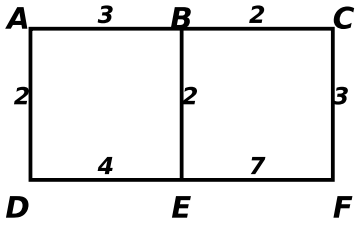
Homework 1

Due: 5 October 2021

v20211001-0545

Problem 1.1

A small network is configured as shown in the following diagram:



Assume that the link delay time is as marked, and stable; and that each node has an accurate estimate of the delay on the links directly connected to it. The system has converged on the following routing tables using distance vector routing.

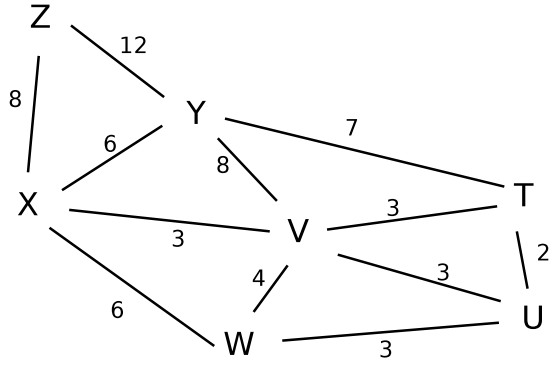
	A		B		C		D		E		F	
A	—		3	A	5	B	2	A	5	B	8	C
B	3	B	—		2	B	5	A	2	B	5	C
C	5	B	2	C	—		7	A	4	C	3	C
D	2	D	5	A	7	B	—		4	D	10	C
E	5	B	2	E	4	B	4	E	—		7	E
F	8	B	5	C	3	F	10	F	7	F	—	

a. What happens when router B goes down? Do the tables converge on a new stable routing? If so, say how many steps that will take (i.e. which "pushes" need to occur; assume that a full round of pushes happens before anyone pushes a second time), and what the converged-upon routing is. If not, explain why not.

b. Two hours after B goes down, E also goes down. What happens then? Do the tables converge on a new stable routing? If so, say how many steps that will take, and what the converged-upon routing is. If not, explain why not.

Problem 1.2

Referring to the following network graph, answer the following questions:



a. Not counting the pings used to compute RTT and thus link weights, how many messages are sent through the network in the course of running the link-state routing table algorithm? What are the sizes of those messages?

b. How many messages are sent to bring the distance-vector algorithm to convergence? How big are those messages?

c. Are the numbers from parts a and b directly comparable? Why or why not?