Task 1.1 step 1

```
Command Prompt
Microsoft Windows [Version 10.0.19044.2486]
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C:\Users\Robby>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 2:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::b9ca:8b72:1de3:2588%42
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 13:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 14:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```
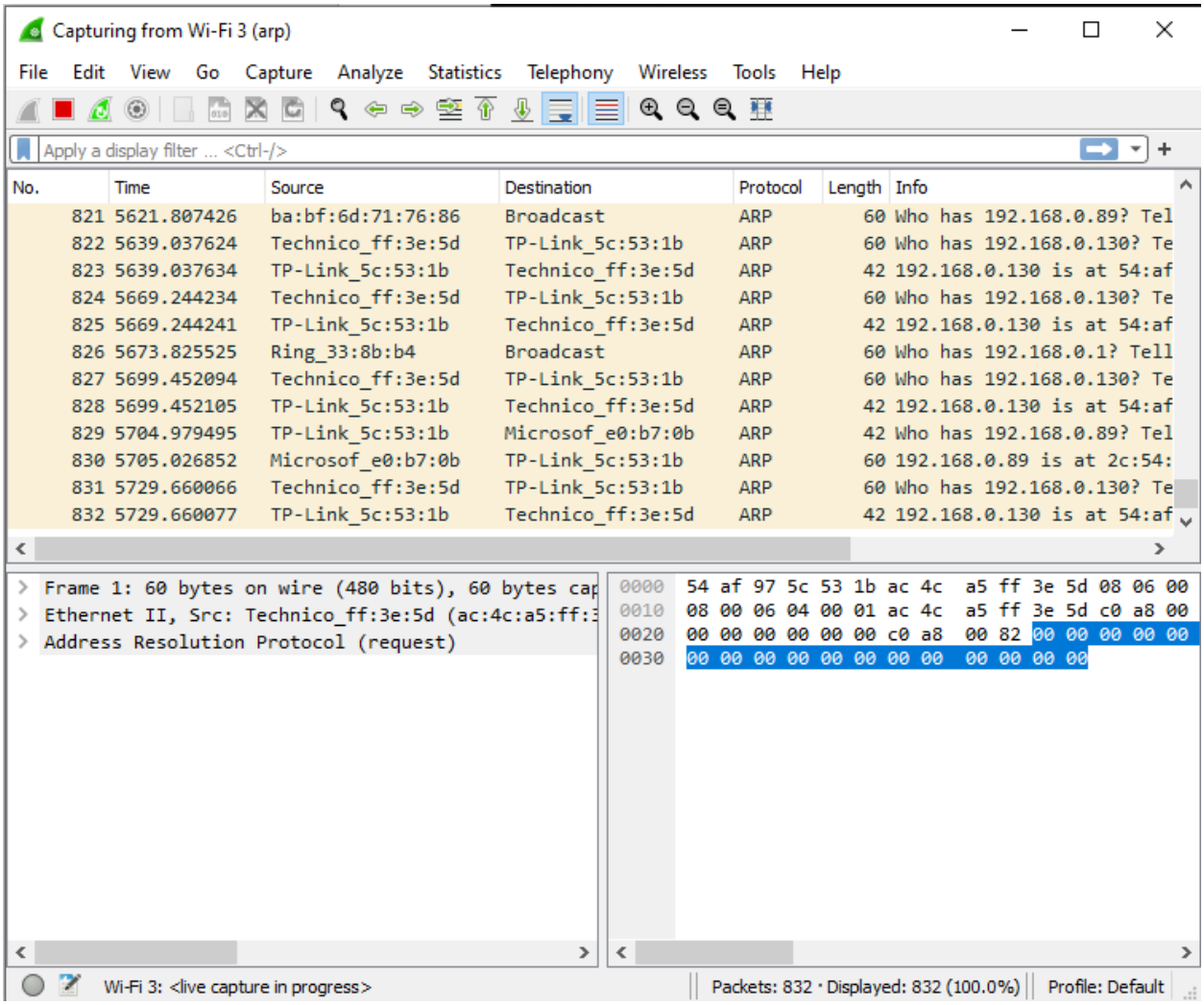

```
IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0      192.168.0.1    192.168.0.130     35
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    331
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    331
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    331
      192.168.0.0    255.255.255.0         On-link     192.168.0.130    291
    192.168.0.130  255.255.255.255         On-link     192.168.0.130    291
    192.168.0.255  255.255.255.255         On-link     192.168.0.130    291
     192.168.56.0    255.255.255.0         On-link      192.168.56.1    330
     192.168.56.1  255.255.255.255         On-link      192.168.56.1    330
   192.168.56.255  255.255.255.255         On-link      192.168.56.1    330
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    331
        224.0.0.0        240.0.0.0         On-link      192.168.56.1    330
        224.0.0.0        240.0.0.0         On-link     192.168.0.130    291
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    331
  255.255.255.255  255.255.255.255         On-link      192.168.56.1    330
  255.255.255.255  255.255.255.255         On-link     192.168.0.130    291
===========================================================================
Persistent Routes:
  None
```


Capturing from Wi-Fi 3 (arp)
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
821 5621.807426 ba:bf:6d:71:76:86 Broadcast ARP 60 Who has 192.168.0.89? Tel
822 5639.037624 Technico_ff:3e:5d TP-Link_5c:53:1b ARP 60 Who has 192.168.0.130? Te
823 5639.037634 TP-Link_5c:53:1b Technico_ff:3e:5d ARP 42 192.168.0.130 is at 54:af
824 5669.244234 Technico_ff:3e:5d TP-Link_5c:53:1b ARP 60 Who has 192.168.0.130? Te
825 5669.244241 TP-Link_5c:53:1b Technico_ff:3e:5d ARP 42 192.168.0.130 is at 54:af
826 5673.825525 Ring_33:8b:b4 Broadcast ARP 60 Who has 192.168.0.1? Tell
827 5699.452094 Technico_ff:3e:5d TP-Link_5c:53:1b ARP 60 Who has 192.168.0.130? Te
828 5699.452105 TP-Link_5c:53:1b Technico_ff:3e:5d ARP 42 192.168.0.130 is at 54:af
829 5704.979495 TP-Link_5c:53:1b Microsof_e0:b7:0b ARP 42 Who has 192.168.0.89? Tel
830 5705.026852 Microsof_e0:b7:0b TP-Link_5c:53:1b ARP 60 192.168.0.89 is at 2c:54:
831 5729.660066 Technico_ff:3e:5d TP-Link_5c:53:1b ARP 60 Who has 192.168.0.130? Te
832 5729.660077 TP-Link_5c:53:1b Technico_ff:3e:5d ARP 42 192.168.0.130 is at 54:af
Frame 1: 60 bytes on wire (480 bits), 60 bytes cap
Ethernet II, Src: Technico_ff:3e:5d (ac:4c:a5:ff:3
Address Resolution Protocol (request)
0000 54 af 97 5c 53 1b ac 4c a5 ff 3e 5d 08 06 00
0010 08 00 06 04 00 01 ac 4c a5 ff 3e 5d c0 a8 00
0020 00 00 00 00 00 00 c0 a8 00 82 00 00 00 00 00
0030 00 00 00 00 00 00 00 00 00 00 00 00
Wi-Fi 3: <live capture in progress>
Packets: 832 · Displayed: 832 (100.0%)
Profile: Default

Address before arp -d

Address no longer available after arp -d

```
Administrator: Command Prompt
  > arp -a                                  .... Displays the arp table.

C:\Windows\system32>arp -a

Interface: 192.168.0.130 --- 0x2
  Internet Address      Physical Address      Type
  192.168.0.1           ac-4c-a5-ff-3e-5d     dynamic
  192.168.0.12          b0-f7-c4-9b-0b-b3     dynamic
  192.168.0.46          08-84-9d-c4-4a-cb     dynamic
  192.168.0.85          8c-49-62-b6-a4-6e     dynamic
  192.168.0.89          2c-54-91-e0-b7-0b     dynamic
  192.168.0.188         2c-64-1f-28-19-06     dynamic
  192.168.0.255         ff-ff-ff-ff-ff-ff     static
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.3.22          01-00-5e-7f-03-16     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  239.255.255.251       01-00-5e-7f-ff-fb     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.56.1 --- 0x10
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff     static
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.3.22          01-00-5e-7f-03-16     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  239.255.255.251       01-00-5e-7f-ff-fb     static

C:\Windows\system32>arp -d

C:\Windows\system32>arp -a

Interface: 192.168.0.130 --- 0x2
  Internet Address      Physical Address      Type
  192.168.0.1           ac-4c-a5-ff-3e-5d     dynamic
  192.168.0.46          08-84-9d-c4-4a-cb     dynamic
  192.168.0.85          8c-49-62-b6-a4-6e     dynamic
  192.168.0.188         2c-64-1f-28-19-06     dynamic
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.3.22          01-00-5e-7f-03-16     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  239.255.255.251       01-00-5e-7f-ff-fb     static

Interface: 192.168.56.1 --- 0x10
  Internet Address      Physical Address      Type
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  239.255.3.22          01-00-5e-7f-03-16     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  239.255.255.251       01-00-5e-7f-ff-fb     static

C:\Windows\system32>sudo arp -d 192.168.0.1 arp -a
```

```
228 1036.434839   Ring_33:8b:b4   Broadcast   ARP   60 Who has 192.168.0.1? Tell 192.168.0.92
```

Step 2

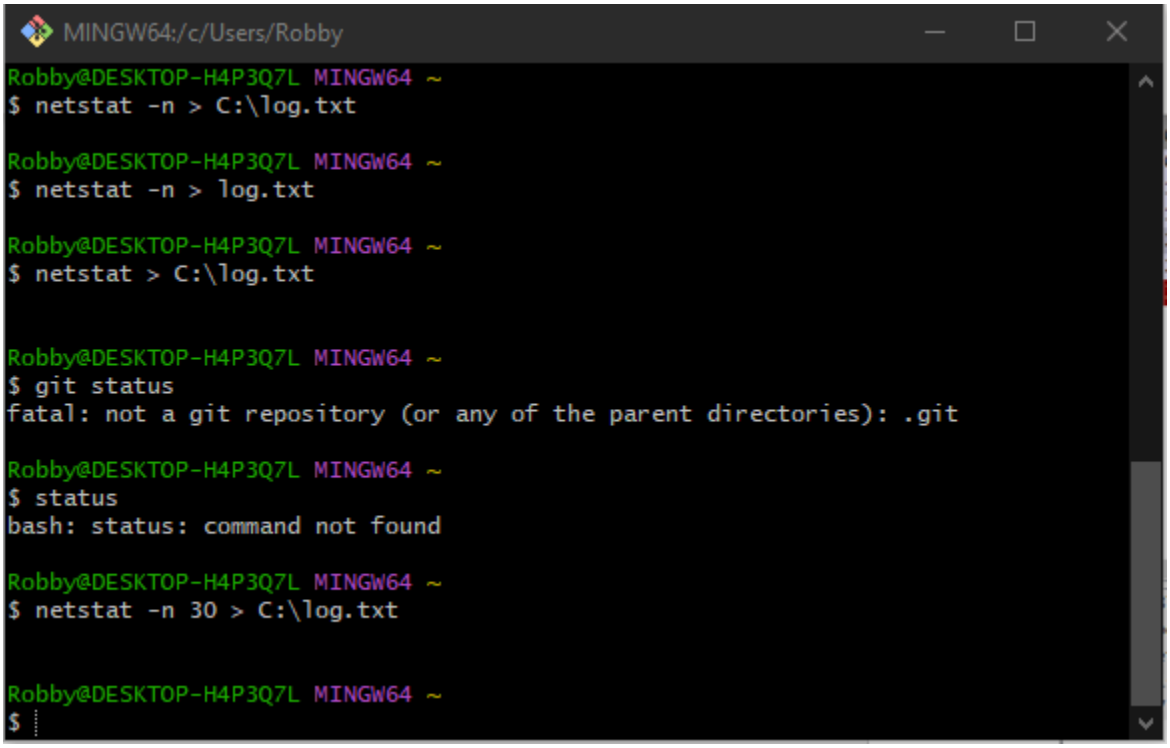
```
> Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface \Device\NPF_{06C3E17F-78B4-4E12-9529-
> Ethernet II, Src: Technico_ff:3e:5d (ac:4c:a5:ff:3e:5d), Dst: TP-Link_5c:53:1b (54:af:97:5c:53:1b)
v Address Resolution Protocol (request)
    Hardware type: Ethernet (1)
    Protocol type: IPv4 (0x0800)
    Hardware size: 6
    Protocol size: 4
    Opcode: request (1)
    Sender MAC address: Technico_ff:3e:5d (ac:4c:a5:ff:3e:5d)
    Sender IP address: 192.168.0.1
    Target MAC address: 00:00:00_00:00:00 (00:00:00:00:00:00)
    Target IP address: 192.168.0.130
```

```
> Frame 2: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface \Device\NPF_{06C3E17F-78B4-4E12-9529-
> Ethernet II, Src: TP-Link_5c:53:1b (54:af:97:5c:53:1b), Dst: Technico_ff:3e:5d (ac:4c:a5:ff:3e:5d)
v Address Resolution Protocol (reply)
    Hardware type: Ethernet (1)
    Protocol type: IPv4 (0x0800)
    Hardware size: 6
    Protocol size: 4
    Opcode: reply (2)
    Sender MAC address: TP-Link_5c:53:1b (54:af:97:5c:53:1b)
    Sender IP address: 192.168.0.130
    Target MAC address: Technico_ff:3e:5d (ac:4c:a5:ff:3e:5d)
    Target IP address: 192.168.0.1
```

Step 3

1. for a request opcode 1. A reply is opcade 2
2. according to https://kevincurran.org/com320/labs/wireshark/lab-arp.pdf , the ARP header contains 28 bytes for both the header and the reply.
3. 00:00:00_00:00:00
4. The hex value for upper level protocol is (0x0806)

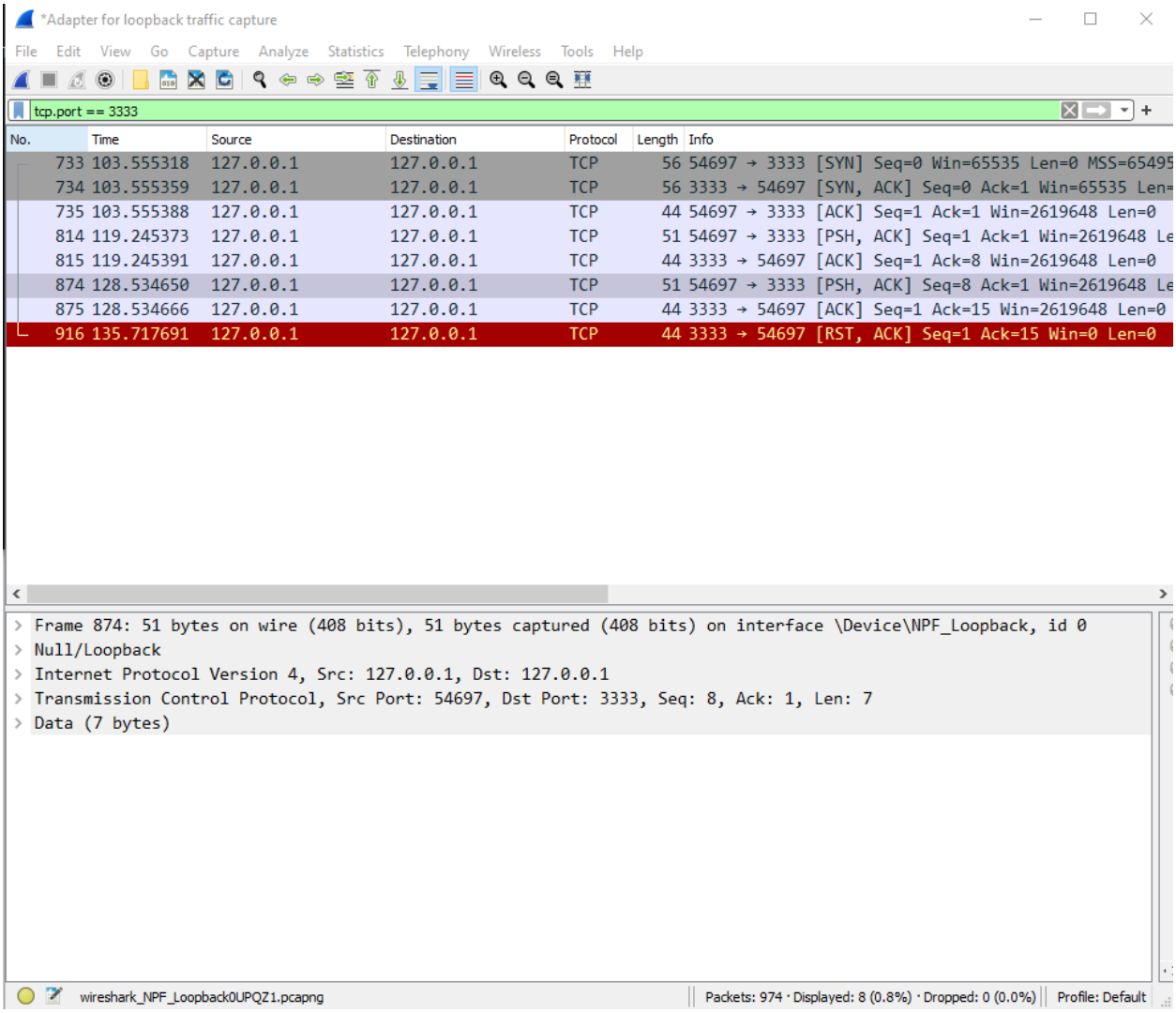
Task 1.2



I wasn't able to run the watch command or the grep command. So I decided for the sake of finishing the assignment to run the above command and set a timer for 10 minutes. The extracted txt file I attempted to import into excel, but it didn't import correctly and I was unable to create a graph from the results. I will also be attaching the txt file to the submission on canvas.

Task 1.3

Step 1:

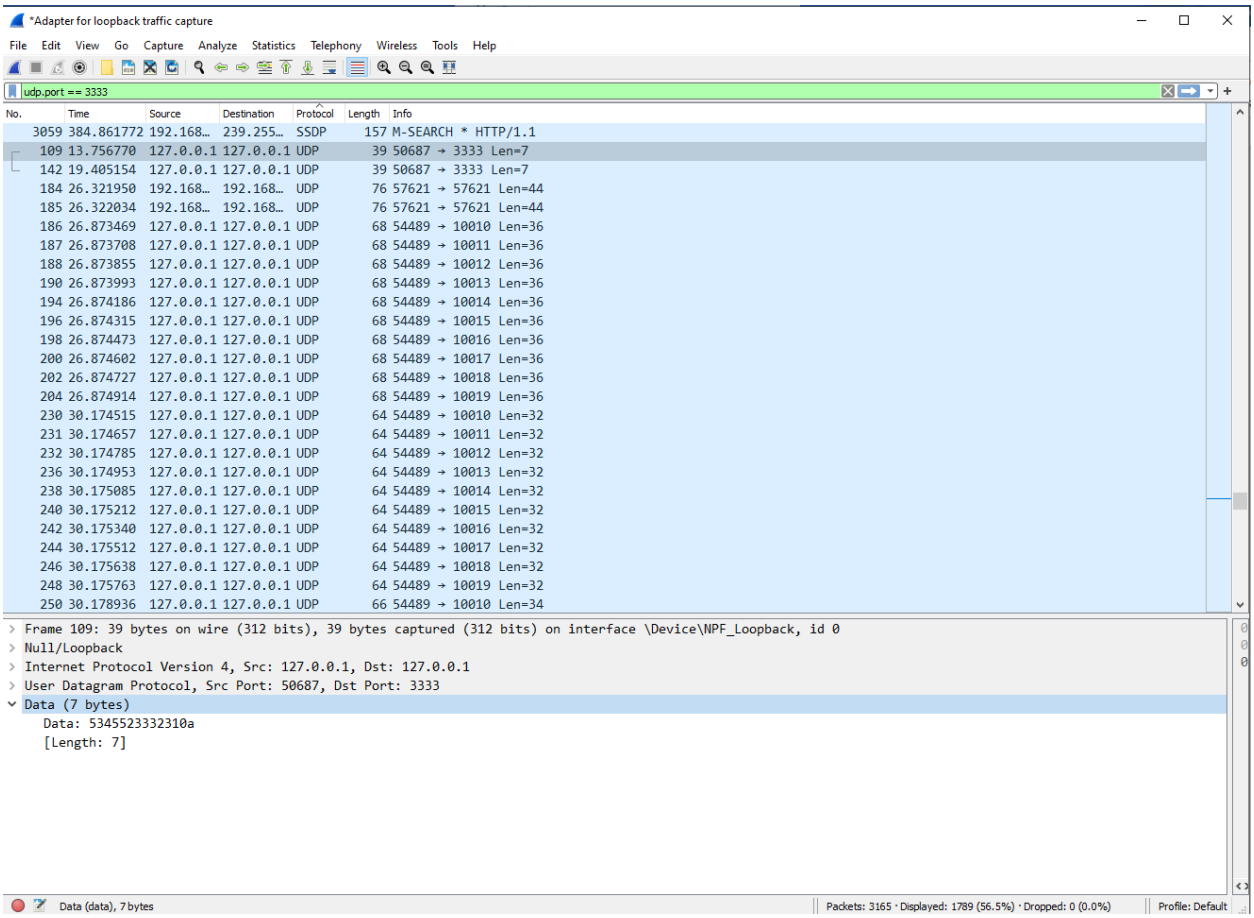


Answers:

a) Both commands used were given in the assignment document. The first command used was ncat -k -l 3333. This sets up the monitoring system for the computer specifically at the port 3333. The -k allows it to accept multiple connections in listen mode and the -l binds the ncat and listens for incoming connections. The second command used was ncat 127.0.0.1 3333. This command has the computer connect to a specific address with a specific port. The port for the 1st and second command are the same. The second command is used to send data that will then be picked up by 1st command.
b) According to wireshark, 3 frames. Frames 733,734,735
c) Adding up the packet length given of the three frames yields 156 bytes
d) According to wireshark, the entire process needed 974 bytes.
e) It totaled 14 bytes

f) Im not sure if I used the wrong data for this one or answer c, but it also shows 974 bytes
g) We had 14 bytes of data transferred manually, 960 bytes of data was sent automatically.

Step 2:



a) The commands are very similar to the ones used in the first part however this one uses UDP instead of TCP. I also had to get rid of the -k as it wouldn't allow me to use the command with it.
b) To be honest, im not really sure. My UDP readings seemed to have more than just my program running through it.
c) Im not sure
d) According to wireshark 1536 bytes
e) Im not sure
f) If it was the same as before it should be about 14 bytes
g) Well if my readings are correct(which more than likely they are not) it would mean that we only sent 14 bytes while the system went through about 1500 bytes
h) It looks like the data that they show is around the same its just structured differently. Udp seems to spread out its information whereas TCP is more consolidated.

Task 1.4

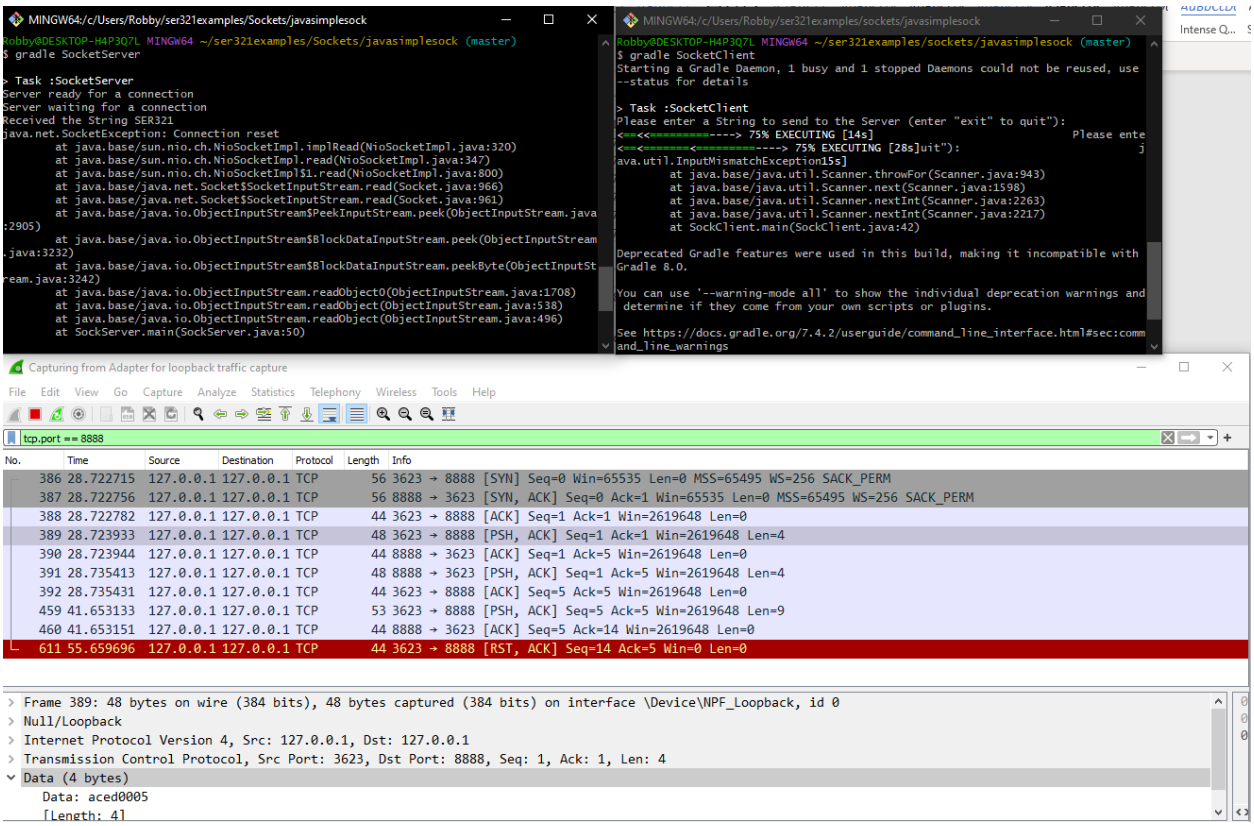
#	Country	Town	Lat	Lon	IP	Hostname	Latency (r	DNS Look	Distance t
1	United St	Mesa	33.4393	-111.77	2600:8800	(None)	3	995	0
2	United St	(Unknowı	37.751	-97.822	2600:8800	(None)	18	22	1349
3	*	*	37.751	-97.822	*	*	0	0	0
4	United St	(Unknowı	37.751	-97.822	2001:578:	(None)	11	21	0
5	United St	(Unknowı	37.751	-97.822	2001:578:	(None)	24	61	0
6	United St	(Unknowı	37.751	-97.822	2620:11a:	(None)	21	71	0
7	United St	(Unknowı	37.751	-97.822	2a04:4e42	(None)	24	16	0

#	Country	Town	Lat	Lon	IP	Hostname	Latency (r	DNS Look	Distance t
1	United St	Los Angel	34.0544	-118.244	199.232.9	(None)	27	10004	0

Answers: it looks like the fastest was the one I did off my home network. When I connected to a public network, it was as if it didn't work or just needed the one IP address to work. The Second one on the public network seemed to have the fewest loops assuming the program worked correctly.

Task 1.5

1.5.1:



1.5.2: As far as gradle goes, I did have to make changes to the client host as I had to change the host from local to the AWS server IP address.

1.5.3: it would not work automatically. You would first need to make sure that the AWS client class has the correct information in order to access the local Server. this would include the correct server port and host.

1.5.4: in order to access the local server from an outside client AWS class, the AWS client would need the local IP address of the server at the very least to be able to connect to the modem running the server. the client would also then need to have the correct access information including the host and the socket number. Otherwise it would not work.

https://drive.google.com/file/d/1zDBTFkSqz3HvPAX2wfkY4qIeiCBTQ4Wp/view?usp=share_link