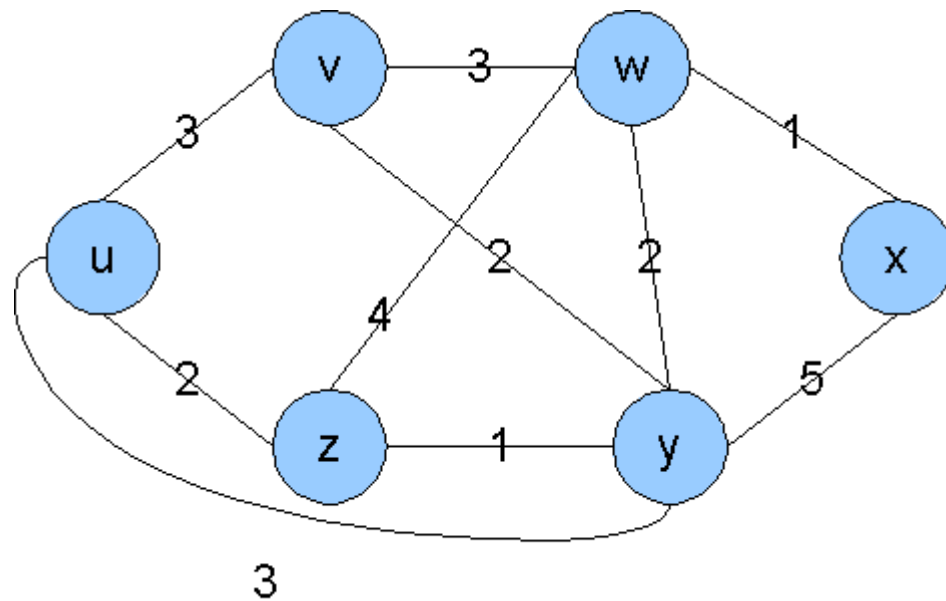


## Homework #5

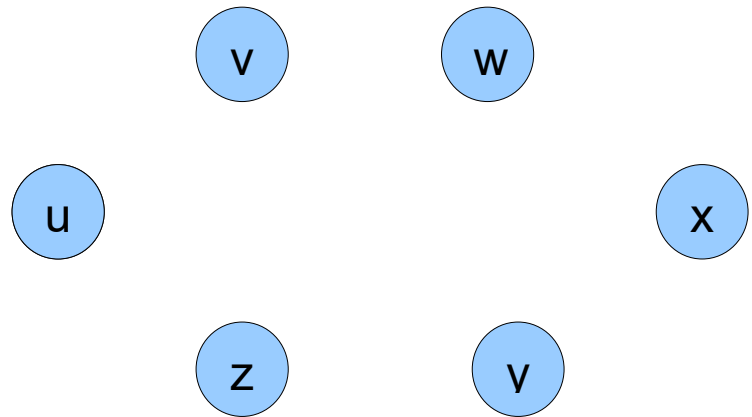
(Due on December 5<sup>th</sup> 2019)

**Q1.** Given the following network, use Dijkstra's algorithm to find the least cost paths from node u. Please provide a table showing the steps of the algorithm, a graph showing the resulting shortest-path tree from u and the final forwarding table of u.

Step	N'	D(v), p(v)	D(w), p(w)	D(x), p(x)	D(y), p(y)	D(z), p(z)



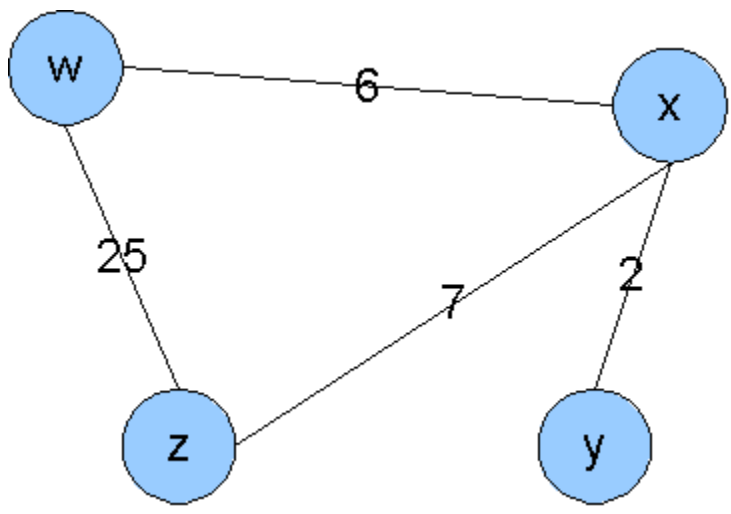
**Resulting shortest-path tree**



**Resulting forwarding table in u**

Destination	Link

**Q2. Given the following network, use the Distance Vector algorithm to find the least cost paths for all nodes. Fill the provided tables and indicate with arrows between the tables when a node sends a distance vector to another node.**



Node w		cost to				Node w		cost to				Node w		cost to									
		w	x	y	z			w	x	y	z			w	x	y	z						
from	w					from	w					from	w					from	w				
	x						x						x						x				
	y						y						y						y				
	z						z						z						z				

Node x		cost to				Node x		cost to				Node x		cost to									
		w	x	y	z			w	x	y	z			w	x	y	z						
from	w					from	w					from	w					from	w				
	x						x						x						x				
	y						y						y						y				
	z						z						z						z				

Node y		cost to				Node y		cost to				Node y		cost to									
		w	x	y	z			w	x	y	z			w	x	y	z						
from	w					from	w					from	w					from	w				
	x						x						x						x				
	y						y						y						y				
	z						z						z						z				

Node z		cost to				Node z		cost to				Node z		cost to									
		w	x	y	z			w	x	y	z			w	x	y	z						
from	w					from	w					from	w					from	w				
	x						x						x						x				
	y						y						y						y				
	z						z						z						z				

**Q3. Compare Link State routing algorithms to Distance Vector algorithms in terms of scalability and robustness.**

**Q4. Explain the count-to-infinity problem using a simple example. How can this problem be avoided?**

**Q5. How are routing policies used in BGP. Give one example.**

**Q6. What is the difference between Intra-AS and Inter-AS routing? Why are different routing protocols needed for each? Name one example for each category.**