

11 – Whether or not the sequence of intermediate routers is the same in different trace files:

A: No - Group Trace 1
A: Yes - Group Trace 2

12 – If the answer to 11 is no, "list the difference and explain why"
If the answer to 11 is yes, list a table as specified in Section 3.2 of the assignment

GROUP1

The table for group 1 outlines the difference - relative to group-trace1

Intermediate Routers	group1-trace1	group1-trace2	group1-trace3	group1-trace4	group1-trace5
1	142.104.68.167	142.104.68.167	142.104.68.167	142.104.68.167	142.104.68.167
2	142.104.68.1	142.104.68.1	142.104.68.1	142.104.68.1	142.104.68.1
3	192.168.9.5	192.168.9.5	192.168.9.5	192.168.9.5	192.168.9.5
4	192.168.10.1	192.168.10.1	192.168.10.1	192.168.10.1	192.168.10.1
5	192.168.8.6	192.168.8.6	192.168.8.6	192.168.8.6	192.168.8.6
6	142.104.252.37	142.104.252.37	142.104.252.37	142.104.252.37	142.104.252.37
7	142.104.252.246	142.104.252.246	142.104.252.246	142.104.252.246	142.104.252.246
8	207.23.244.242	207.23.244.242	207.23.244.242	207.23.244.242	207.23.244.242
9	206.12.3.17	206.12.3.17	206.12.3.17	206.12.3.17	206.12.3.17
10	199.212.24.64	199.212.24.64	199.212.24.64	199.212.24.64	199.212.24.64
11	206.81.80.17	206.81.80.17	206.81.80.17	206.81.80.17	206.81.80.17
12	74.125.37.91	72.14.237.123	74.125.37.91	74.125.37.91	72.14.237.123
13	72.14.237.123	74.125.37.91	72.14.237.123	72.14.237.123	209.85.250.59
14	209.85.250.121	209.85.249.109	209.85.245.65	209.85.246.219	209.85.249.153
15	209.85.249.155	209.85.250.57	209.85.249.155	209.85.250.123	209.85.247.61
16	209.85.249.153	209.85.246.219	209.85.247.63	209.85.245.65	

Green - represents the same throughout

Yellow - represents a group that has the same IPs yet in a slightly different order

Red - represents a unique group of IPs not found elsewhere in the row

Notably, router 13 (TTL) trace1-4 is seemingly “missing” in trace5, effectively shifting the results.

Q: Why is it different?

Routers have their policies when handling which router to propagate next to. Sometimes it can be a local preference, it is for security/speed, closed connection, a previous path is congested etc.. No policy is considered globally optimum, nor do they look for one, hence there may be different paths depending on the current conditions and time.

12 – If the answer to 11 is no, "list the difference and explain why"

If the answer to 11 is yes, list a table as specified in Section 3.2 of the assignment

GROUP2

The table for group 2 outlines the average RTT for each hop

TTL	Average RTT in trace 1	Average RTT in trace 2	Average RTT in trace 3	Average RTT in trace 4	Average RTT in trace 5	AVG for TTL
1	3.32967ms	2.71067ms	7.854ms	3.41533ms	1.74567ms	3.811068
2	15.8117ms	17.1183ms	11.8353ms	13.245ms	16.1537ms	11.40914
3	18.8693ms	20.0967ms	22.5793ms	21.6723ms	21.6017ms	17.19
4	22.843ms	19.42ms	19.4603ms	19.7547ms	18.5583ms	20.00726
5	26.502ms	21.5553ms	20.3213ms	35.7713ms	20.717ms	24.97338
6	24.2637ms	19.9823ms	21.8497ms	22.6747ms	43.472ms	26.44848
7	18.408ms	51.658ms	22.7633ms	18.3373ms	26.9213ms	27.61758
8	22.9707ms	108.738ms	20.592ms	24.5743ms	25.6233ms	40.49966
9 (Destination)	18.0997ms	21.911ms	23.14ms	19.9427ms	21.442ms	16.61868

Q: Which hop is likely to incur the maximum delay?

Given our data, hop at ttl 8 will likely incur the maximum delay. Of all hops, it has the largest average RTT, however, this result could be based on the large value found in trace 2.

If we ignore that outlier, hop at ttl 7 or 6 would be close behind, yet still have that same issue where there is a larger result than the rest.