UDP server and client:
Note: It doesn't matter which file server.py or client.py that I run first. However, before entering the string, I have to run the server.py. Otherwise, it will get an error message.

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```
from socket import*

serverName = 'sp3'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)

message = raw_input('Input lowercase sentence:')

clientSocket.sendto(message.encode(), (serverName, serverPort))
modifiedMessage, serverAddress = clientSocket.recvfrom(2048)
print modifiedMessage.decode()
clientSocket.close()
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```

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```
from socket import*

serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)

serverSocket.bind(("", serverPort))
print("The server is ready to receive")

while True:
        message, clientAddress = serverSocket.recvfrom(2048)
        modifiedMessage = message.decode().upper()
        serverSocket.sendto(modifiedMessage.encode(), clientAddress)


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```

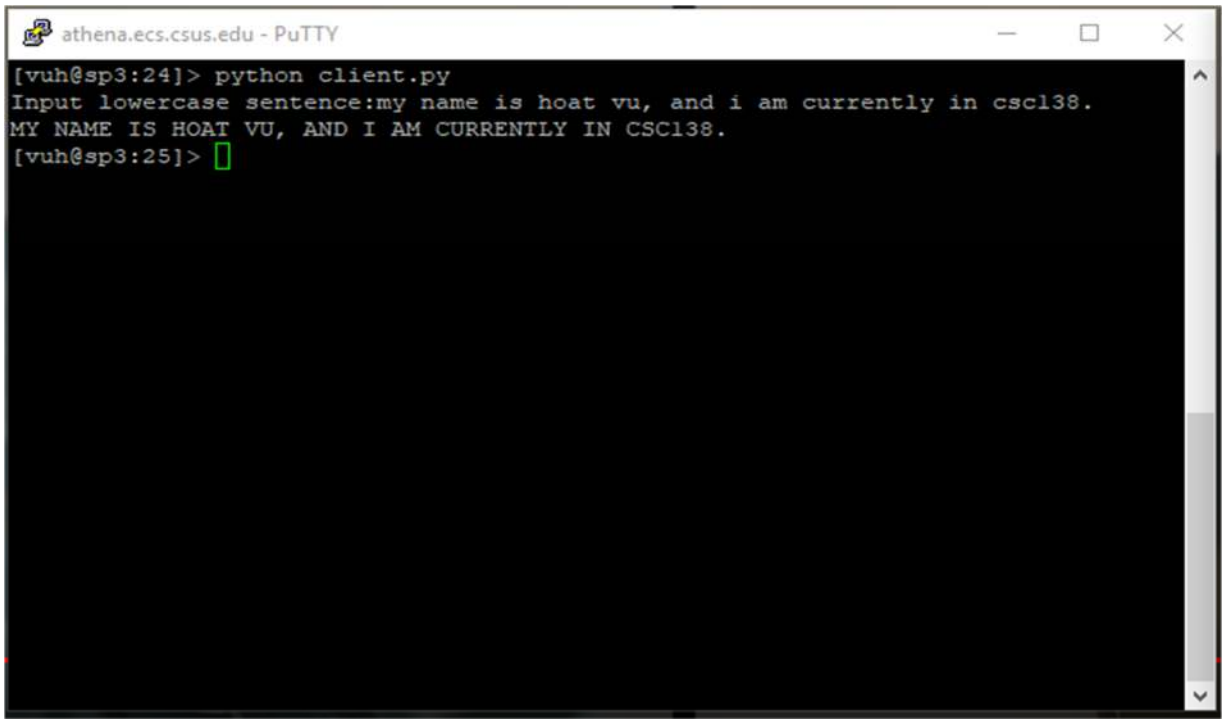

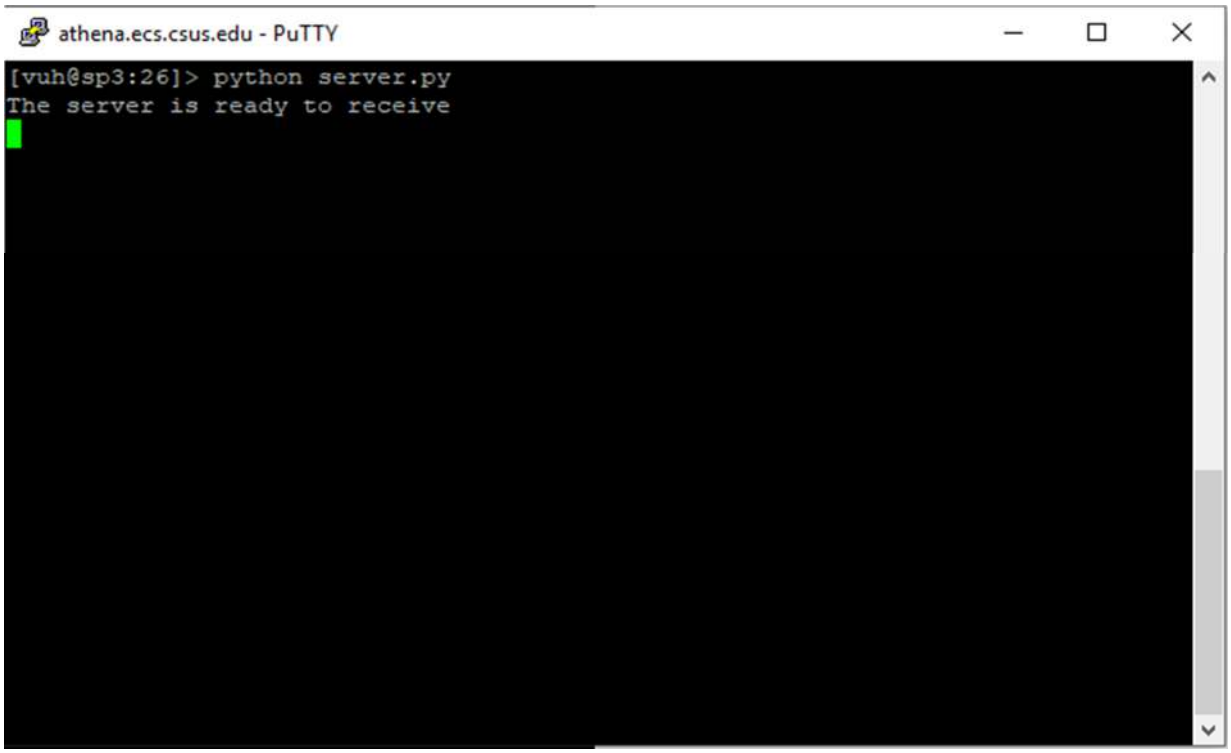

TCP server and client:
Note: it is important that the server must run first, then run the client. Otherwise, it will show up error when running the client.py.

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```
from socket import*

serverPort = 12000
serverSocket = socket(AF_INET, SOCK_STREAM)

serverSocket.bind(("", serverPort))
serverSocket.listen(1)

print("The server is ready to receive")

while True:
        connectionSocket, addr = serverSocket.accept()

        sentence = connectionSocket.recv(1024).decode()
        capitalizedSentence = sentence.upper()
        connectionSocket.send(capitalizedSentence.encode())


        connectionSocket.close()


~
~
"server.py" 21L, 421C                                 1,1           All
```

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```
from socket import*

serverName = 'sp3'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)

clientSocket.connect((serverName, serverPort))
sentence = raw_input('Input lowercase sentence:')

clientSocket.send(sentence.encode())
modifiedMessage = clientSocket.recv(1024)

print('From Server', modifiedMessage.decode())

clientSocket.close()
~
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~
~
~
~
"client.py" 15L, 351C                                 1,1           All
```

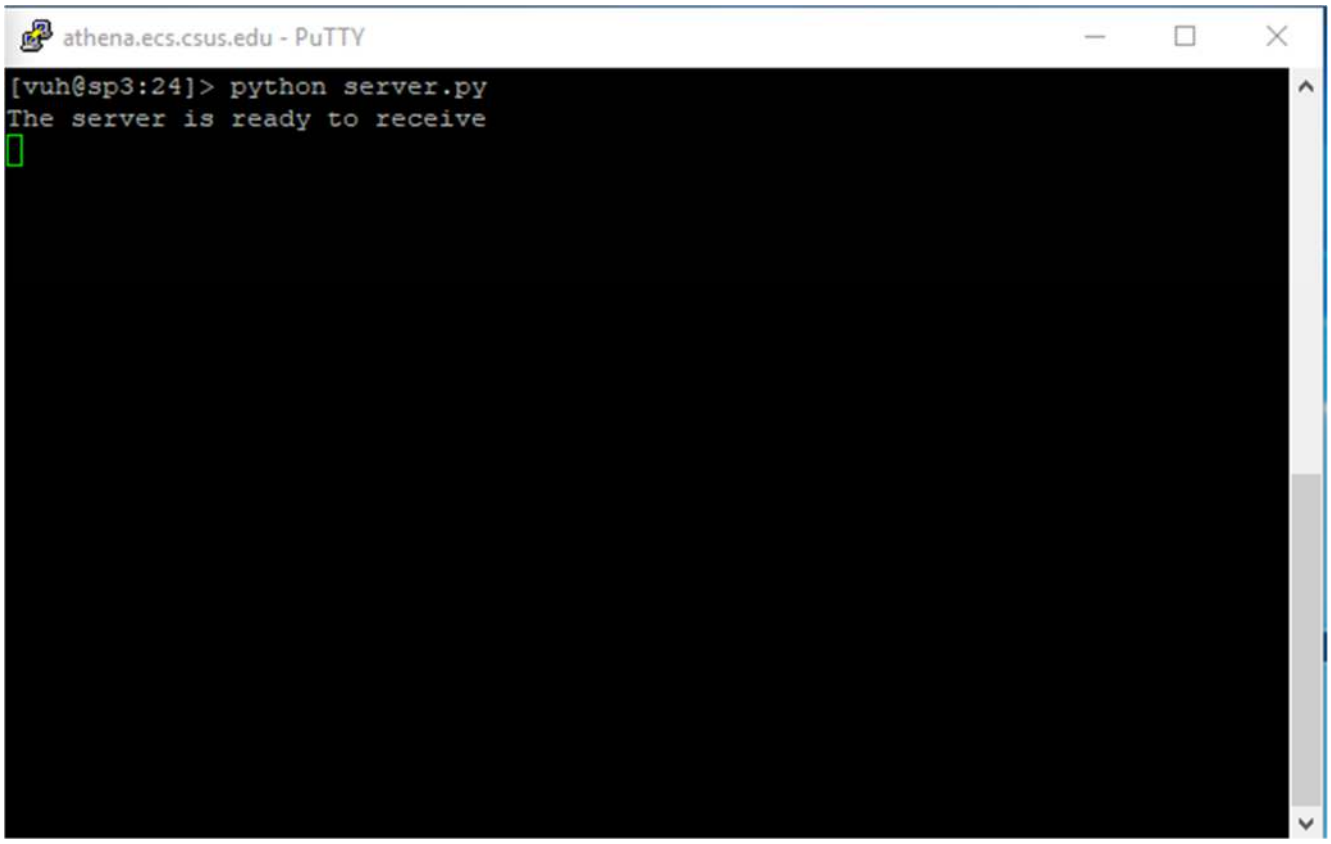
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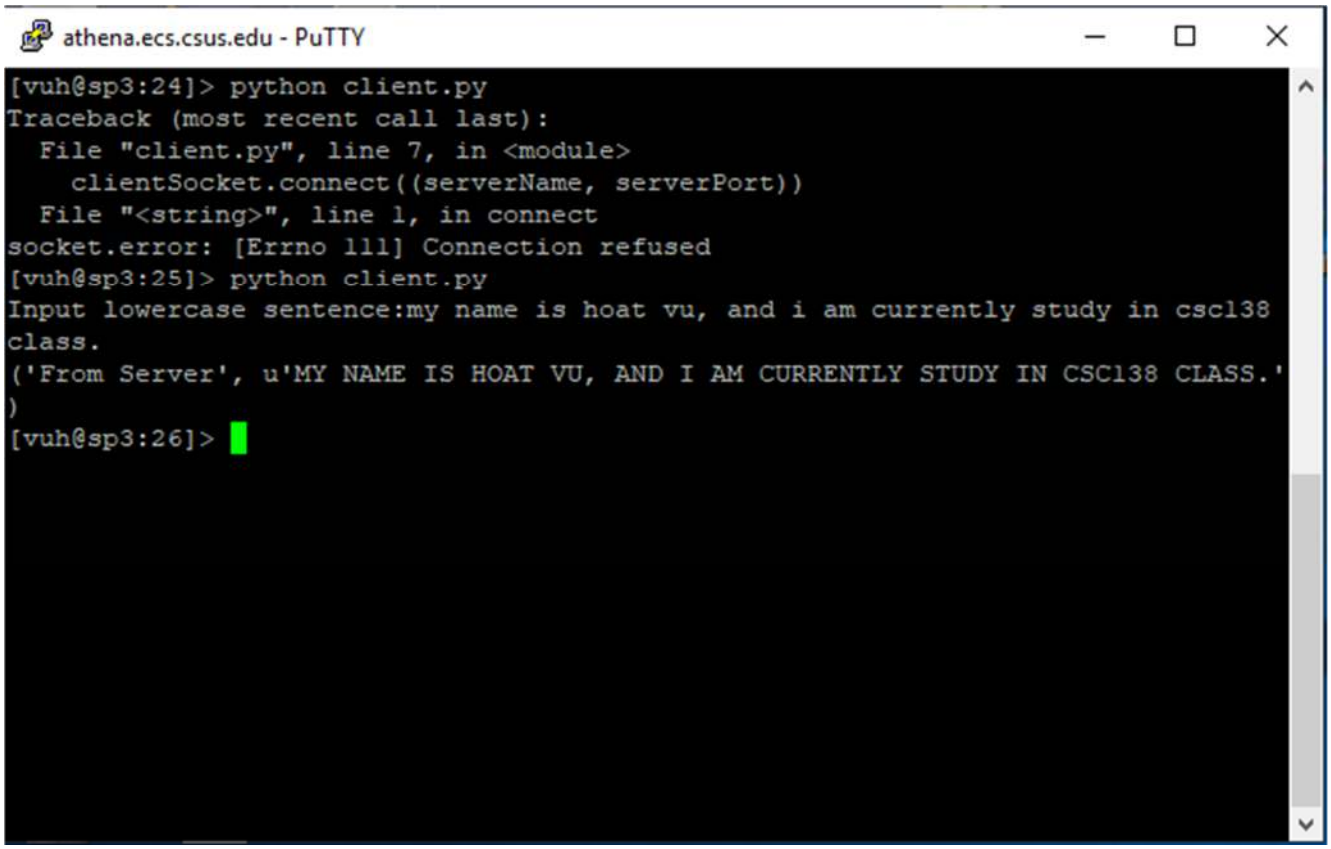
[vuh@sp3:24]> python server.py
The server is ready to receive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[vuh@sp3:24]> python client.py
Traceback (most recent call last):
File "client.py", line 7, in <module>
clientSocket.connect((serverName, serverPort))
File "<string>", line 1, in connect
socket.error: [Errno 111] Connection refused
[vuh@sp3:25]> python client.py
Input lowercase sentence:my name is hoat vu, and i am currently study in csc138
class.
('From Server', u'MY NAME IS HOAT VU, AND I AM CURRENTLY STUDY IN CSC138 CLASS.'
)
[vuh@sp3:26]>