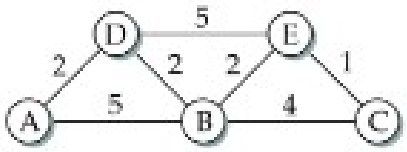
CMP-4005 -- Homework 3

Answer the following questions.

1) Read the following Wireshark tutorial, and use it to capture traffic from the following scenarios. Use screenshots to show your results.

   a) Run 10 traceroute commands against google.com
   b) Watch a video from youtube.com. Capture the TCP handshake, and the congestion window.

2) Use Dijkstra's to get the routing tables for nodes A, B and E.



3) Suppose a host wants to establish the reliability of a link by sending packets and measuring the percentage that are received; routers, for example, do this. Explain the difficulty of doing this over a TCP connection.

4) Consider a simple congestion control algorithm that uses linear increase and multiplicative decrease (no slow start). Assume the congestion window size is in units of packets rather than bytes, and it is one packet initially.

   a) Give a detailed sketch of this algorithm.
   b) Assume the delay is latency only, and that when a group of packets is sent, only a single ACK is returned.
   c) Plot the congestion window as a function of RTT for the situation in which the following packets are lost: 9, 25, 30, 38 and 50. For simplicity, assume a perfect timeout mechanism that detects a lost packet exactly 1 RTT after it is transmitted.