CME 451 – Transport Networks – Winter 2017
Assignment 3
Due Date: February 15, 2017

This assignment contains 11 problems. Completed assignments must be submitted on the specified due date by 4:30pm in the CME451 assignment box (second floor, across Room 2C94E). Late assignments will not be marked, and will be given a mark of zero.

Marking scheme:

- 30% completion mark
- 70% based on a selected set of problems (to be determined by the marker)

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1. Read chapters 5 (Iniewski textbook); 2, 20, 23 (Forouzan textbook)..
2. Explain the connections between the layers in the OSI model and those in the TCP/IP protocol suite. [Hint: you may wish to draw a block diagram].
3. Describe the following types of address: (a) physical address; (b) logical address; (c) port address. [Hint: you should describe at least the relevant layer, the number of bits used]. Give an example for each type.
4. Describe the following types of delivery, and identify the associated layer in each case: (a) node-to-node delivery; (b) host-to-host delivery; (c) process-to-process delivery.
5. What are the min & max values of the HLEN field (in IPv4)? When are these values encountered?
6. Explain the following concepts (related to IPv4): (a) best effort; (b) connectionless.
7. In IPv4, what is fragmentation, and when is it needed?
8. An IPv4 fragment arrives with an offset of 50. How many bytes were originally sent before the data in this fragment?
9. Find the HLEN field (in binary format for IPv4), if the total length is 1228 bytes, 1168 of which is data from the upper layer.
10. An IPv4 datagram arrives with the following information in the header:
    0x45 00 0C 75 00 03 58 45 10 06 00 00 6C 1A 5C 11 5D F2 2C D5
    Show your calculations in answering the following questions.
    (a) What is the size of the data?
    (b) How many more routers can the packet travel to?
    (c) What are the source and destination addresses? [Hint: use IP address format]
11. List the transition strategies to move from IPv4 to IPv6. Explain their application scenarios.