CS A342
HW #4, 39 points total
Due Thursday, Nov. 8, by 10 AM before class (will go over solutions)

1. (3 pts) Use a laptop or other device on UAA's wireless network. UAA uses DHCP; list your IP address, network mask, default router, and IP address of the local DNS server. (Use ipconfig or ifconfig).

2. (3 pts) In the IP datagram header, what value is stored in the "Upper Layer" field for an ICMP ping? What is the value stored in this field for a TCP datagram?

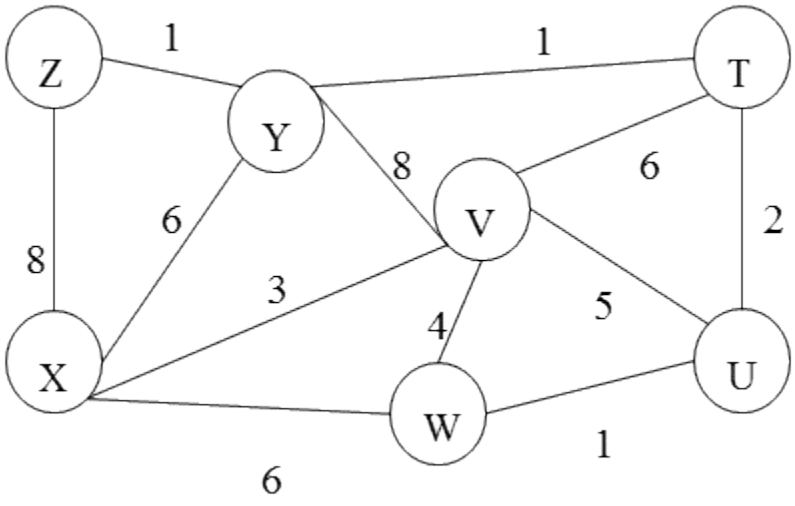
3. (8 pts) Consider sending a 2400 byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? What are the values in the offset and fragmentation bit fields in the IP datagrams generated?

4. (4 pts) You have 3 computers on the private home network of 192.168.0.0/16 and your ISP assigned your router the address of 24.34.112.235. Your router uses NAT.

   a. Assign valued IP addresses to the 3 computers on your private home network.

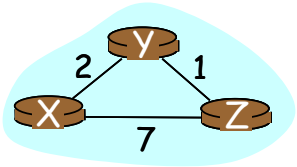
   b. Suppose each computer has two outgoing TCP connections, all to port 80 at host 137.229.156.12. Provide six valid entries in the NAT translation table.

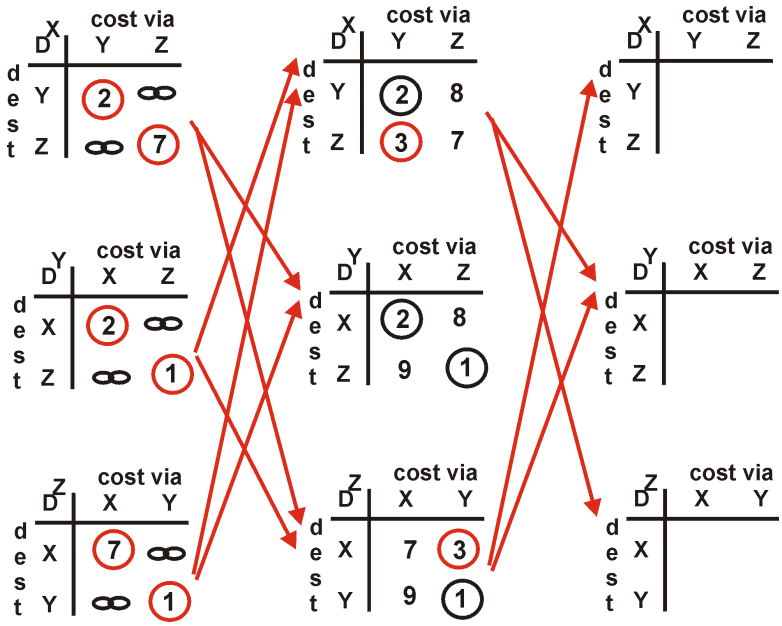
5. (8 pts) Consider the network below. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from xo to all network nodes. Show how the algorithm works by completing the table. Entries for step 0 and 1 have been filled in for you.



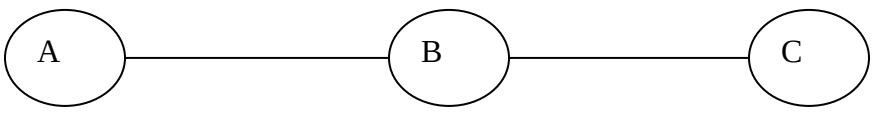
Step	N'	D(t),p(t)	D(u),p(u)	D(v),p(v)	D(w),p(w)	D(y),p(y)	D(z),p(z)
0	x	∞	∞	3,x	6,x	6,x	8,x
1	xv	9,v	8,v	3,x	6,x	6,x	8,x
2							
3							
4							
5							
6							

5. (6 pts) In class we described the distance-vector algorithm used to compute shortest paths among routers (e.g. in RIP). Complete the values for the distance tables in the last column for the example below:





6. (4 pts) Given the following network using RIP, describe what happens in the "Count to Infinity" problem when node C crashes? Assume the edge costs are the hop count (i.e. 1). Do we really end up counting to infinity or stop before that?



7. (3 pts) Why might the Reverse Path Forwarding technique for multicast be bad for asymmetric links?