CARLETON UNIVERSITY
School of Computer Science

COMP3203– Principles of Computer Networks
Assignment 1

Instructor: Prof. AbdelRahman Abdou

Winter 2022

The assignment is **worth 3.64%** of the total course grade. It is graded out of 25, so your mark will be scaled accordingly.

You should submit a PDF document with your solutions in the respective assignment dropbox on Brightspace. For example, if you use MS Word, save it as PDF and upload. Name the PDF file as:

"A#_FirstName_LastName_StudentNumber.pdf"

So if John Smith, whose number is 123456789, is uploading the solution for Assignment 3, John should name the file "A3_John_Smith_123456789.pdf".

Make sure you upload your solution before the deadline, which is at **11:59pm EST on Feb 1st**. As usual, feel free to ask questions on our Brightspace forum.

Distribution of Marks

Question	Points	Score
1	15	
2	10	
Total:	25	

1. Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates $R_1 = 400Kbps$, $R_2 = 1.6Mbps$, and $R_3 = 800Kbps$.
   (a) (5 points) Assuming no other traffic in the network, what is the throughput for the file transfer?
   (b) (5 points) Suppose the file is 5 million bytes. Diving the file size by the throughput, roughly how long will it take to transfer the file to Host B?
   (c) (5 points) Repeat (a) and (b), but now with R_2 reduced to $100kbps$.
2. Review the car-caravan analogy in Section 1.4 of the textbook (Fig.1.17). Assume a propagation speed of $130km/hour$.
   (a) (5 points) Suppose the caravan travels $120km$, beginning in front of one tollbooth, passing through a second tollbooth, and finishing just after a third tollbooth. What is the end-to-end delay?
   (b) (5 points) Repeat (a), now assuming that there are seven cars in the caravan instead of ten.