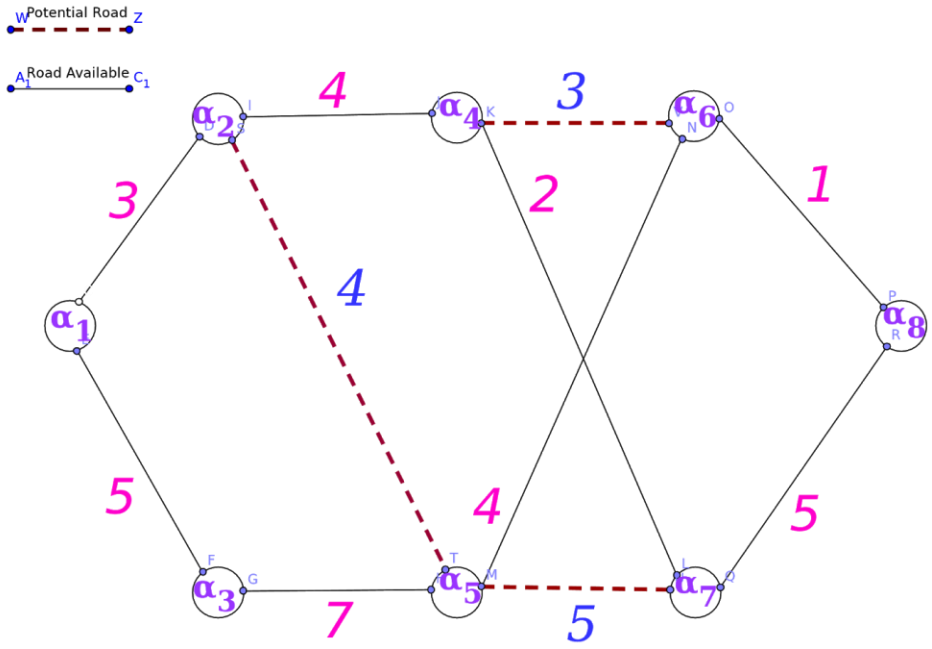
LAB Assignment 9
CS205
Topic: MCST and Shortest Path
Lab Assignment: a,b

a. Let us consider a city network G(V,E), where length of road e represented as l_e. Another new road will be constructed in the next budget. There are proposal of E such roads out of which only one road will be considered for final construction. For all proposed road length is provided. As a lobbyist for city s you wish to advocate for a particular road that would result in maximum decrease in the driving distance between city s and a particular city t. Write an algorithm to determine the road.



Input Format:
Number of nodes: 8
Number of existing edges: 8
In next 8 line take input regarding existing edges along with weight information
Number of proposed/potential edges: 3
In next 3 lines take input regarding proposed edges along with weight information
Enter value of s and t: α_1 and α_8

Output Format: edge to be constructed (α_4 ,α_6)

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b. A contractor is developing a site with n number of towers. He checked feasibility of road connecting each pair of towers. He finds that some pair of towers cannot be connected directly. For other pairs of towers where direct road connectivity is possible connectivity cost varies. He decided to build roads that ensures one path (may not be direct edge) between each pair of towers with minimum cost. Suggest this contractor an optimal strategy so that he can decide which roads needs to be constructed.
Input format: First line presents the number of towers (n), then second line presents number of roads that are feasible (k), next k line represents k roads with v1, v2, w format which presents a road between tower v1 and v2 which will cost w.

Output: first line will print total cost of building all the roads. Second line should present number of roads that will be constructed [let's say number of roads is x]. Next x line should print the details of road in v1, v2, w format.

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