California State University, Monterey Bay

Week 7 - Homework 9

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*CST311*

Introduction to Computer Networks

SUMMER 2015

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Problem

This problem is taken from 'Computer Networking: A Top-Down Approach', 6/E by Kurose and Ross.

Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from x to all network nodes. Show how the algorithm works by computing a table similar to the one shown in the video.
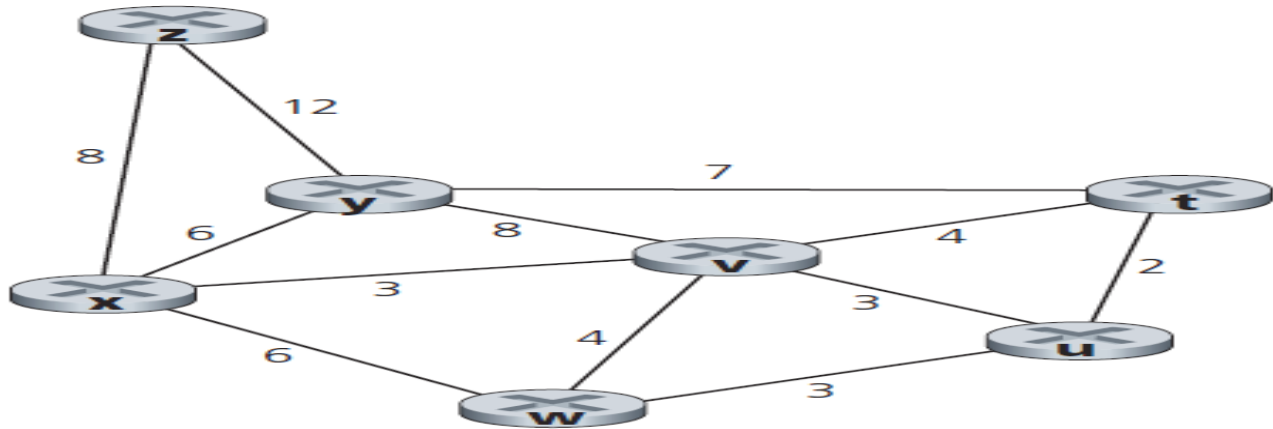
Notes:
- In the table below, the value for the next chosen node is not repeated (shown) until the final step to allow focusing on the node selection.
- In the video he used tennis balls for nodes and string for links. He began picking up the balls (nodes) and processing the balls (nodes) as he reached them. That would mean that in step 2 there is a choice of either u, w, or y (as they are all 6 from x). Since U is 3 from v, it was chosen next.

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	x,v	7,v	6,v		6,x	6,x	8,x
2	x,v,u	7,v			6,x	6,x	8,x
3	x,v,u,w	7,v				6,x	8,x
4	x,v,u,w,y	7,v					8,x
5	x,v,u,w,y,t						8,x
6	x,v,u,w,y,t,z	7,v	6,v	3,x	6,x	6,x	8,x