Contest Duration: 2025-06-14(Sat) 08:00 (http://www.timeanddate.com/worldclock/fixedtime.html?
iso=20250614T2100&p1=248) - 2025-06-14(Sat) 09:40 (http://www.timeanddate.com/worldclock/fixedtime.html?
iso=20250614T2240&p1=248) (local time) (100 minutes)   Back to Home (/home)

Official

D - XOR Shortest Walk (/contests/abc410/tasks/abc410_d) Editorial by

en_translator (/users/en_translator)

This problem can be solved with a technique informally called vertex multiplexing.

Let G be the given graph. Consider the following graph G':

- G' is a graph with 1024 vertices $(1, 0), (1, 1), \ldots, (1, 1023), (2, 0), (2, 1), \ldots, (N, 1023)$.
- G' has a directed edge from vertex (x, s) to vertex $(y, s \text{ XOR } w)$ if and only if G has an edge from vertex x to vertex y with weight w.

A vertex (x, s) is reachable from vertex $(1, 0)$ in G' if and only if there is an walk from vertex 1 to vertex x of weight s in G.

Hence, it is sufficient to check if each of vertices $(N, 0), (N, 1), \ldots, (N, 1023)$ is reachable from vertex $(1, 0)$. Since the graph G' has $1024N$ vertices and $1024M$ edges, the problem can be solved in $O((N + M) \max W_i)$ time by actually constructing the graph and performing BFS (Breadth-First Search) or DFS (Depth-First Search) on it.

posted: 3 days ago

last update: 3 days ago

2025-06-16 (Mon)
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