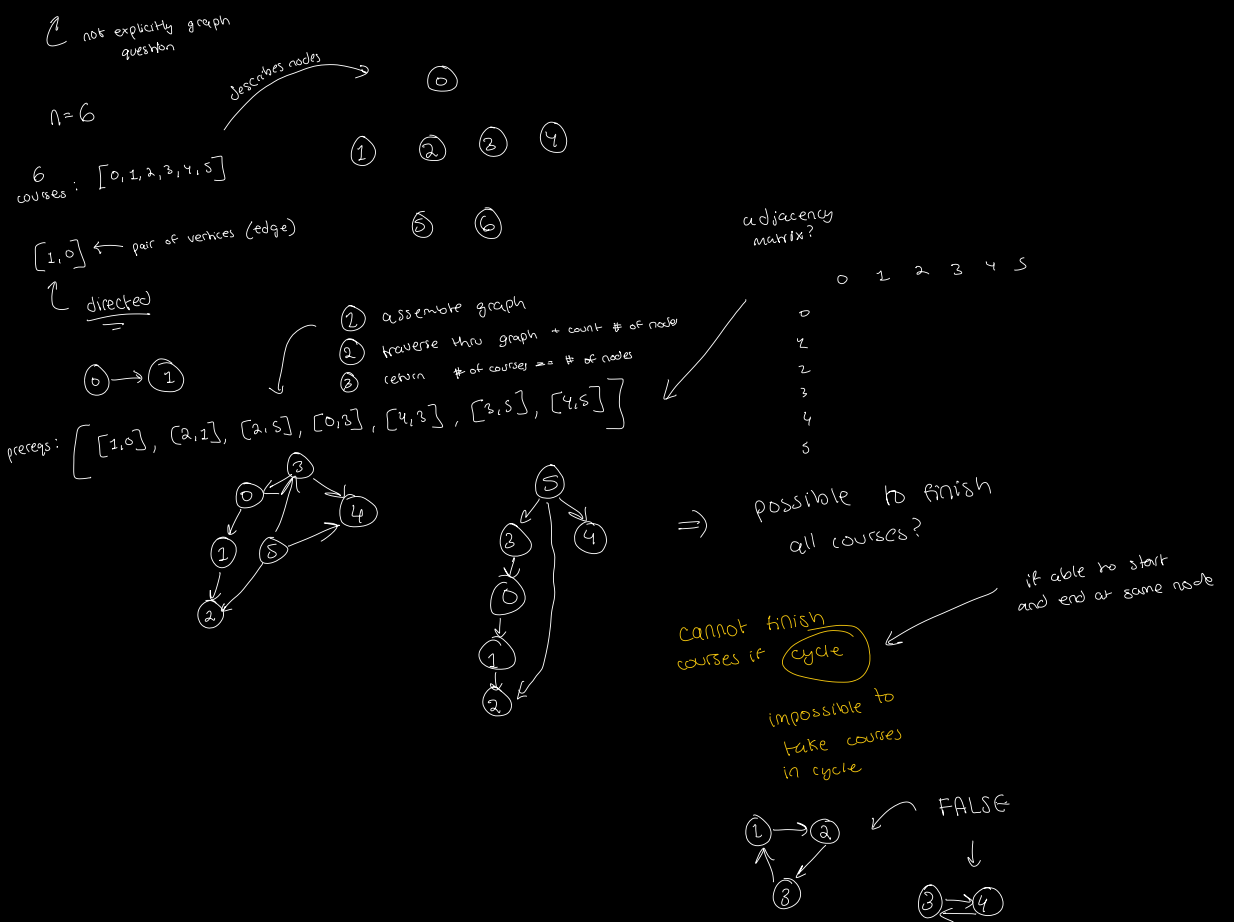
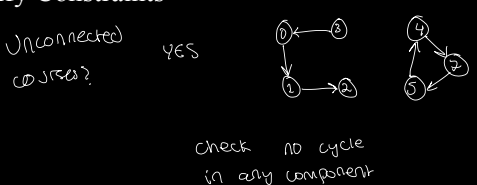
Problem: Total of n courses (0 - n-1), some courses have prereqs
Ex: [1, 0] -> coure: 1, prereq: 0
Given total number of courses and an array of prequisite pairs, return if possible to finish all courses.



Intro:

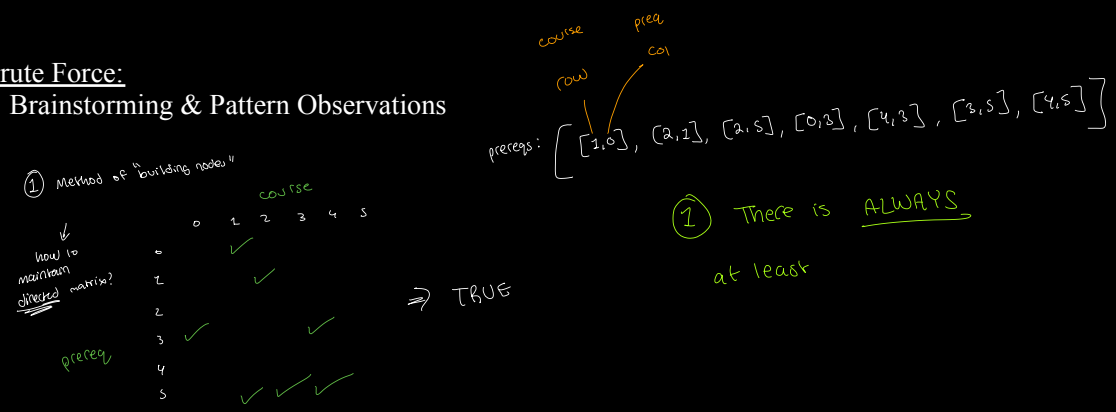
- Verify Constraints

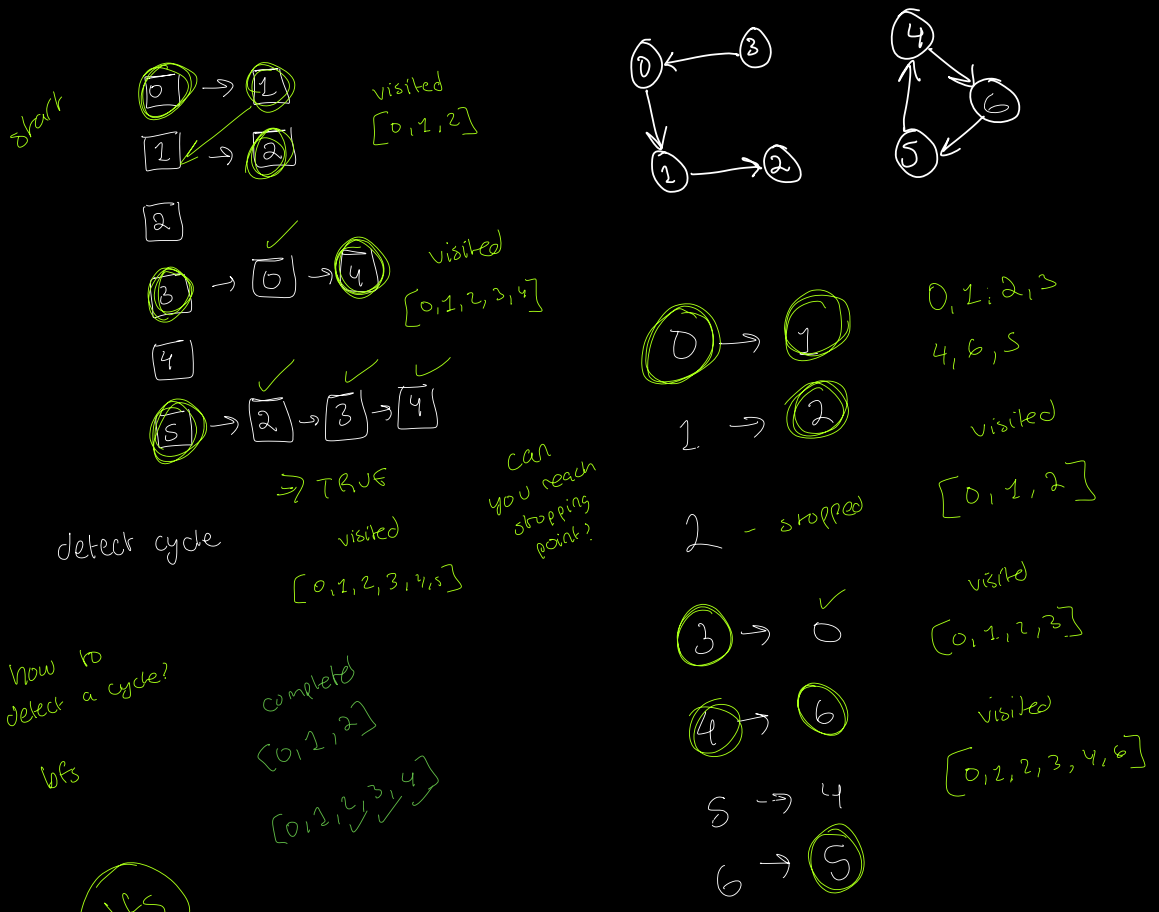


- Create Testcases

Brute Force:

- Brainstorming & Pattern Observations





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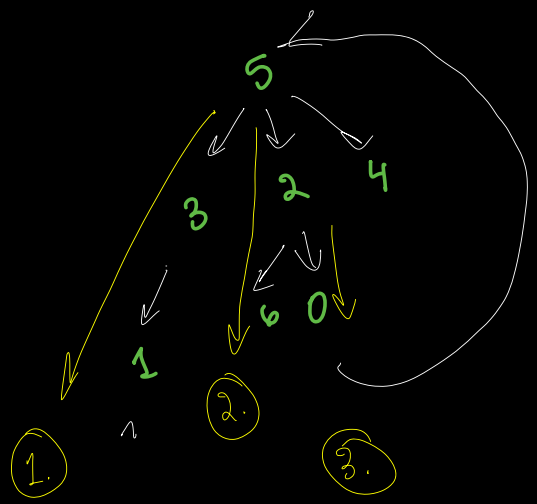
- Pseudocode
- Write code
- Run through testcases
- Analyze time and space complexity

Optimal:

- Brainstorming & Pattern Observations
- Pseudocode
- Write code
- Run through testcases
- Analyze time and space complexity



dfs

Queue: [0]

Visited:

Q: [2, 5, 6]

V: [0, 1, 3, 4]

Queue: [0, 1, 3, 4]

Visited: [0]

Q:

V: [0, 1, 3, 4, 2, 5, 6]

0

1

return false

Q: 0

V:

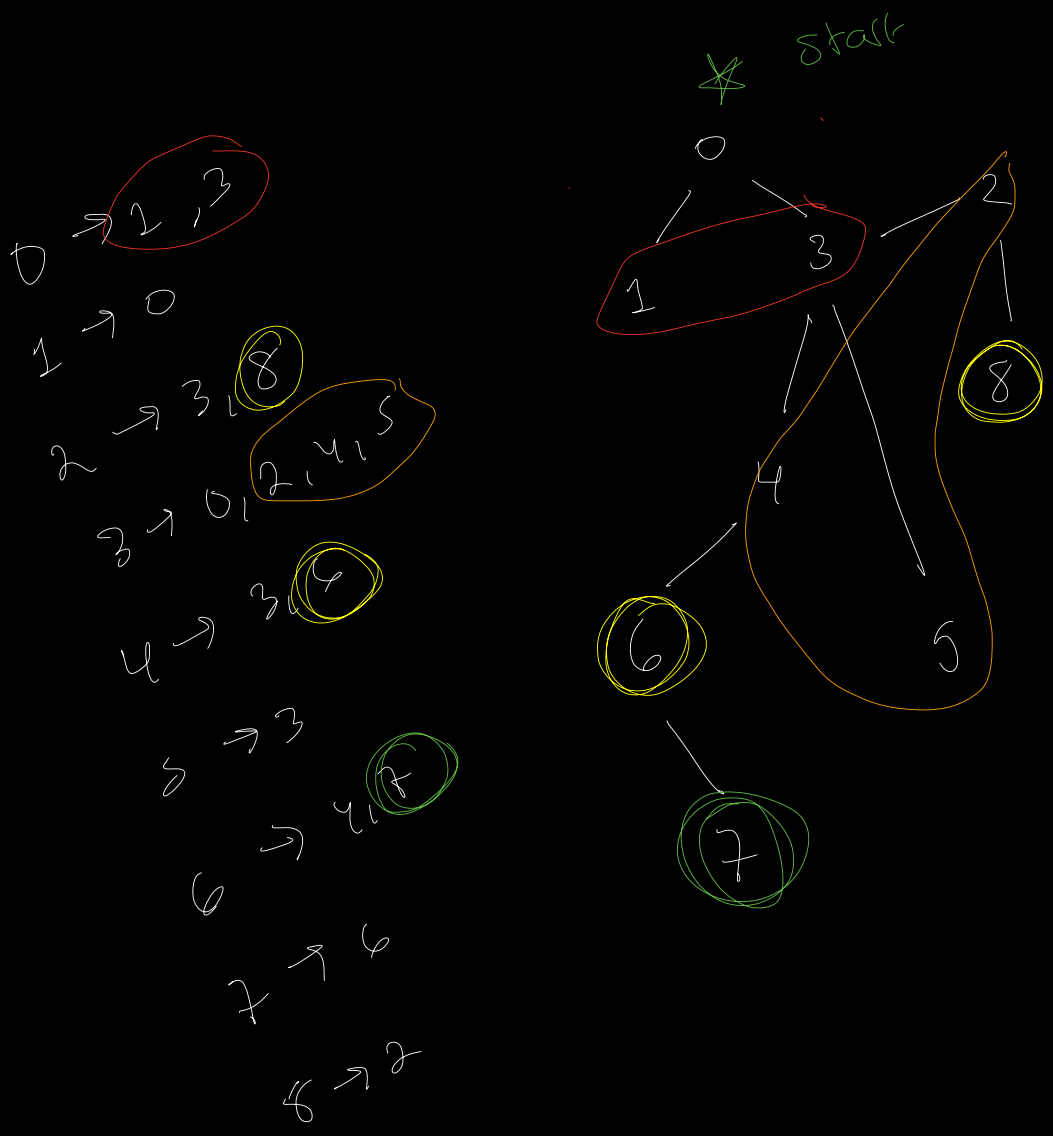
Q 1

V: 0

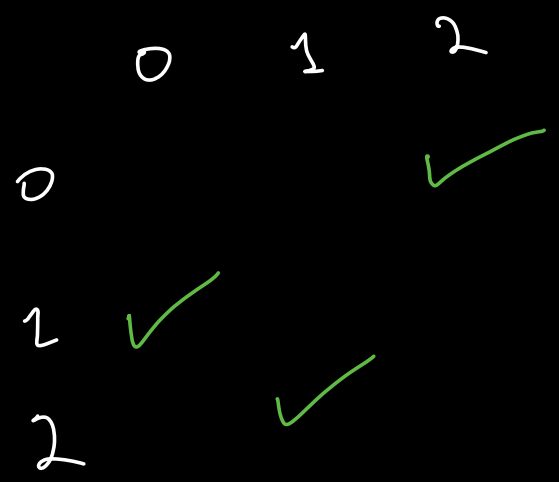
Q: 6

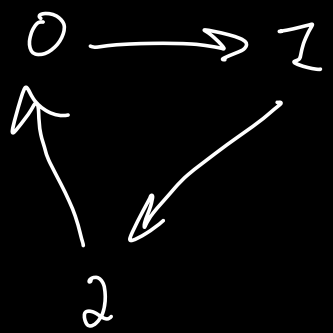
V: [0, 1]

false



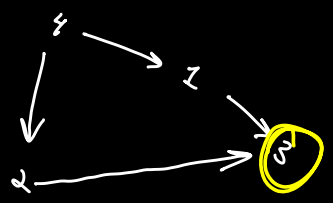
prereqs: [[1,0], [2,1], [2,5], [0,3], [4,3], [3,5], [4,5]]





[1,0], [2,1],

[0,2]



4: 0

[1, 1]

[2, 1]

[3, 2]

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Q: 1 s: 0, 1

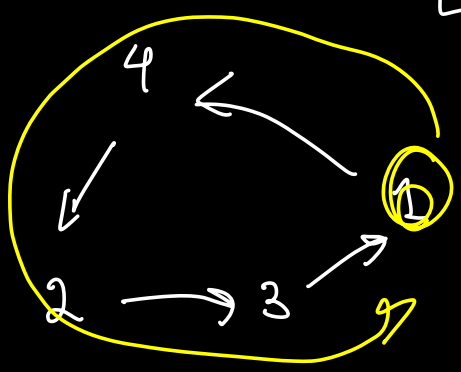
Q: 3 s: 0, 1, 3

Q: 2

course

if 3 in queue:

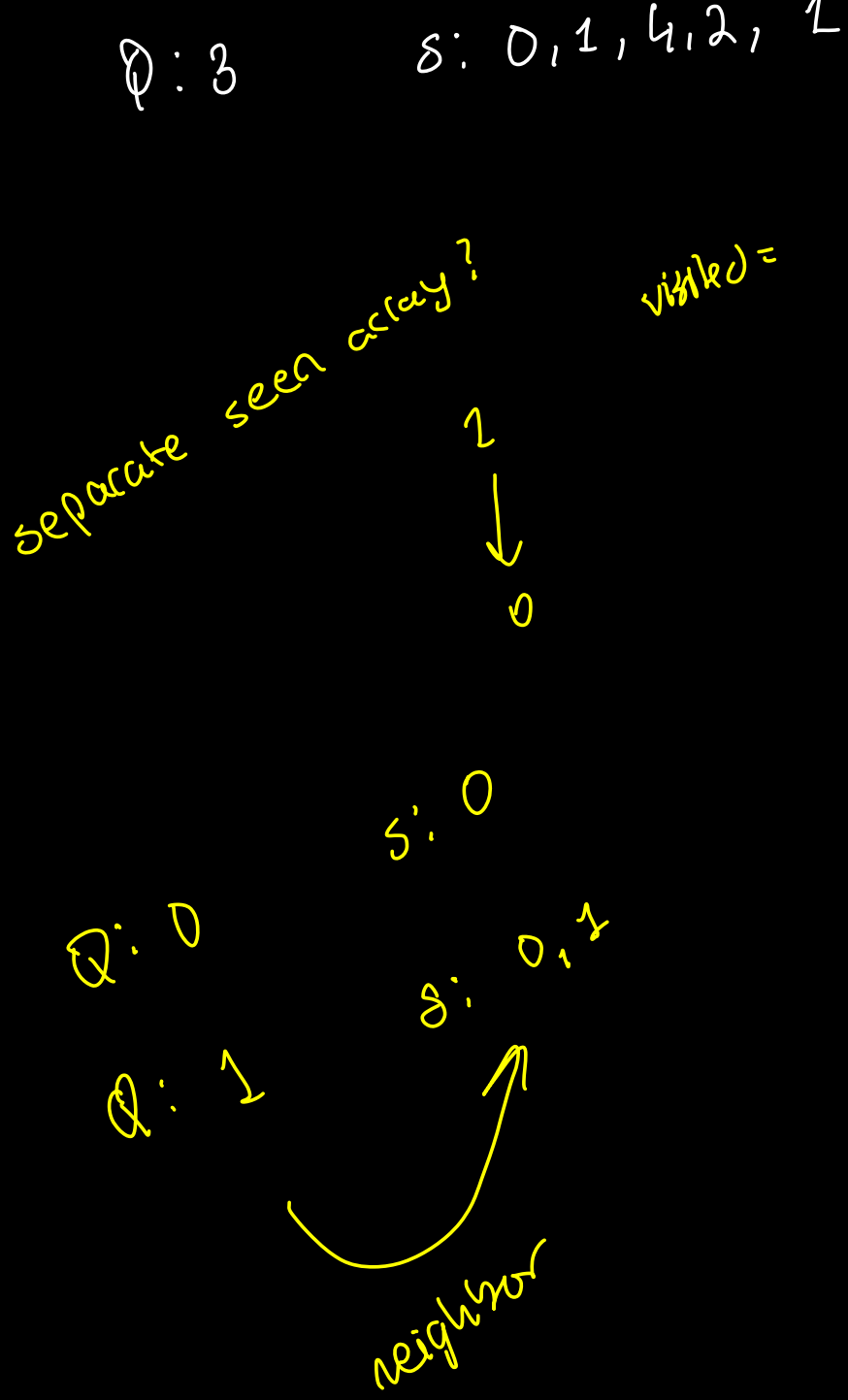
[ ]



Q: 1 s: 0, 1

Q: 4 s: 0, 1, 4

Q: 2 s: 0, 1, 4, 2

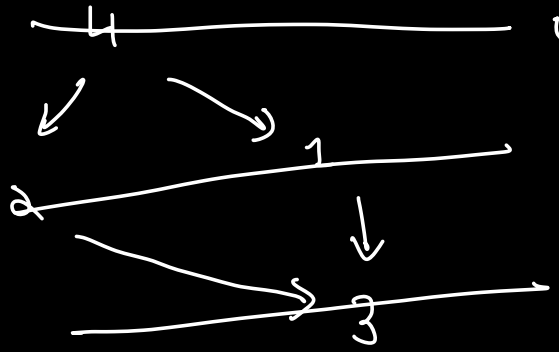

Q: 3
S: 0, 1, 4, 2, 1
separate seen array?
visited =
2
0
S: 0
Q: 0
Q: 1
S: 0, 1
neighbor

reset at every new "island"

seen [i] =

[False, -1]

every node starts at its own level

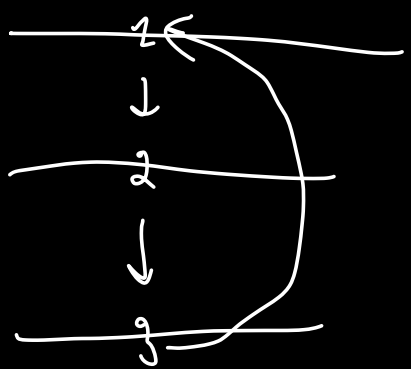


Q: 4

S: 4

if == -1 level += 1

[True, 0]

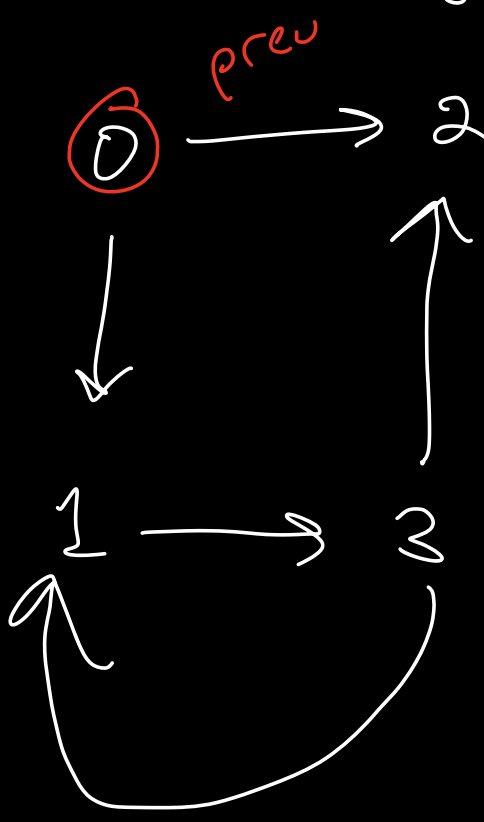


4's children:

(1, 2)

1: seen [False, 1]

2: seen [False, 1]



3: seen [False, 2]

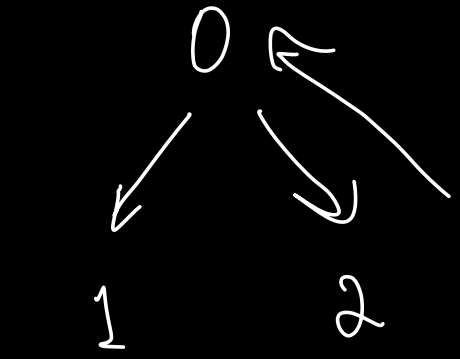
if course in queue:
if seen[course][1] != level: return False

Q: 0 S: 0

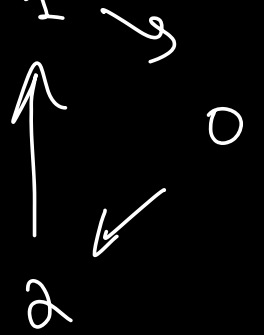
Q: 0,1,2 S: 0,1,2

Q: 3 S: 0,1,2,3

Q 1,2 S: 0,1,2,3

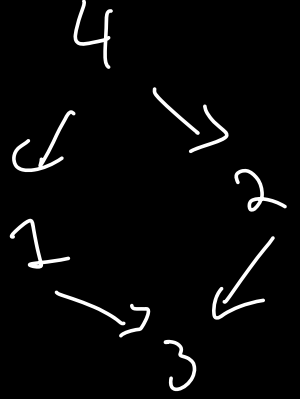


True



[0, 2, 1] 0

false



[1, 3]

[2, 3]

[4, 1, 2, 3]