CSE/EE 461
Assignment 7
Due Wednesday, November 26, 1997

Your solutions must contain the derivation of your answers.

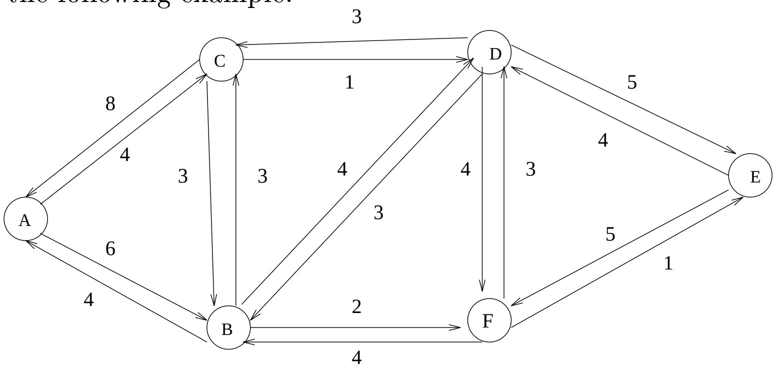
1. In this problem we will compare the cost of a virtual circuit network and a datagram network.

   For simplicity we will assume that all packets hold the same amount of data, virtual circuit packets have a 5 byte header and datagram packets have a 20 byte header. A switch in the virtual circuit network requires 8 bytes of storage for each circuit established. Transmission costs 1 cent per 10^6 bytes, per hop. Switch memory costs about .5 cents per byte and is depreciated over 2 years. Statistically the average session runs for 2000 seconds, in which time 400 packets are transmitted. The mean packet requires 5 hops.

   (a) Which implementation is cheaper and by how much?

   (b) What costs are not included in the explanation above and why are they not needed in the analysis of which kind of network is cheaper?

2. This problem provides practice in understanding Dijkstra's shortest path algorithm. Consider the following example.



   (a) Find the shortest past from A to every other node. Demonstrate the steps in Dijkstra's algorithm. In this example the cost of going from a node X to a node Y is not necessarily the same as that of going from a node Y to X. This does not really change the algorithm.

   (b) Construct A's routing table.