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CS 436

Project1 Report  
DHCP Protocol

## **Running Instructions:**

Mac – I was able to run the program using terminal by typing:

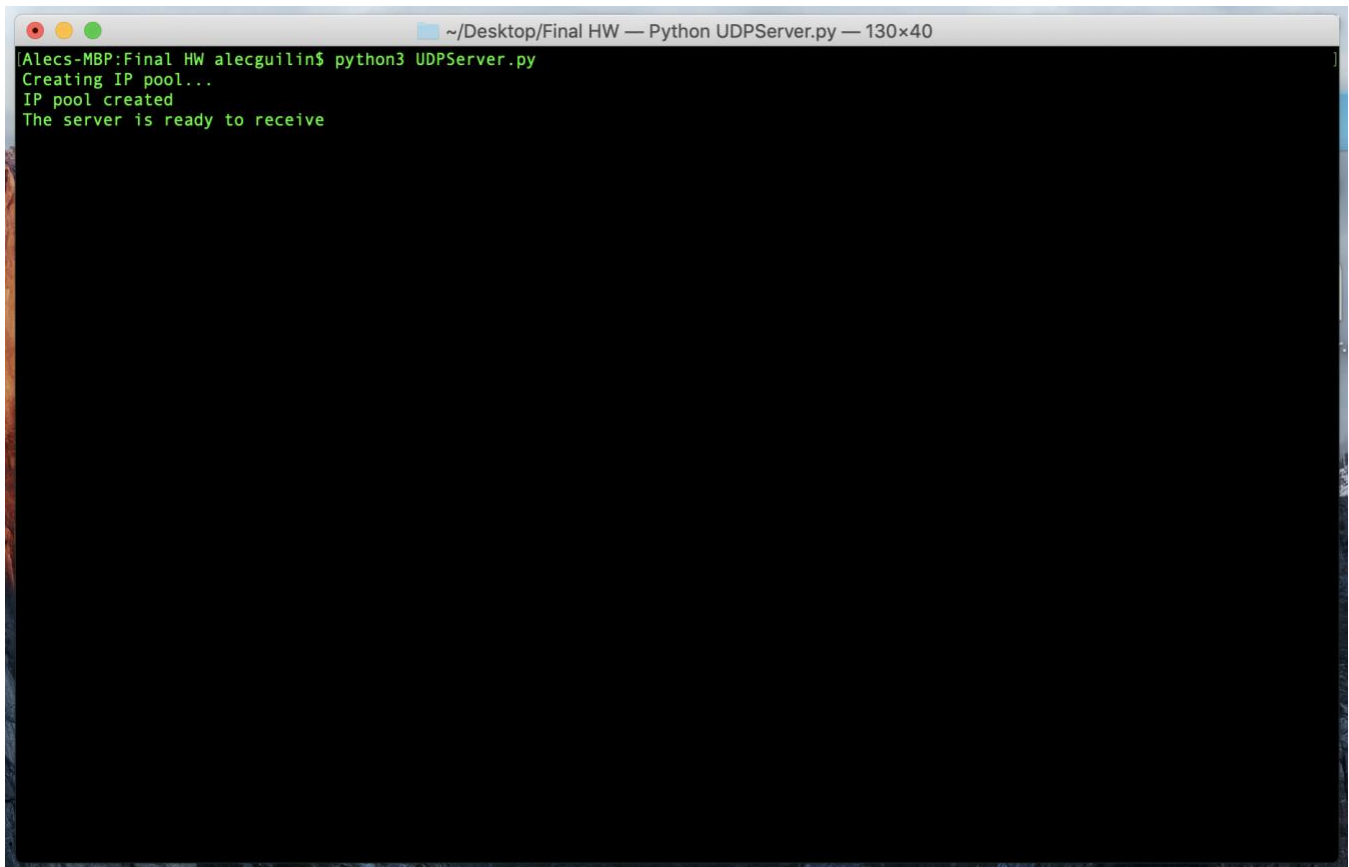
```
python3 UDPServer.py  
python3 UDPClient.py
```

Windows 10 –I was able to run the program using CMD by typing:

```
"File path of python executable" "File path of .py file"  
or  
Dragging python executable and .py file directly into CMD to  
automatically copy the file path
```

## Program Testing (excluding extra credit tests):

- 1) Run the server on computer1.



A screenshot of a macOS terminal window. The title bar at the top reads "~/Desktop/Final HW — Python UDPServer.py — 130x40". The terminal content shows the command `python3 UDPServer.py` being executed, followed by three lines of output: `Creating IP pool...`, `IP pool created`, and `The server is ready to receive`. The terminal background is black with green text.

```
Alecs-MBP:Final HW alecguilin$ python3 UDPServer.py
Creating IP pool...
IP pool created
The server is ready to receive
```

- 2) Run the client on computer2. Make sure that the client receives the first available IP address. The menu will be displayed for the client. Choose "quit".

```
Command Prompt
C:\Users\Alec>C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Client: DISCOVER msg is being sent...
Client: Current MAC address bc:5f:f4:e8:35:33 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: Checking if any IP's are available...
Server: IP available, sending OFFER msg...
Client: OFFER msg recieved...
Client: Server offered IP 192.168.1.1
Client: REQUEST msg is being sent...
Server: Recieved REQUEST msg...
Server: Checking if IP is still available...
Server: Storing MAC address bc:5f:f4:e8:35:33
Client: ACKNOWLEDGE msg recieved...
Client: IP Obtained: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 3
Quitting...

C:\Users\Alec>
```

- 3) Now we want to make sure that the same client cannot receive a new IP address from another terminal. Run the client on computer2. Make sure that the server verifies that the client already has an IP address x.x.x.x. The menu will be displayed for the client.

```
Command Prompt
Client: Current MAC address bc:5f:f4:e8:35:33 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: Checking if any IP's are available...
Server: IP available, sending OFFER msg...
Client: OFFER msg recieved...
Client: Server offered IP 192.168.1.1
Client: REQUEST msg is being sent...
Server: Recieved REQUEST msg...
Server: Checking if IP is still available...
Server: Storing MAC address bc:5f:f4:e8:35:33
Client: ACKNOWLEDGE msg recieved...
Client: IP Obtained: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 3
Quitting...

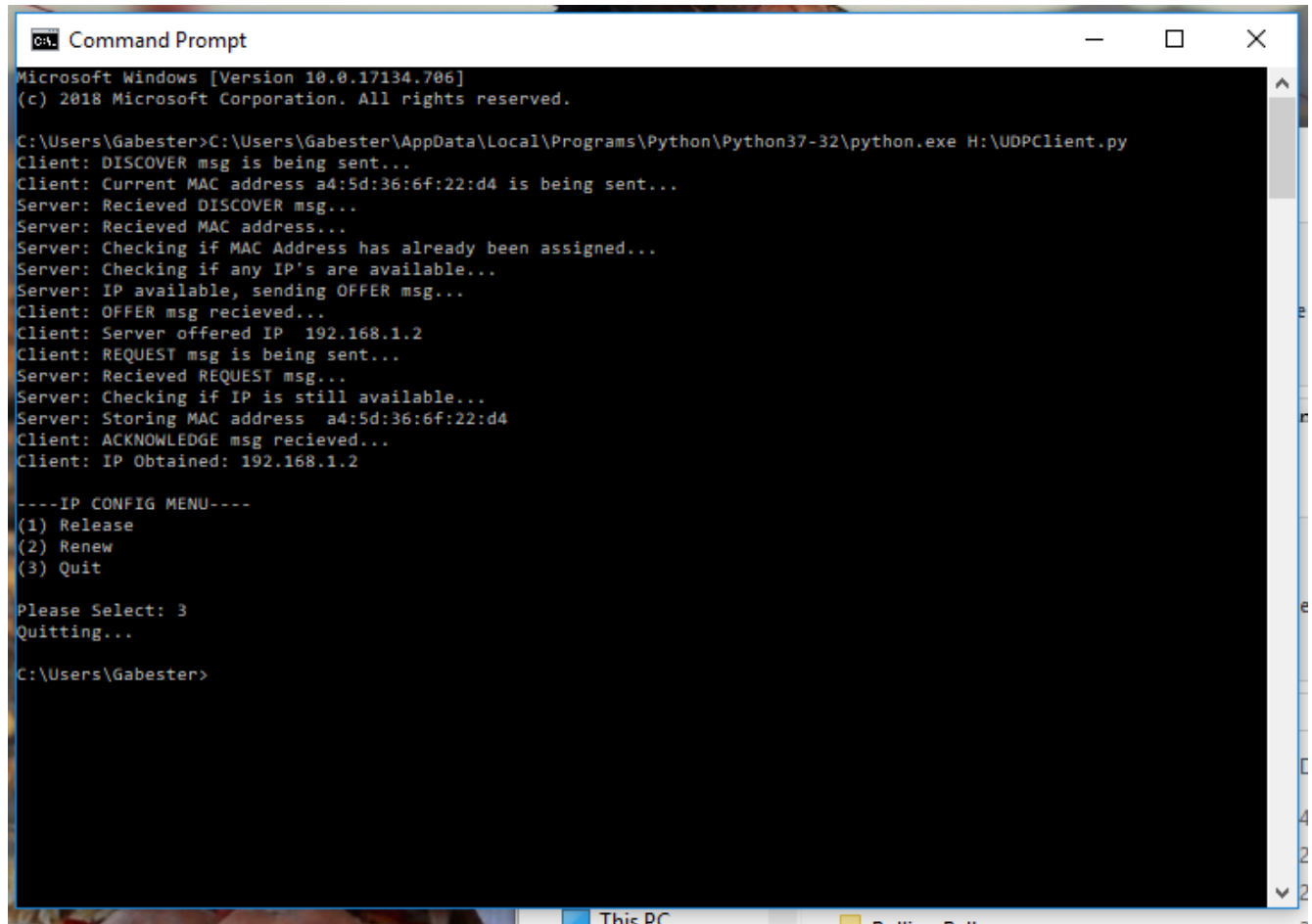
C:\Users\Alec>C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Client: DISCOVER msg is being sent...
Client: Current MAC address bc:5f:f4:e8:35:33 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: MAC address has already been assigned
Client: This machine has already been assigned an IP: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 3
Quitting...

C:\Users\Alec>
```

- 4) Run the client on computer3. Make sure that the client receives the next available IP address. The menu will be displayed for the client. Choose "quit".



```
Microsoft Windows [Version 10.0.17134.706]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Gabester>C:\Users\Gabester\AppData\Local\Programs\Python\Python37-32\python.exe H:\UDPCClient.py
Client: DISCOVER msg is being sent...
Client: Current MAC address a4:5d:36:6f:22:d4 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: Checking if any IP's are available...
Server: IP available, sending OFFER msg...
Client: OFFER msg recieved...
Client: Server offered IP 192.168.1.2
Client: REQUEST msg is being sent...
Server: Recieved REQUEST msg...
Server: Checking if IP is still available...
Server: Storing MAC address a4:5d:36:6f:22:d4
Client: ACKNOWLEDGE msg recieved...
Client: IP Obtained: 192.168.1.2

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 3
Quitting...

C:\Users\Gabester>
```

**\*\*NOTE:** I had to select the quit option after the previous step to be able to access from computer 3 without errors. However, it still correctly provides the next available IP in the IP pool.

- 5) On computer2, choose “release”. Make sure that the server releases the client’s IP address and replies the client. Then the client will display a proper message and the menu.

```
Command Prompt - C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: MAC address has already been assigned
Client: This machine has already been assigned an IP: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 3
Quitting...

C:\Users\Alec>C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Client: DISCOVER msg is being sent...
Client: Current MAC address bc:5f:f4:e8:35:33 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: MAC address has already been assigned
Client: This machine has already been assigned an IP: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 1
Client: Sending RELEASE msg to server...
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP successfully released back into pool.
Client: Sucessfully released IP.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select:
```

- 6) On computer2, again choose “release”. Make sure that the server verifies that the IP address has already been released and replies the client. Then the client displays a proper message and the menu.

```
Command Prompt - C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py

C:\Users\Alec>C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Client: DISCOVER msg is being sent...
Client: Current MAC address bc:5f:f4:e8:35:33 is being sent...
Server: Recieved DISCOVER msg...
Server: Recieved MAC address...
Server: Checking if MAC Address has already been assigned...
Server: MAC address has already been assigned
Client: This machine has already been assigned an IP: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 1
Client: Sending RELEASE msg to server...
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP successfully released back into pool.
Client: Sucessfully released IP.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 1
Client: Sending RELEASE msg to server...
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP release failed, not in list of current clients.
Client: Failed, IP already released.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select:
```

- 7) On computer2, choose “renew”. Make sure that the server assigns the same IP address as before to the client and replies the client. Then the client displays a proper message and the menu. Choose “quit”.

```
Command Prompt - C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP successfully released back into pool.
Client: Sucessfully released IP.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 1
Client: Sending RELEASE msg to server...
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP release failed, not in list of current clients.
Client: Failed, IP already released.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 2
Client: Sending RENEW msg to server...
Server: Recieves RENEW msg...
Server: Attempting to rewnew IP...
Server: Assigning new IP...
Server: Sending OFFER msg...
Client: Recieves OFFER msg from server...
Client: Sends REQUEST msg to server...
Server: Recieves REQUEST msg...
Server: Sending ACKNOWLEDGE msg...
Client: Recieves ACKNOWLEDGE msg...
Client: IP Obtained: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select:
```



## 8) Selecting "renew" option again.

```
Command Prompt - C:\Users\Alec\AppData\Local\Programs\Python\Python37-32\python.exe G:\Users\Alec\Desktop\UDPCClient.py
Server: Recieves RELEASE msg to server...
Server: Attempting to release IP...
Server: IP release failed, not in list of current clients.
Client: Failed, IP already released.

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 2
Client: Sending RENEW msg to server...
Server: Recieves RENEW msg...
Server: Attempting to rewnew IP...
Server: Assigning new IP...
Server: Sending OFFER msg...
Client: Recieves OFFER msg from server...
Client: Sends REQUEST msg to server...
Server: Recieves REQUEST msg...
Server: Sending ACKNOWLEDGE msg...
Client: Recieves ACKNOWLEDGE msg...
Client: IP Obtained: 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: 2
Client: Sending RENEW msg to server...
Server: Recieves RENEW msg...
Server: Attempting to rewnew IP...
Server: IP already assigned.
Client: IP is already assigned, IP is 192.168.1.1

----IP CONFIG MENU----
(1) Release
(2) Renew
(3) Quit

Please Select: _
```