

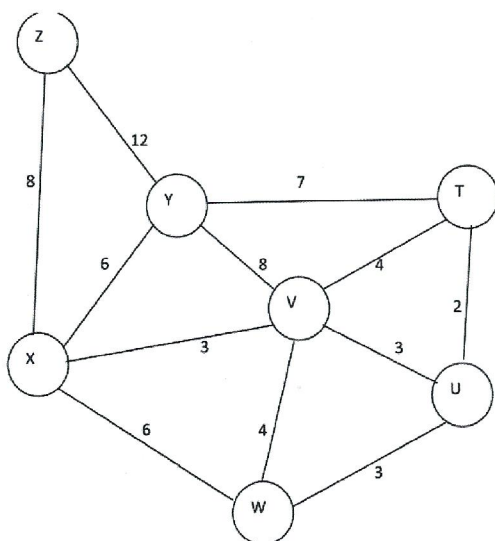
CS4470 – Fall 2017

Homework 3

Due Date: November 7, 2017

Time: beginning of the class for hard copy; midnight for CSNS uploading

1. (50 points) Consider the network shown below, with the indicated link costs:



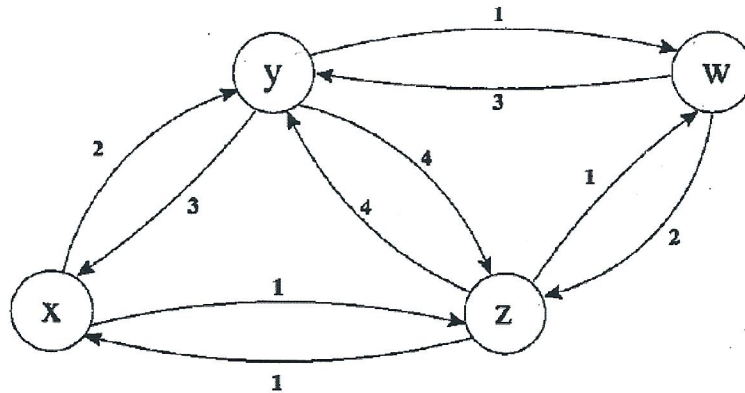
Use Dijkstra's algorithm to compute the shortest path from x to all network nodes, and fill the table:

Step	N'	T D(t), p(t)	U D(u), p(u)	V D(v), p(v)	W D(w), p(w)	Y D(y), p(y)	Z D(z), p(z)
0	x	∞	∞	3,X	6,X	6,X	8,X
1	xv	7,V	6,V	3,X	6,X	6,X	8,X
2	xvu	7,V	6,V	3,X	6,X	6,X	8,X
3	xvuw	7,V	6,V	3,X	6,X	6,X	8,X
4	xvuwY	7,V	6,V	3,X	6,X	6,X	8,X
5	xvuwYT	7,v	6,V	3,X	6,X	6,X	8,X
6	xvuwYTz	7,v	6,V	3,X	6,X	6,X	8,X

Note: if the tie occurs (that is, two or more nodes are found to have the same least cost), add the node to the set N' in order of t, u, v, w, y, z. For example, if u, w, y has the same least cost, then first add u to the set N' because u is before w or y in the table.

$dx(y) = \min \{c\{x,v\} + dv(y)\}$
 $dx(y)$ - least cost path from node x to y

2. (50 points) Consider the graph in the following figure:



Use distance vector algorithm to calculate and fill in the distance-vector table for node x.

x node initial

	x	y	z	w
x	0	2	1	∞
y	∞	∞	∞	∞
z	∞	∞	∞	∞
w	∞	∞	∞	∞

x node

	x	y	z	w
x	0	2	1	∞
y	3	0	4	1
z	1	4	0	1
w	∞	3	2	0

x node

	x	y	z	w
x	0	2	1	3
y	3	0	3	1
z	1	3	0	1
w	3	3	2	0