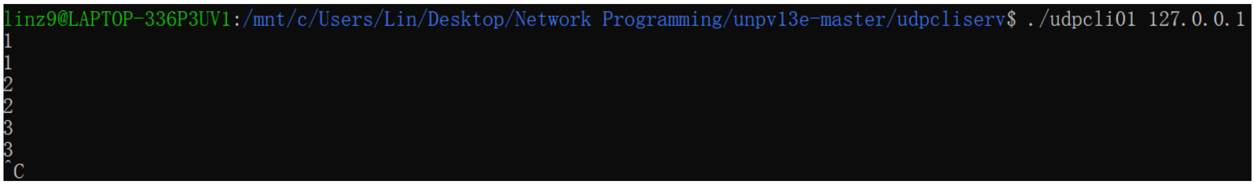
Initial Capture:

1.Write down how many different protocols are visible with the filter active.

There are 4 different protocols, udp, udpcp, udpencap, udplite.

2.Also write down how many UDP datagrams should your program have sent, and how many should it have received.

There should be 3 packets my program has sent, and 3 packets my program should have received.



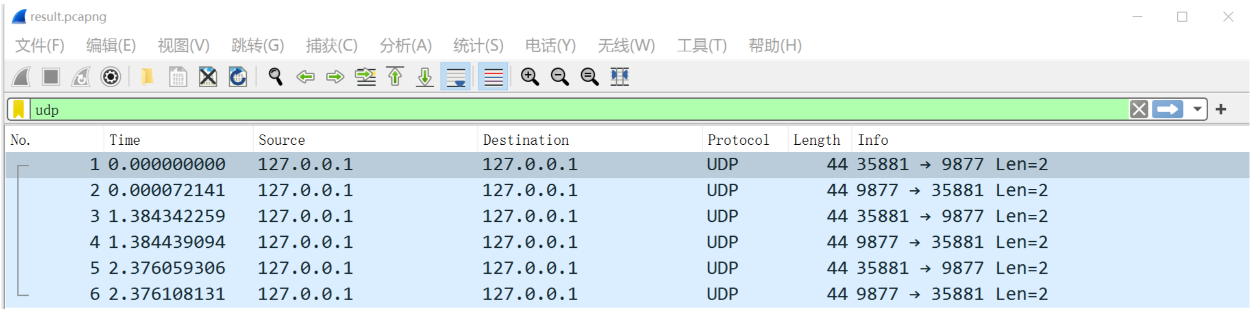
```
linz9@LAPTOP-336P3UV1:/mnt/c/Users/Lin/Desktop/Network Programming/unpv13e-master/udpcliserv$ ./udpcli01 127.0.0.1
1
1
2
2
3
3
^C
```

How many datagrams in Wireshark appear to be from either your udpserv01 or udpcli01 programs?

0.

Switching to Loopback:

There are totally 6 packets.



udp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	127.0.0.1	127.0.0.1	UDP	44	35881 → 9877 Len=2
2	0.000072141	127.0.0.1	127.0.0.1	UDP	44	9877 → 35881 Len=2
3	1.384342259	127.0.0.1	127.0.0.1	UDP	44	35881 → 9877 Len=2
4	1.384439094	127.0.0.1	127.0.0.1	UDP	44	9877 → 35881 Len=2
5	2.376059306	127.0.0.1	127.0.0.1	UDP	44	35881 → 9877 Len=2
6	2.376108131	127.0.0.1	127.0.0.1	UDP	44	9877 → 35881 Len=2

Examining Packet Contents:

1. What was the port number on the client side?

    35881

2. What was the port number on the server side?

    9877

3. How large is the UDP header?

    8 bytes

4. How large is the application data? (Answer this for just one of your packets)

    2 bytes

5. How large are all the headers in one packet? Give just a single total number. (Answer this for any one of your packets)

    42 bytes

Internet Checksums:

1. UDP header: 8c 29 26 95 00 0a fe 1d
2. Data: 31 0a
3. Source and Destination address: 7f 00 00 01
4. UDP length: 00 0a(10)
5. Protocol number: 00 11

8c 29 + 26 95 = b2 be ⇒ b2 be + 00 0a = b2 c8 ⇒ b2 c8 + 00 00 = b2 c8
⇒ b2 c8 + 31 0a = e3 d2 ⇒ e3 d2 + 7f 00 = 1 62 d2 -> 62 d3 ⇒ 62 d3 + 00 01 = 62 d4
⇒ 62 d4 + 7f 00 = e1 d4 ⇒ e1 d4 + 00 01 = e1 d5 ⇒ e1 d5 + 00 0a = e1 df
⇒ e1 df + 00 11 = e1 f0
After taking 1's complement ⇒ 1e 0f

1e 0f + e1 f0 = ffff

The checksum I calculate does not match the checksum in the datagram.
It might be due to “checksum offloading”.