ITEC 350
Homework #2

Problem 7.32 and Problem 7.33 of the textbook (page 567).

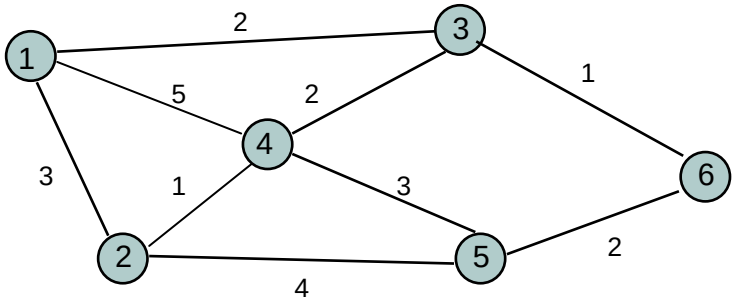


Figure 7.30

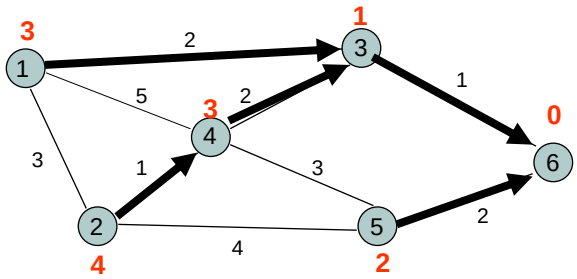
7.32 Consider the network in Figure 7.30

a) Use the Bellman-Ford algorithm to find the set of shortest paths from all nodes to destination node 2.

b) Now continue the algorithm after the link between node 2 and 4 goes down. (Note: Assume that we do not use Split Horizon or Poisoned Reverse)

Hint: The answers for problem (a) and (b) should be in the following format respectively. The following shows the set of shortest paths from all nodes to destination node 6.

Iteration	Node 1	Node 2	Node 3	Node 4	Node 5
Initial	(-1, ∞)	(-1, ∞)	(-1, ∞)	(-1, ∞)	(-1, ∞)
1	(-1, ∞)	(-1, ∞)	(6, 1)	(-1, ∞)	(6,2)
2	(3,3)	(5,6)	(6, 1)	(3,3)	(6,2)
3	(3,3)	(4,4)	(6, 1)	(3,3)	(6,2)



7.33 Consider the network in Figure 7.30

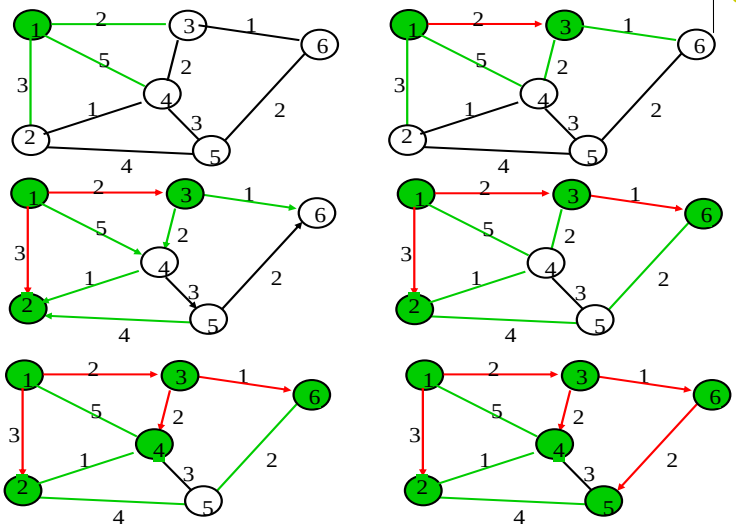
a) Use the Dijkstra algorithm to find the set of shortest paths from node 4 to other nodes.

Hint: The answer should be in the following format. You should include both a table and network topologies. The following shows the set of shortest paths from node 1 to other nodes.

Execution of Dijkstra's algorithm

Iteration	N	D_2	D_3	D_4	D_5	D_6
Initial	{1}	3	2 ✓	5	∝	∝
1	{1,3}	3 ✓	2	4	∝	3
2	{1,2,3}	3	2	4	7	3 ✓
3	{1,2,3,6}	3	2	4 ✓	5	3
4	{1,2,3,4,6}	3	2	4	5 ✓	3
5	{1,2,3,4,5,6}	3	2	4	5	3

Shortest Paths in Dijkstra's Algorithm



b) Find the set of associated routing table entries.

Hint: The answer should be in the following format.

Routing table at node 1

Destination	Next node	Cost
2	2	3
3	3	2
4	3	4
5	3	5
6	3	3