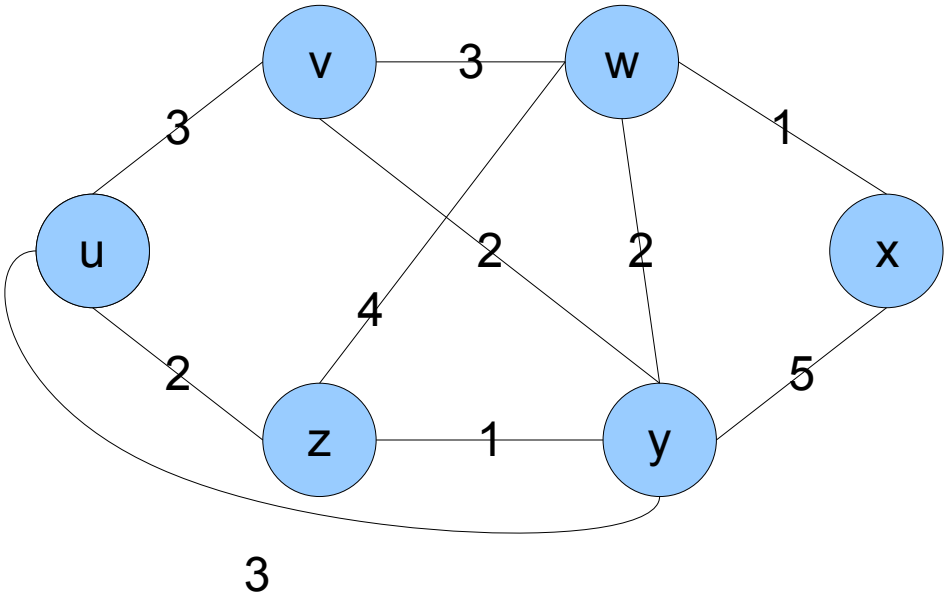
Computer Networks Group
University of Göttingen, Germany

Homework #5

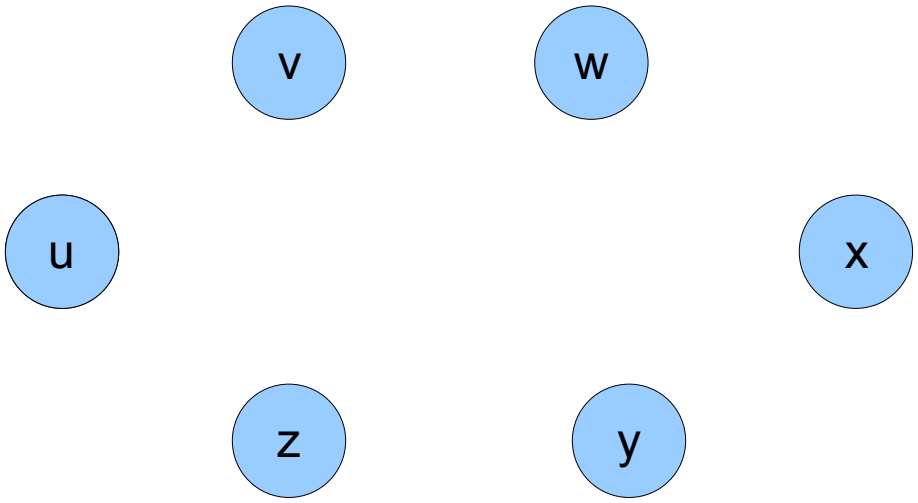
(Due on 12:00am, Thursday, Nov. 26, 2009)

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)

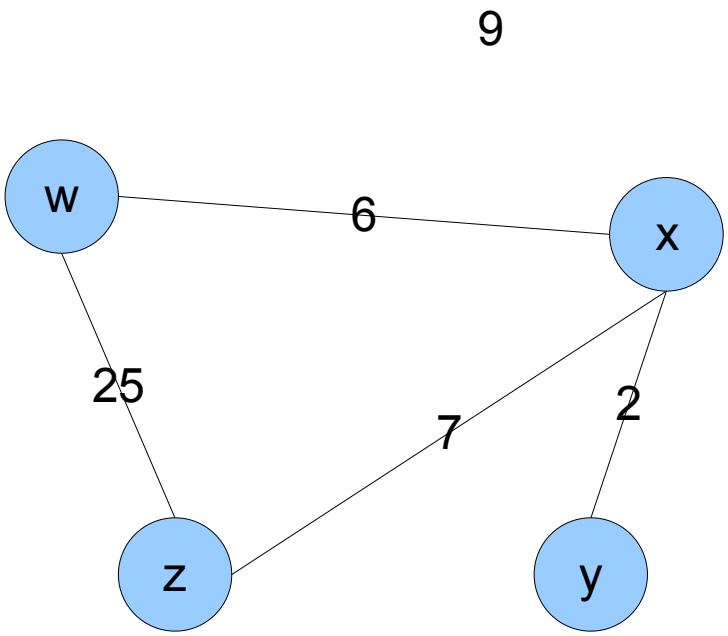
Resulting shortest-path tree



Resulting forwarding table in u

Destination	Link

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			
		w	x	y	z
from	w				
	x				
	y				
	z				

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain the concept of hierarchical routing. Why is it needed?

What is RIP and what metric does it use?

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

Why are different inter-AS and intra-AS protocols used in the Internet?