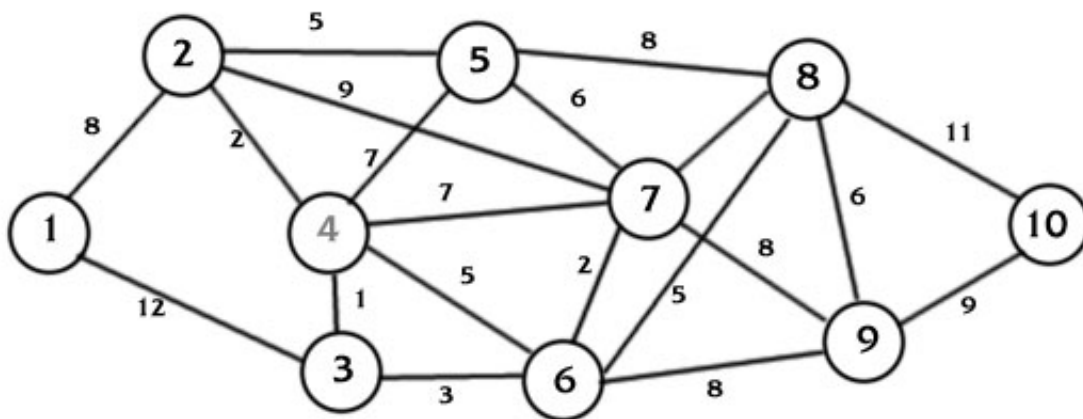


Problem:

The Orange County Transportation Commission is planning to develop a road system linking Mission Viejo City and Fullerton City. Two proposals are under serious considerations;

- A series of six line superstreets linking all 10 Orange County cities between Mission Viejo and Fullerton
- A 10-line freeway extension connecting mission viejo with fullerton which does not necessarily pass through all 10 cities.

Forecasts indicate that either proposal will improve north-south traffic flow through the county and ease traffic congestion on other secondary streets. The proposed transportation corridors are depicted in the following network including mileages between various Orange County Cities.



Superstreets are estimated to cost taxpayers 500.000\$ per mile to build whereas each mile of freeway cost 700.000\$. Although many factors should be considered. If total cost is primary consideration, which system would Orange County taxpayers prefer?

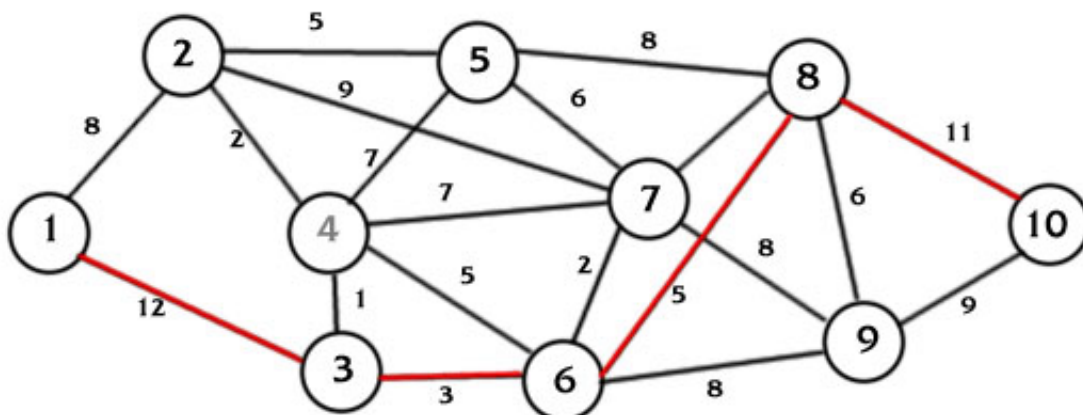
Solution:

a. Variables

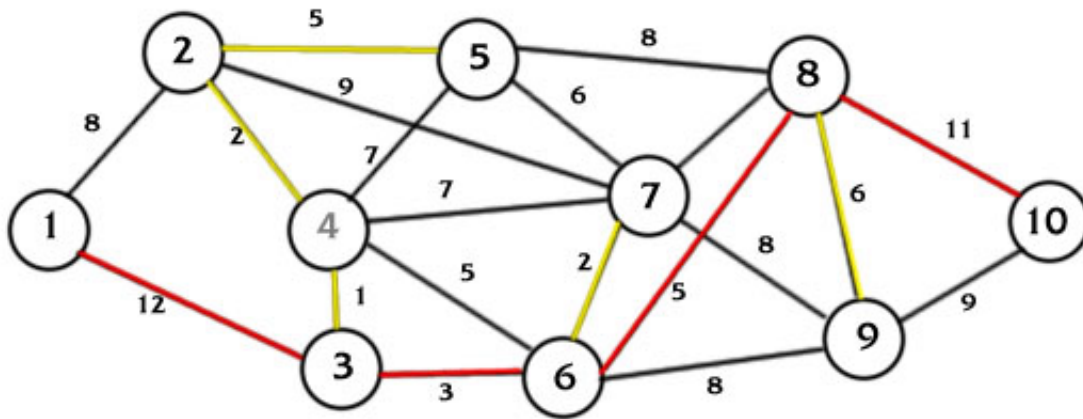
X_{ij} : The selection of road from i to j

b. Solution

Firstly we found the freeway path as a shortest path in excel file [g6-s6-cd6.xls](#) with using solver. And got the following result;



The we have to find the minimum spanning tree to connect the cities; which we got;



The total cost of the ways are;

$$(12+3+5+11)*700.000\$ + (1+2+2+5+6)*500.000\$ = 29.700.000\$$$