1. What IPv4 protocol does YouTube use for video streaming? Can you justify this design choice of engineers at YouTube?

`Internet Protocol Version 4, Protocol: TCP`

YouTube uses Transmission Control Protocol for video streaming. A YouTube user expects to access as well as high quality and smoothly flowed videos. TCP also allows the video to traverse firewalls and NATs more easily (because they are configured to block most of UDP traffics). Finally, TCP provides slow start, transmit pacing, exponential back off, receive windows, reordering, duplicate rejection and so on. So, TCP meets YouTube needs more efficient way; this is the best choice to select TCP for video streaming.

2. What is your computer's IP address, YouTube's IP address and ceng.metu.edu.tr's IP address?

My computer's IP address -->192.168.42.95

YouTube's IP address --> 172.217.17.206

ceng.metu.edu.tr's IP address --> 144.122.171.44

3.What is the destination and source ports for the GET requests made to ceng.metu.edu.tr? Draw a table.

```
24778 52.580475957  192.168.42.95    144.122.171.44    HTTP    412 GET
24807 52.695092557  192.168.42.95    144.122.171.44    HTTP    405 GET
24808 52.697844559  192.168.42.95    144.122.171.44    HTTP    410 GET
24886 52.777504817  192.168.42.95    144.122.171.44    HTTP    327 GET
```

Frame No	Source Port	Destination Port
24778	42782	80
24807	42784	80
24808	42782	80
24886	42784	80

4. What are the Numbers of packets in the first 3-Way handshake with the ceng.metu.edu.tr? What are their sequence and ack numbers?

```
24763 52.529266740  192.168.42.95    144.122.171.44    TCP    74 42782 → 80 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=3027900 TSecr=0 WS=128
24776 52.580272247  144.122.171.44   192.168.42.95     TCP    74 80 → 42782 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1400 SACK_PERM=1 TSval=2355342700 TSecr=3027900 WS=64
24777 52.580302590  192.168.42.95    144.122.171.44    TCP    66 42782 → 80 [ACK] Seq=1 Ack=1 Win=29312 Len=0 TSval=3027913 TSecr=2355342700
```

Frame No	Seq. No	Ack. No
24763	0	0
24776	0	1
24777	1	1

Number of packets -->3

5. What are the packet numbers and segment numbers of the first 5 packets of all packets transmitting the image 'ceng.png'? What is the length of each segment used to transmit the image?

```
[Frame: 25893, payload: 0-1387 (1388 bytes)]
[Frame: 25895, payload: 1388-2775 (1388 bytes)]
[Frame: 25897, payload: 2776-4163 (1388 bytes)]
[Frame: 25899, payload: 4164-5551 (1388 bytes)]
[Frame: 25903, payload: 5552-6939 (1388 bytes)]
```

Packet No	Seq. No	Lenght
25893	4043	1388 bytes
25895	5431	1388 bytes
25897	6819	1388 bytes
25899	8207	1388 bytes
25903	9595	1388 bytes

6.What is the minimum amount of available buffer space advertised at the receiver for the entire trace? Does the lack of receiver buffer space ever throttle the sender?

237.Yes.