

Problem 3243: Shortest Distance After Road Addition Queries I

Problem Information

Difficulty: **Medium**

Acceptance Rate: 61.83%

Paid Only: No

Tags: Array, Breadth-First Search, Graph

Problem Description

You are given an integer `n` and a 2D integer array `queries`.

There are `n` cities numbered from `0` to `n - 1`. Initially, there is a **unidirectional** road from city `i` to city `i + 1` for all $0 \leq i < n - 1$.

`queries[i] = [ui, vi]` represents the addition of a new **unidirectional** road from city `ui` to city `vi`. After each query, you need to find the **length** of the **shortest path** from city `0` to city `n - 1`.

Return an array `answer` where for each `i` in the range `[0, queries.length - 1]`, `answer[i]` is the `_length of the shortest path_` from city `0` to city `n - 1` after processing the **first** `i + 1` queries.

Example 1:

Input: `n = 5, queries = [[2,4],[0,2],[0,4]]`

Output: `[3,2,1]`

Explanation:



After the addition of the road from 2 to 4, the length of the shortest path from 0 to 4 is 3.



After the addition of the road from 0 to 2, the length of the shortest path from 0 to 4 is 2.



After the addition of the road from 0 to 4, the length of the shortest path from 0 to 4 is 1.

Example 2:

Input: $n = 4$, queries = $[[0,3],[0,2]]$

Output: $[1,1]$

Explanation:



After the addition of the road from 0 to 3, the length of the shortest path from 0 to 3 is 1.



After the addition of the road from 0 to 2, the length of the shortest path remains 1.

Constraints:

$3 \leq n \leq 500$ $1 \leq \text{queries.length} \leq 500$ $\text{queries}[i].\text{length} == 2$ $0 \leq \text{queries}[i][0] < \text{queries}[i][1] < n$ $1 < \text{queries}[i][1] - \text{queries}[i][0]$ * There are no repeated roads among the queries.

Code Snippets

C++:

```
class Solution {
public:
    vector<int> shortestDistanceAfterQueries(int n, vector<vector<int>>& queries)
    {
```

```
}  
};
```

Java:

```
class Solution {  
    public int[] shortestDistanceAfterQueries(int n, int[][] queries) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def shortestDistanceAfterQueries(self, n: int, queries: List[List[int]]) ->  
        List[int]:
```