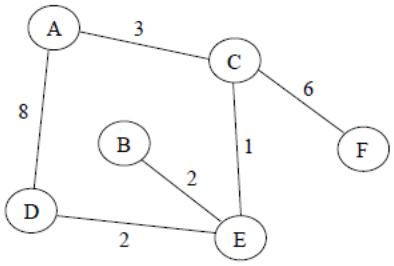
CMPE 570/670

HW#2

Due: Thursday 11/04/2021

1. (15 pts) Consider Cyclic Redundancy Check (CRC) and a data sequence: 101101100101. Use the divisor 1101 to determine the actual transmitted bit sequence. Show your work clearly.

2. Consider the following network and find the routing tables using the Bellman-Ford and Dijkstra algorithms.
    a. (15 pts) Use the distance-vector (Bellman-Ford) algorithm and show how the distance tables for the nodes evolve and come to the final routing tables for all the nodes. (How many iterations do you go through? Do you need to follow a particular order for the exchange of message between nodes?)
    b. (15 pts) Use the link-state (Dijkstra) algorithm to determine the routing tables for all the nodes in the figure below. You may follow the same format as discussed in the class. You do not need to worry about the Phase 1: flooding of link-states.
    c. (10 pts) Check on the consistency between what you found using the two different methods. Based on your experience with these exercises, compare and comment on the two algorithms in terms of their complexity (note that this exercise does not require to do the flooding phase for the link state algorithm). Does your conclusion match with what you learn?



3. (15 pts) In the case of doing collision resolution with exponential back-off with 10BaseT Ethernet (slot time is 51.2 μs), what would be the probability of waiting for 153.6 μs after 3 successive collisions?

4. (15 pts) Explain why would one need a minimum frame size for CSMA/CD protocol? You should explain how this relates to the fact that CSMA/CD does not need acknowledgement.

5. (15 pts) Find a scenario for which you will make the following choice and explain why.
    a. Choose ALOHA over CSMA/CD?
    b. Choose CSMA/CD over ALOHA?