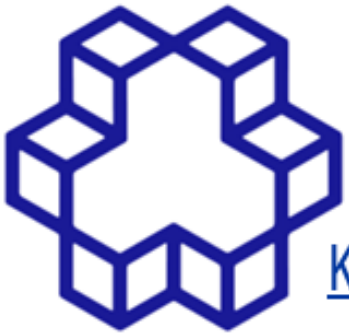


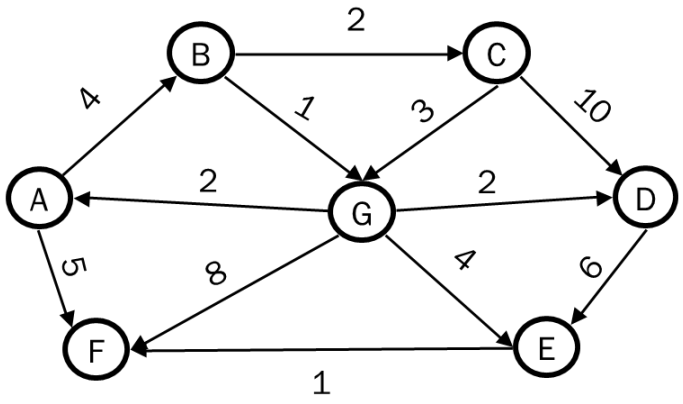
K. N. Toosi University of Technology

Assignment 3

Optical Networks

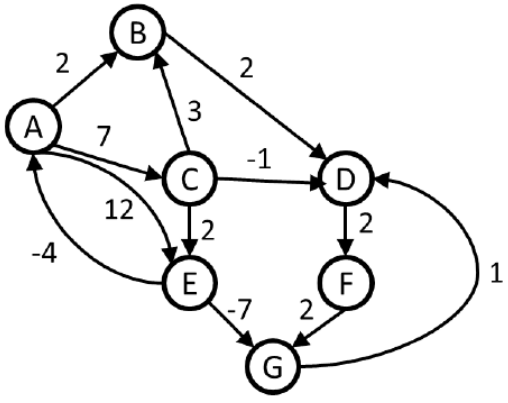
1) a- Which one of multistep RWA and one-step RWA imposes more practical complexity?
   Which one of those algorithms yields better results usually? Suppose that a network is not heavily loaded. Which algorithm is better to be deployed and why?
   b- What is the motivation of using Most-Used algorithm in wavelength assignment?

2) Determine the following statements as true or false with enough reasons:
   A. Dijkstra's Algorithm is used to solve all pair shortest path problems.
   B. If B is the source vertex, the minimum cost to reach F vertex is 15.



3) Consider the following directed, weighted graph, complete the following chart.

Source node	destination	Shortest path
A	G	

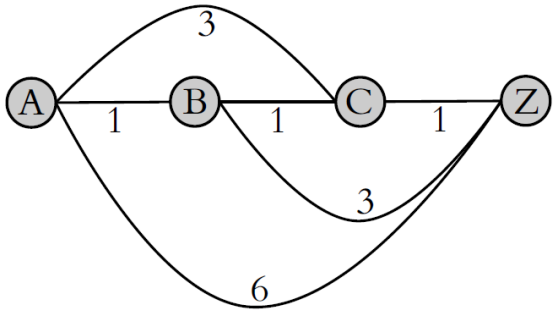


4) In the following network, run

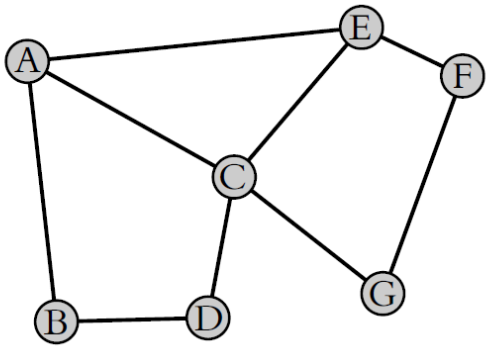
a- The Bhandari algorithm

b- The Suurballe algorithm

to obtain the shortest path between nodes A and Z (You need not run Dijkstra or Bellman-Ford algorithms separately, only use their results at each step).



5) Given the following network topology,

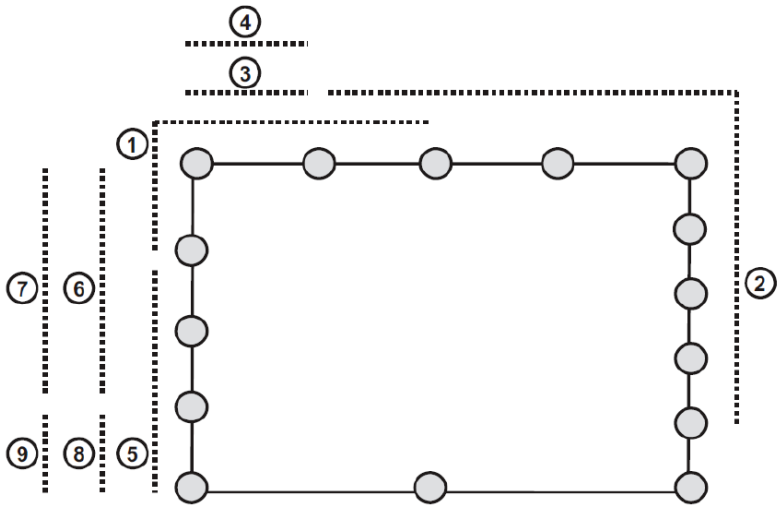


and the following set of lightpaths,

Lightpath ID	Nodelist
1	E-A-C
2	A-C-G-F
3	F-E-C-D
4	B-D-C
5	A-B-D
6	C-G
7	C-D-B

perform the wavelength assignment procedure using
a- first-fit
b- most-used.

6) Given the following network topology and lightpaths,



Perform the wavelength assignment procedure using
a- first-fit
b- most-used.
Consider having only 3 wavelength ($\lambda_1, \lambda_2, \lambda_3$) available at each link, is there any blocked lightpath?