FAQs:

1. How to solve "Cannot find required executable ovs-vsctl"?

If you have followed the instructions in "Preparing your environment" section and had not run into any issues, please follow the commands below. If not, please follow the instructions in "Preparing your environment" section before trying these.

sudo apt-get install openvswitch-switch

sudo mn -c

2. Which Java version to use?

Please use java version 1.7 (Same as used in assignment1)

3. Packets are getting dropped as all the packets received are ARP packets (getEtherType() returns 0x0806). Dropping of packets corresponds to the requirements of the assignment. Then, how should we test our code?

When you start mininet, *don't* forget to include **-a** argument. Else, static ARP Cache will not be loaded on the hosts and the host will be sending ARP packets to populate its ARP cache. So, please pass -a argument when starting mininet

sudo ./run_mininet.py topos/single_sw.topo -a

4. Not able to start POX. Error shows "Address already in use".

There should be other instances of POX already running. You will have to kill them after finding the PID of the POX process

ps aux | grep pox

kill -9 <PID>

5. What is a gateway address? How different is it from destination address?

When Router A receives a packet which is destined to a host on a different network, then you will have to forward the packet to the next router (Router B) along the way. This has to continue, until the packet reaches the router whose one of the interface is connected to the network where the destination host is present. In this case, if Router A has to use the gateway address to forward the packet to the next router.

6. In Virtual Switch, should we remove MAC entries immediately after timeout or should we remove it after the next packet arrives?

You are required to remove expired entries immediately after their respective timeouts. **DO NOT** wait for the next packet. Simple way to implement is to have a thread that is always running and scans the table with a granularity of a second and delete entries after TIMEOUT duration. However, any other approach is acceptable as long as it achieves the expected results.

7. Should we have any print statements for functionality?

You are not required to have any print statements. You can have it for debugging purposes. However, we are going to test your code by inspecting the expected packets that were actually sent.

8. How to run topologies with multiple routers/switches?

You can either use *& (ampersand)* between two java commands or open different terminals and run command independently.

eg: *java -jar VirtualNetwork.jar -v r1 -r rtable.r1 -a arp_cache &*

java -jar VirtualNetwork.jar -v r2 -r rtable.r2 -a arp_cache

9. Should we test for cases where we ping to a host which is not existing in the network?

You could assume that all the hosts in the topology are included in the arp cache. However for completeness, drop the packet if you find the host is not existing after ARP Cache lookup.

10. What should we do in a case where a switch broadcasts packet to the router interface? Should the router send the packet back again in the incoming interface (based on destination address)?

You should not forward packets if the destination (after lookups) points to the interface from which it is received. Simply drop such packets.

11. Wget command not able to fetch pages from any hosts. How to test?

You will have to run web server in one of the hosts. Follow these instructions below.

1. Open window for any host on which you are planning to run a web server

   xterm h1
2. Go to the assignment folder and check for http server implementation

   cd ~/assign2/http_server
3. Start the server

   python webserver.py

Now you should be able to use ***wget h1*** from other hosts to fetch some web pages.

12. What is the proper way to exit POX/Mininet?

It is not a good practice to use ctrl+c to exit from POX or mininet as it may make the processes running in the background leading to other unexpected issues. Use **exit()** command to exit from POX and **exit** command to exit from mininet. However, for your router and switch java processes you could use ctrl+c to stop that process.

13. Is there a limit on the MAC address table size?

There is no limit on the size of MAC address table. You can use dynamically growing data structures like ArrayList() to store the list of entries.