Let's begin at 9:02 PM

L87
Graphs Problem Solving 1

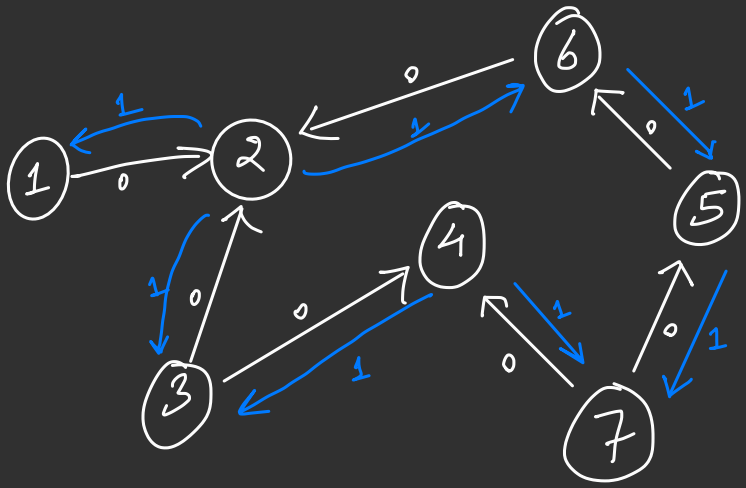
Contest tomorrow at 4:00 PM
to 6:30 PM

Join Discord - https://bit.ly/ly-discord

Practice! Let’s aim for 3 problems.

1. REVERSE

ans = 2



Intuition / Solution

Add reverse edges as weight 1

Apply 0-1 BFS

from 1

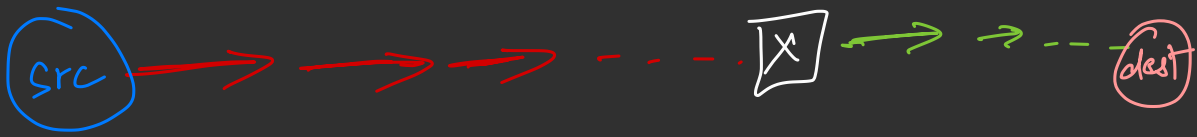
Let’s Implement

2. Red - Green Path

Question

1. Given an undirected, unweighted graph with red/green edges. Find shortest distance between given *source* and *destination* such that:
    - You have to start from the **red** edge and finish at the **green** edge.
    - No self loops, multiple edges.
    - You can switch from **red** to **green** only once

Intuition / Solution



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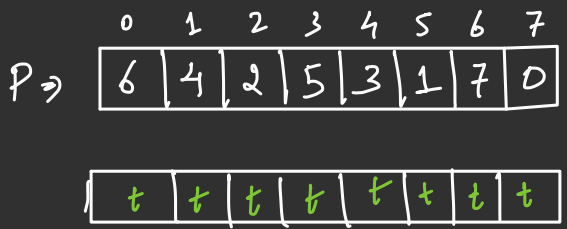
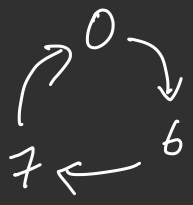
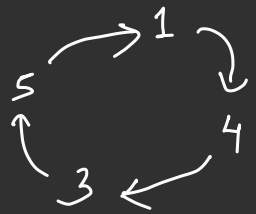
Theory for the next problem

(0 to N-1)

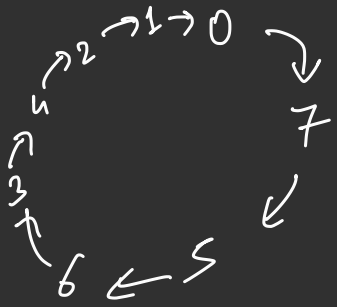
N = 8







	0	1	2	3	4	5	6	7
P ⇒	7	0	1	4	2	6	3	5



3. Square Root

Practice Problem

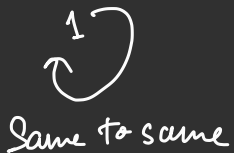
1. Given a permutation *P*, P^2 is defined as:
   a. For each i, P^2[i] = P[P[i]]
2. Given a permutation Q, find a permutation P s.t. P^2 = Q, or print -1 if it's impossible.
3. Example -> [2, 3, 1, 0]

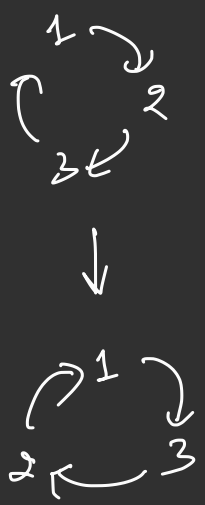
Eg. $P = [2, 3, 1, 0] \Rightarrow P^2 = [1, 0, 3, 2]$

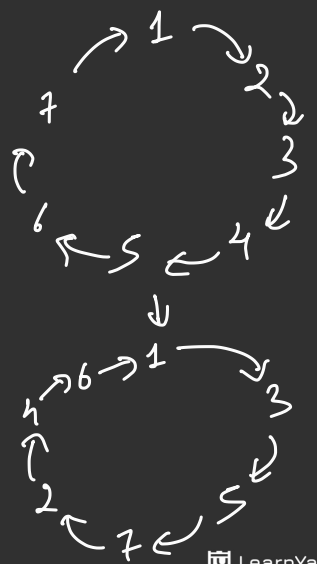
Input $\Rightarrow [1, 0, 3, 2]$

Possible Output $= [2, 3, 1, 0]$

Intuition / Solution

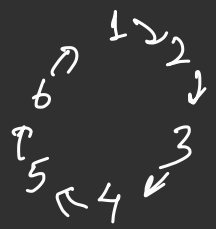


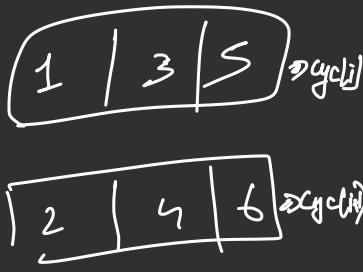




1, 3, 5, 7, 2, 4, 6 $(l = 7)$

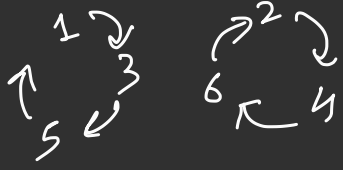
$ans[cyc[i]] = cyc[(i - l/2 + l) \% l]$





ans[cycle[i][id]] = cycle[i+1][id]

ans[cycle[i+1][id]] = cycle[i][id+1]



Let’s Implement

Thank You!

Reminder: Going to the gym & observing the trainer work out can help you know the right technique, but you'll muscle up only if you lift some weights yourself.

So, PRACTICE, PRACTICE, PRACTICE!