

Solution to 3 problems:

1) Example for such type of scenario is

mapping=[[0,1,400],[1,2,-200],[0,2,300]]

Here according to Dijkstra the shortest path will be 0,2,300 but the correct answer is 200 which will be through 0 to 1 and then from 1 to 2.

2) Example for such type of scenario is

mapping=[[0,1,200],[1,2,-200],[0,2,300]]

3) Example for such type of scenario is:

Let assume initial mapping with negative weights were:

mapping_initial=[[0,1,-500],[1,2,600],[0,2,50]]

We add 500 weights to all to make all weights non-negative:

mapping_final=[[0,1,0],[1,2,1100],[0,2,550]]

Now according to mapping initial 0 to 1 and 1 to 2 was more preferable as it was giving a net weight of 100 but when we change weights of all weights we add 500 2 times while going from 0 to 2 while we add 500 only one time when going directly which changes the answer.

Hence we can't simply add some weights to make all weights negative.