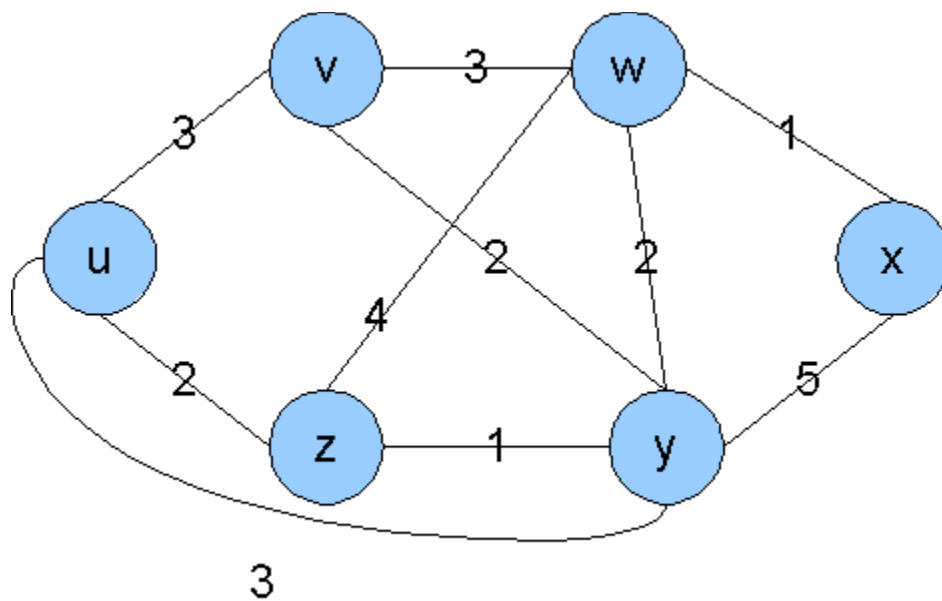


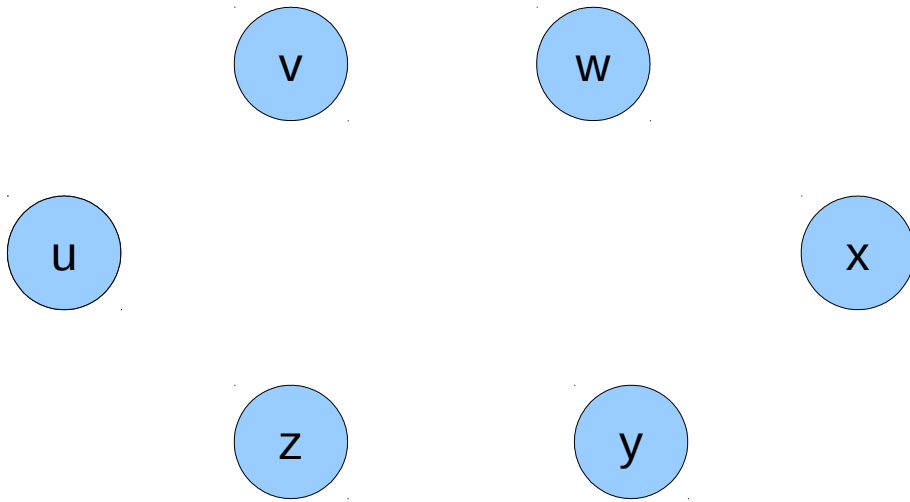
Homework #5 (Due on 12:00am, Thursday, Nov. 28th, 2013)

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) |
|------|----|------------|------------|------------|------------|------------|
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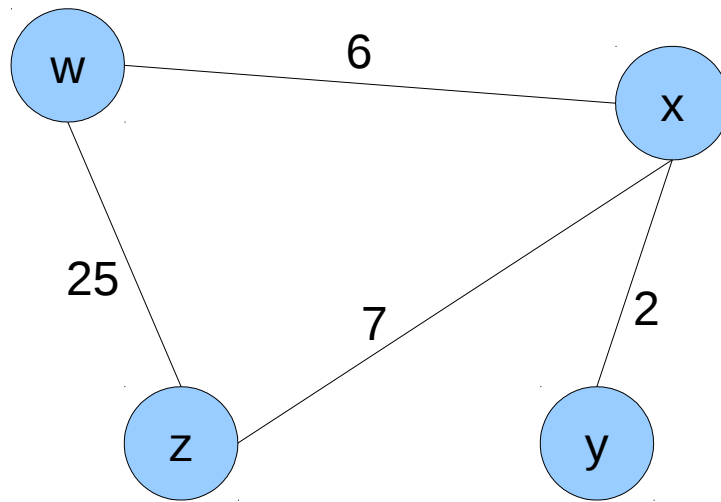
Resulting shortest-path tree



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 | | | | 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 | | | | |

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

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

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

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.