**University of BADJI MOKHTAR - Annaba**
**Faculty of technology**
**Computer Science Departement**

**Class : RSA 01**

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Tutorial n: 01 "Shortest path problem in RIP & OSPF protocols"

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## Exercice 01

1. In RIP and OSPF protocols, what are the elements corresponding to the following graph theory concepts : graph, node, edge, edge weight, and shortest path tree ?
2. Are Dijkstra's and Bellman-Ford's algorithms applicable to undirected graphs (networks) ? If yes, explain how.

## Exercice 02

Given the following network of routers (Figure 1) :

1. Construct the shortest path tree from A and C using the Bellman-Ford algorithm.
2. Build the RIP routing tables for A and C.
3. Compare the execution steps (time/space complexity) in the two previous cases (1 and 2). Do they yield the same results ?
4. Construct the Link-State Database (LSDB) of the network.
5. How does the LSDB change after the failure of link BD ?
6. Construct the shortest path tree from D and B using Dijkstra's algorithm.
7. Build the OSPF routing tables for D and B, and compare them with the results of (6).

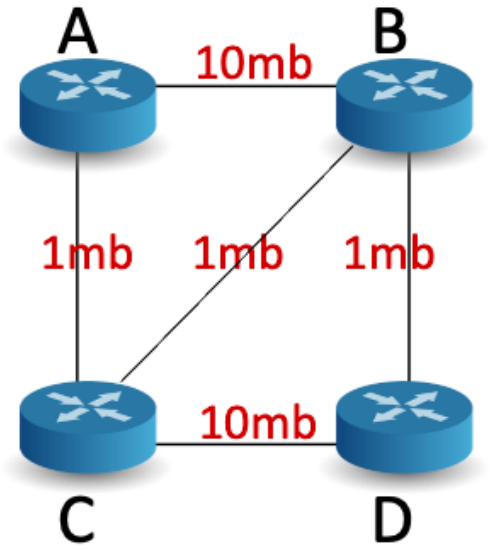


FIGURE 1 – Router network