Assignment 1

-190010008

Q1.

(a) For www.youtube.com
4 packets were sent
the success rate was 100%
The failure rate is 0%
0 packets lost
average RTT = 68 ms

For www.codeforces.com
4 packets were sent
the success rate was 100%
The failure rate is 0%
0 packets lost
average RTT = 202ms

For www.amazon.com
4 packets were sent
the success rate was 100%
The failure rate is 0%
0 packets lost
average RTT = 137ms

(b) Factors that influence RTT are :
Number of network hops : Intermediate routers or servers take time to process a signal thus increasing the RTT. The more hops the packet has to travel through the network, the higher the RTT.

Network Traffic Levels :
RTT typically increases when a network is congested with high levels of traffic like in www.codeforces.com. Conversely, low traffic times can result in decreased RTT as in www.youtube.com.

Q2.

(a) We see that the packet takes 8 hops to redirect to www.youtube.com
Network Map : 192.168.43.1 (source) → 117.96.120.1 → 125.22.219.118 → 182.79.224.124 → 72.14.212.48 → 209.85.246.51 → 142.250.235.11 → 142.250.67.206 (destination)
We also see that the packet takes 8 hops to redirect to www.google.com
Network Map : 192.168.43.1 (source) → 117.96.120.1 → 125.22.219.118 → 182.79.142.119 → 72.14.212.48 → 209.85.246.11 → 142.250.214.113 → 142.250.183.132 (destination)

(b) We can change the maximum hop number using **tracert -h max_hops ipaddress** command in windows and **traceroute -m max_hops ipaddress** command in linux. This specifies the maximum number of hops (max time-to-live value) traceroute will probe. The default is 30 for windows and 64 for linux.

(c) The three timestamps in the result of Traceroute signify three round trip times(RTT) in milliseconds.

(d) The time between sending the packet and receiving back the ICMP message that it was discarded is used to calculate each successive hop travel time. In IP multicast, the TTL controls the scope or range in which a packet may be forwarded. The TTL is defined to be a timer limiting the lifetime of a datagram or packet.The purpose of the TTL field is to avoid a situation in which an undeliverable packet keeps circulating on an Internet system indefinitely. Also when a router forwards a packet then the TTL must be reduced by 1. But if the router holds a packet for more than 1 second then it may decrement the TTL by 1 for each second.

Q3.

(a) Machine Hostname : **ATHARVA**
Machine IP Address : **192.168.43.73**
Command used : **ipconfig /all** (windows)
hostname and **hostname -i** (linux)

(b) Next Hop Router :

For Windows:
IP Address : **117.96.120.1**
Mac-Address : **d8-1e-dd-fa-70-2f**
Commands used : **tracert** and **arp -a**

For Linux:
IP Address : **10.0.2.2**
Mac-Address : **52:54:00:12:35:02**
Commands used : **arp -a**

We can't get this information from any of the network configuration files.

(c) The local DNS server's IP address : **192.168.43.1**
We can get this information from the **/etc/resolv.conf** file (linux) or use the command **ipconfig /all** (windows)

(d) The numbers in the file **/etc/protocols** represent the **port numbers** of different protocols. A port number is a way to identify a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. It is the official number for this protocol as it will appear within the IP header.

(e) SSH : **22**
FTP : **20 , 21**
NFS : **2049**
SMTP : **25**
We can get this information from the **/etc/services** file.