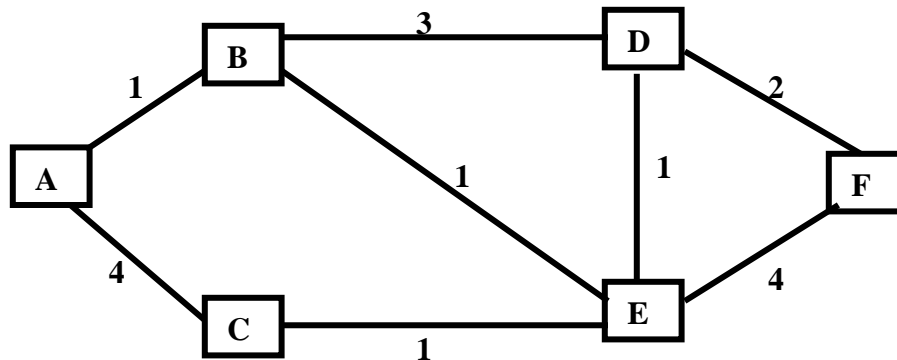


Sample Problems on Routing Algorithms
(No Solutions will be posted)

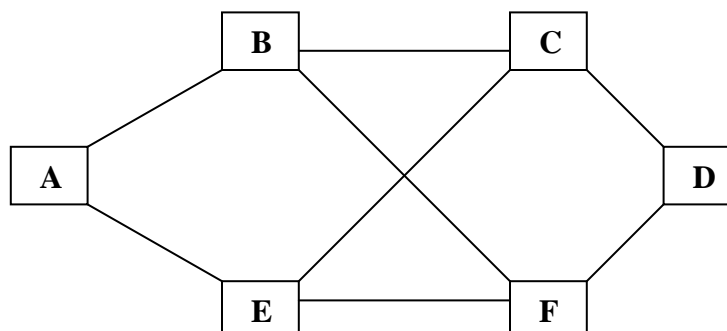
1. Consider the following computer network where each node represents a router and the edge label is the corresponding link cost. All links are bi-directional. Use Dijkstra algorithm to find the shortest path from router "A" to every other router in the network.



2. Consider the following network. Distance vector routing is used with the "minimum delay criteria" used. The following vectors have just come in to router C

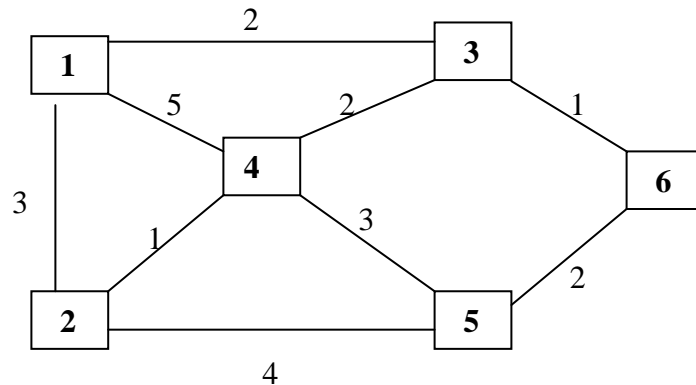
- From B: (5, 0, 8, 12, 6, 2)
- From D: (16, 12, 6, 0, 9, 10)
- From E: (7, 6, 3, 9, 0, 4)

The initial measured delays to routers B, D and E are 6, 3 and 5 respectively. What is C's new routing table? The routing Table should have 3 columns, namely: Destination Router, Delay, and Next Hop Router. Show the details of your work. I am not interested in answers only.



3. For the network shown below, assume that the Bellman-Ford routing algorithm is used. Assume that initially each router knows the distance to its neighbors. Illustrate the following:
- Initial routing table at node "1"
 - Final routing table at node "1"
 - Show clearly, how the algorithm would react if there is a failure in the link connecting nodes "3" and node "6"

Note: the routing table at R_1 should have three columns, namely: Destination, Cost and Next Hop.



4. Consider the following computer network where each node represents a router and the edge label is the corresponding link cost. Use Dijkstra algorithm to find the shortest path from router B to every other router in the network. Show your work step-by-step. Now suppose the link between router D and router F is down. Describe how the link-state protocol handles it. What would be the shortest path between router B and router G?

