Experiments

(If you want to hide your IP, MAC, etc. please mask the last portion)

1. Find the IP address of your computer (ipconfig, ifconfig). You may need your root password.
2. Find the IP address of your favorite domain using (ping, traceroute) or other tools.

   Some sites block ping for security reasons. Some sites like cnn.com (2a04:4e42:200::323) or bbc.com (2a04:4e42::81) use IP.v6. Other sites like wasp.cs.kent.edu (131.123.35.17) use IP.v4. IP.v4 address field is 4 bytes and IP.v6 is 16 bytes.
   If you can't find any open IP address, you can ping saturn.cs.kent.edu
3. Find the GPS of the IP addresses found
   You can use https://www.iplocation.net/ or other similar sites
4. Measure the delay (RTT) from your computer to the IP address you found (ping, traceroute). This would be a round trip time (access delay + propagation delay + transmission delay + queuing delay).

5. Collect 100 samples of round-trip times by ping -c 100 saturn.cs.kent.edu (or IP address of your choice)

You can see the RTT's are not identical. This means that Internet distance (in time) between two computers/routers is not fixed.
Plot a histogram (distribution) of RTT's. You can use online tools such as http://www.shodor.org/interactivate/activities/Histogram/, a spread sheet, or write your own code in Python, MATLAB, R, C++. Most software tools come with statistical packages.

Questions to answer:

- ❖ What do you observe? Normal distribution (Bell shape) or something else?
- ❖ Calculate the mean and variance of RTTs
- ❖ Suggest an appropriate time-out (waiting time) based on the mean and variance you have collected This is called Time-out (TO). Greenly twice of the average

Optional

I. Now measure the delay from your computer to your computer and ping your own computer. The above RTTs are end-to-end delays including L3 (UDP/IP) delays. By pinging your own computer, you are mitigating the impact of L3 delays.

II. Do Steps 4-5 for this set of data and report the results for this scenario.

What to submit

For each case make a snapshot showing the command used and the output. Make one pdf file of all and upload it to Canvas.