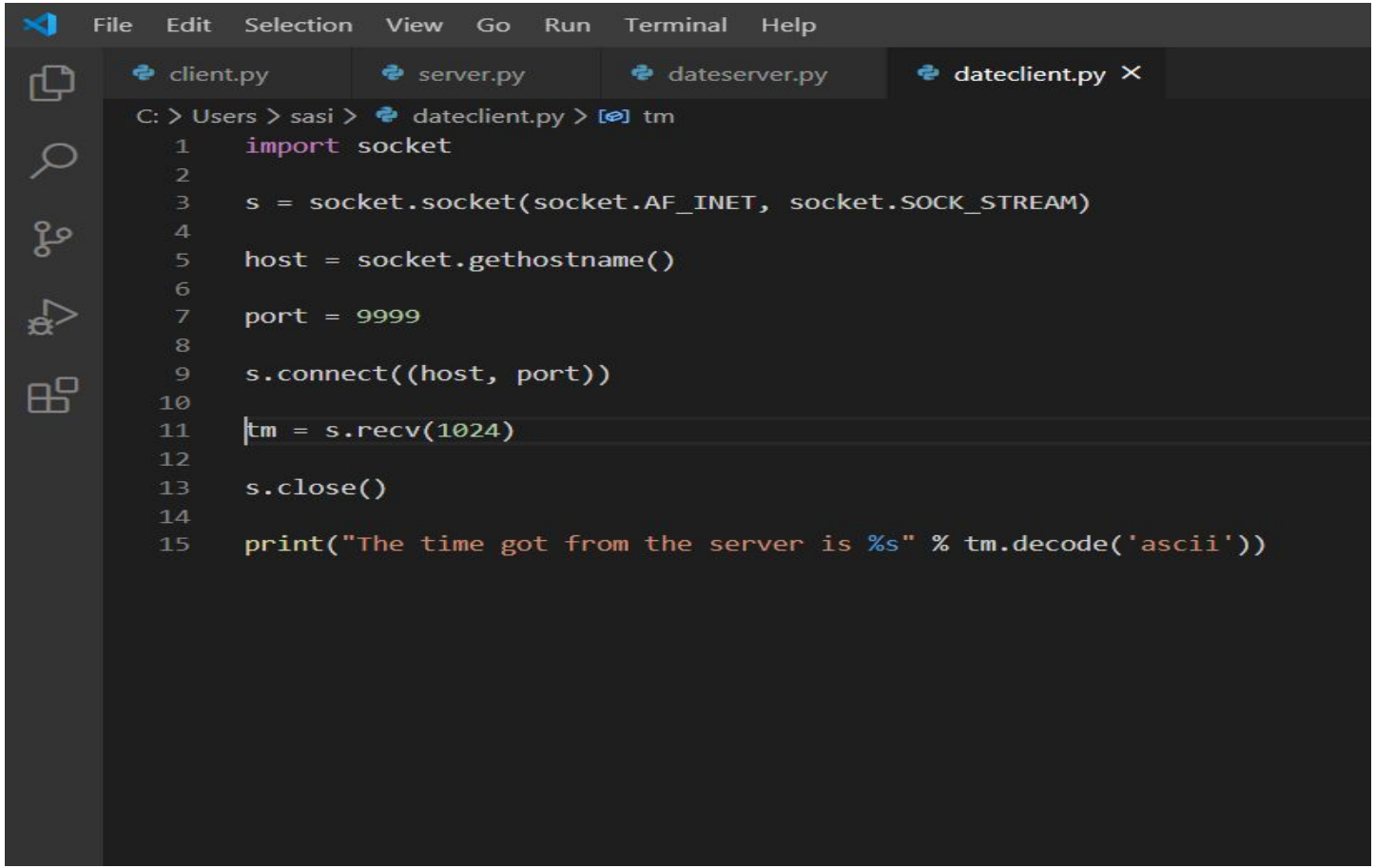
```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\sasi>python client.py
Message from Server     Hello UDP Client
Enter your message::  1
Enter your message::  24
Enter your message::  Hello UDP Server
```

USING TCP IN PYTHON

SERVER


File Edit Selection View Go Run Terminal Help
dateserver.py - Visual Studio Code
client.py
server.py
dateserver.py
dateclient.py
C: > Users > sasi > dateserver.py > ...
import socket
import time
serversocket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
host = socket.gethostname()
port = 9999
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()

CLIENT


File Edit Selection View Go Run Terminal Help
client.py
server.py
dateserver.py
dateclient.py
C: > Users > sasi > dateclient.py > tm
1 import socket
2
3 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
4
5 host = socket.gethostname()
6
7 port = 9999
8
9 s.connect((host, port))
10
11 tm = s.recv(1024)
12
13 s.close()
14
15 print("The time got from the server is %s" % tm.decode('ascii'))

OUTPUT

Command Prompt - python dateserver.py

```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\sasi>python dateserver.py
Got a connection from ('192.168.29.48', 59970)
```

Command Prompt

```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\sasi>python dateclient.py
The time got from the server is Sun Aug 23 09:08:30 2020


C:\Users\sasi>
```