Mahimahi for Project 2

General Usage:

Mahi-mahi is basically a network emulator which is used to emulate different link conditions, by replaying the traffic.

It is a suite of user-space tools for network emulation and analysis

Download link: http://mahimahi.mit.edu/

Command Usage General:
https://manpages.ubuntu.com/manpages/xenial/man1/mahimahi.1.html

Delay:
With Mahi Mahi, you can emulate fixed propagation delay using the command mm-delay
mm-delay delay value [for-example mm-delay 5]

- This will add 5 milliseconds delay to every packet that is being sent or received.

Loss:

- You can add stochastic packet loss (which is basically a percentage of the overall loss over the links)
- mm-loss downlink rate or mm-loss uplink rate
- [The rate is basically the percentage value between 0-1][0.2 means 20%]
- Example command: mm-loss downlink 0.2 or mm-loss uplink 0.1

Combination:
You can combine all these commands (loss|delay) in to a single command for example:

mm-delay 10 mm-loss uplink 0.5 mm-loss downlink 0.2
This will emulate a network with a delay of 10 millisecond for each packet, and loss rates of 50 percent for uplink and 20 percent for downlink.

For project 2, you need to go beyond these commands.
For testing of your code, I will use conditions like these (examples):

- Delay: 5, uplink 0.2, downlink 0.4
- Delay: 1, uplink 0.4, downlink 0.6
- Delay: 0, uplink 0.8, downlink 0.8
- Delay: 50, uplink 0.5, downlink 0.5

Setup for emulating the network using mahimahi, running the starter code with sender/receiver.

Step 1:

Open two terminals. 1 for running sender and one for the receiver.

Step 2:

Run the Receiver:

Command: . /rdt_receiver 5454 new_sample.txt
5454 is the port number
New_sample.txt is the filename, which we will write upon receiving from the sender.

Step 3:

Before running the Sender code. Run the following command for mahi-mahi:

mm-delay 5 mm-loss uplink 0.2 mm-loss downlink 0.5

The above command will add a 5ms delay to each packet, a 20 % loss to the uplink capacity and 50 percent loss for the downlink.
Currently, you will see that the file will not be received correctly because there is no handling of loss packets. To correctly receive file in the starter code of rdt_sender/rdt_receiver, just use delay without loss: mm-delay 5)

Step 4:

Run your Sender:

Command: . /rdt_sender $MAHIMAHI_BASE 5454 sample.txt
MAHIMAHI_BASE is the proxy between sender and receiver, you just need to specify the string ‘ $MAHIMAHI_BASE’, mahimahi will fill in the address.
5454 is the port no of the receiver.
Sample.txt is the file that we will send.