1059. All Paths from Source Lead to Destination Premium

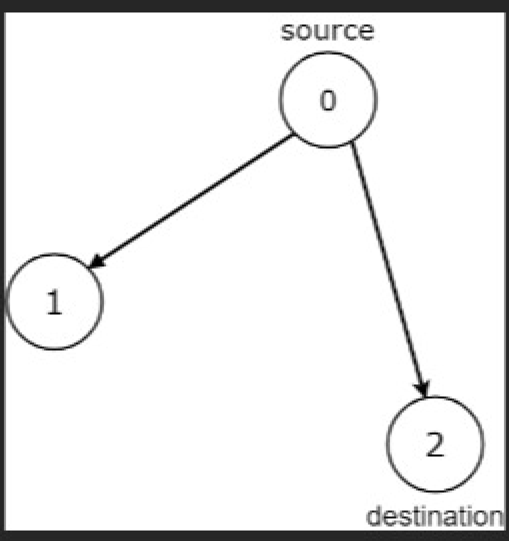
Medium Topics Companies Hint

Given the `edges` of a directed graph where edges[i] = [a_i, b_i] indicates there is an edge between nodes a_i and b_i, and two nodes `source` and `destination` of this graph, determine whether or not all paths starting from `source` eventually, end at `destination`, that is:

- At least one path exists from the `source` node to the `destination` node
- If a path exists from the `source` node to a node with no outgoing edges, then that node is equal to `destination`.
- The number of possible paths from `source` to `destination` is a finite number.

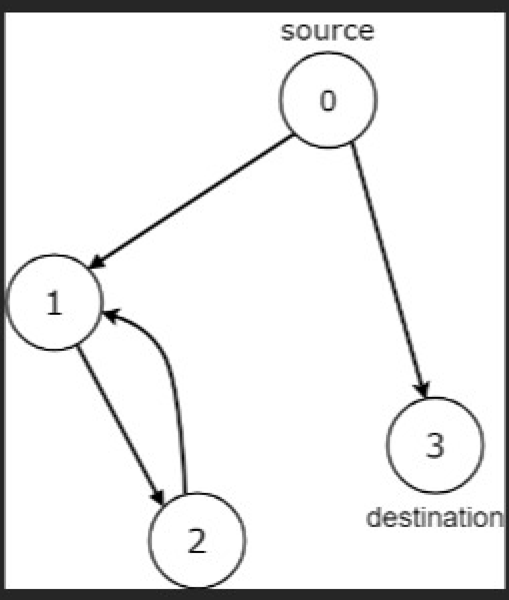
Return `true` if and only if all roads from `source` lead to `destination`.

Example 1:



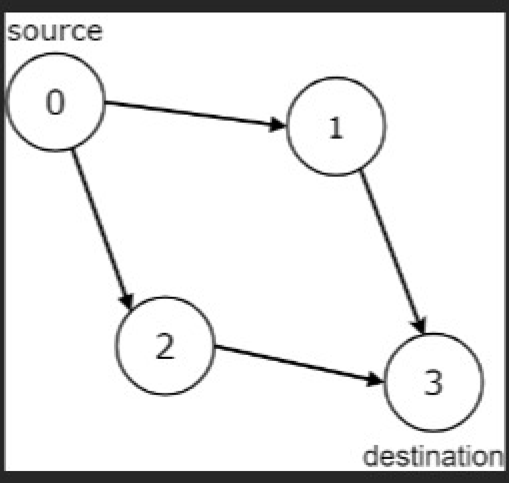
```
Input: n = 3, edges = [[0,1],[0,2]], source = 0, destination = 2
Output: false
Explanation: It is possible to reach and get stuck on both node 1 and node 2.
```

Example 2:



```
Input: n = 4, edges = [[0,1],[0,3],[1,2],[2,1]], source = 0, destination = 3
Output: false
Explanation: We have two possibilities: to end at node 3, or to loop over node 1 and
node 2 indefinitely.
```

Example 3:



```
Input: n = 4, edges = [[0,1],[0,2],[1,3],[2,3]], source = 0, destination = 3
Output: true
```

Constraints:

- 1 <= n <= 10^4
- 0 <= edges.length <= 10^4
- `edges.length == 2`
- 0 <= a_i, b_i <= n - 1
- `0 <= source <= n - 1`
- `0 <= destination <= n - 1`
- The given graph may have self-loops and parallel edges.

Seen this question in a real interview before? 1/5

Yes No

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Hint 1

What if we can reach to a cycle from the source node?

Hint 2

Then the answer will be false, because we eventually get trapped in the cycle forever.

Hint 3

What if the we can't reach to a cycle from the source node? Then we need to ensure that from all visited nodes from source the unique node with indegree = 0 is the destination node.

Discussion (17)