Assignment 2

Guidelines:

Please remember that the assignment must be solved individually. A pdf file with your solutions to the different exercises needs to be uploaded in the "Assignment 2" folder. This .pdf must be named A2_IDi.pdf, where IDi is your McGill id number. Inside the pdf file indicate your name and student id also in the header. **Due date: March 20, 11:59 PM**.

Exercise 1: Network layer

This hands-on exercise aims at further investigating the IP datagram using the wireshark tool. You will need to do the following:
1. Install the wireshark tool on your machine and explore it. For that, you can rely on the following guide, uploaded to myCourses: Wireshark_Intro_v6.0.pdf
2. You need to cover the wireshark IP lab uploaded to myCourses and provide answers to the questions indicated in the document: Wireshark_IP_v6.0.pdf
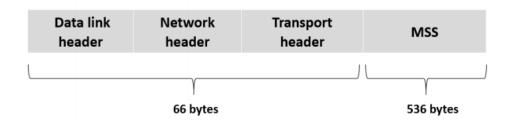
Exercise 2 – UDP and TCP

1. Which service offered by UDP justifies the need for this protocol in addition to the IP protocol?

2. Why would an application want to use UDP rather than TCP?

3. Explain the difference between congestion control and flow control and describe briefly how the TCP protocol offers these services.

4. TCP acknowledgments arrive after 20, 30 and 25 ms. What is the new estimated RTT value after each of these acknowledgments arrived, taking an initial estimated RTT of 30ms and $\alpha = 0.125$?

Exercise 3: TCP sequence numbers
Consider transferring an enormous file of L bytes from Host A to Host B. Assume an MSS of 536 bytes.

a. What is the maximum value of L such that TCP sequence numbers are not exhausted? Recall that the TCP sequence number field has 4 bytes.

b. For the L you obtain in (a), find how long it takes to transmit the file. Assume that a total of 66 bytes of transport, network, and data-link header are added to each segment before the resulting packet is sent out over a 155 Mbps link. Ignore flow control and congestion control so A can pump out the segments back to back and continuously.

Data link header	Network header	Transport header	MSS

66 bytes   536 bytes