3604. Minimum Time to Reach Destination in Directed Graph

Solved

Medium Topics Hint

You are given an integer `n` and a **directed** graph with `n` nodes labeled from 0 to `n - 1`. This is represented by a 2D array `edges`, where `edges[i] = [u_i, v_i, start_i, end_i]` indicates an edge from node u_i to v_i that can **only** be used at any integer time `t` such that $start_i$ <= t <= end_i.

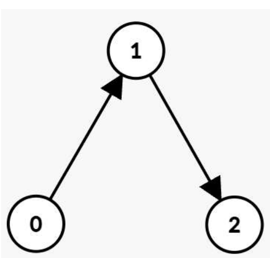
You start at node 0 at time 0.

In one unit of time, you can either:

- Wait at your current node without moving, or
- Travel along an outgoing edge from your current node if the current time `t` satisfies $start_i$ <= t <= end_i.

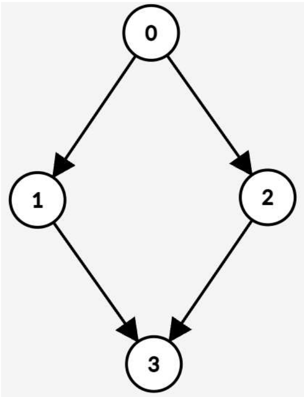
Return the **minimum** time required to reach node `n - 1`. If it is impossible, return `-1`.

Example 1:

> **Input:** n = 3, edges = [[0,1,0,1],[1,2,2,5]]
>
> **Output:** 3
>
> **Explanation:**
>
> 
>
>
> The optimal path is:
>
> - At time `t = 0`, take the edge `(0 → 1)` which is available from 0 to 1. You arrive at node 1 at time `t = 1`, then wait until `t = 2`.
> - At time `t = 2`, take the edge `(1 → 2)` which is available from 2 to 5. You arrive at node 2 at time 3.
>
> Hence, the minimum time to reach node 2 is 3.

Example 2:

> **Input:** n = 4, edges = [[0,1,0,3],[1,3,7,8],[0,2,1,5],[2,3,4,7]]
>
> **Output:** 5
>
> **Explanation:**



The optimal path is:

- Wait at node 0 until time `t = 1`, then take the edge `(0 → 2)` which is available from 1 to 5. You arrive at node 2 at `t = 2`.
- Wait at node 2 until time `t = 4`, then take the edge `(2 → 3)` which is available from 4 to 7. You arrive at node 3 at `t = 5`.

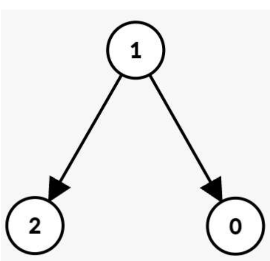
Hence, the minimum time to reach node 3 is 5.

Example 3:

Input: n = 3, edges = [[1,0,1,3],[1,2,3,5]]

Output: -1

Explanation:



- Since there is no outgoing edge from node 0, it is impossible to reach node 2. Hence, the output is -1.

Constraints:

- $1 <= n <= 10^5$
- $0 <= edges.length <= 10^5$
- $edges[i] == [u_i, v_i, start_i, end_i]$
- $0 <= u_i, v_i <= n - 1$
- $u_i != v_i$
- $0 <= start_i <= end_i <= 10^9$

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

Yes No

Accepted 11.013 /23.9K | Acceptance Rate 46.1 %

Topics

Hint 1

Hint 2

Hint 3

Discussion (13)