Exercise 1: Understanding the Impact of Network Dynamics on Routing

Question 1.

Which nodes communicate with which other nodes?

- 1~5
- 2~5

Which route do the packets follow?

- 0->1->4->5
- 2->3->5

Does it change over time?

- not change

Question 2:

What happens at time 1.0 and at time 1.2?

- route between node 1 and 4 disconnected at 1.0 and reconnected at time 1.2

Does the route between the communicating nodes change as a result of that?

- not change

Question 3:

Did you observe any additional traffic as compared to Step 3 above?

- yes, it happens at the beginning and at time 1.0

How does the network react to the changes that take place at time 1.0 and time 1.2 now?

- the route between node 1 and 4 is disconnected, so it change the route to 0->1->2->3->5

Question 4: How does this change affect the routing? Explain why.

- the route change to 0->1->2->3->5 and 2->3->5
- because the cost between node 1 and 4 increased, so it is not the most opitimal route

Question 5: Describe what happens and deduce the effect of the line you just uncommented.

- traffic from 2 to 5 takes two route, which are 2->1->4->5 and 2->3-5
- the line uncommented allowed take multi-route when the cost are equal

Exercise 3: Understanding IP Fragmentation

Question 1:

Which data size has caused fragmentation and why?

- 2000 bytes and 3500 bytes
- because the MTU is 1500 bytes

Which host/router has fragmented the original datagram?

- the source host

How many fragments have been created when data size is specified as 2000?

- 2

Question 2: Did the reply from the destination 8.8.8.8. for 3500-byte data size also get fragmented? Why and why not?

- yes
- three fragments can be seen in wireshark

Question 3: Give the ID, length, flag and offset values for all the fragments of the first packet sent by 192.168.1.103 with data size of 3500 bytes?

ID	length	flag	offset
39	1480 bytes	MF=1	0
40	1480 bytes	MF=1	185
41	548 bytes	MF=1	370

Question 4: Has fragmentation of fragments occurred when data of size 3500 bytes has been used? Why and why not?

- No
- it has 3 fragments, each with less than 1480 bytes

Question 5: What will happen if for our example one fragment of the original datagram from 192.168.1.103 is lost?

- it will drop the whole package