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Algorithms Lab

Exercise – *Odd Route*

An odd person devised an odd game, where the objective boils down to the following: given a directed graph with non-negative weights on edges, find the shortest odd path between two vertices. A path is called odd if it contains an odd number of edges and its total weight is odd.

Note the following:

- "Shortest" is meant in terms of the total weight of the path.
- The graph can have loops and parallel edges.
- The path does not need to be simple, i.e., it can have repeating vertices and edges.

Input The first line of the input contains the number of test cases $1 \leq t \leq 50$. t test cases follow. Each of them describes a graph G, starting with a line containing $1 \leq n \leq 10^5, 0 \leq m \leq 2 \cdot 10^5$, the number of vertices and edges of G. The next line contains two vertices $0 \leq s, t < n$. The next m lines describe edges of G: each of them contains numbers $0 \leq s_i, t_i < n, 1 \leq w_i \leq 10^3$ denoting the source, target and weight of the i-th edge.

All numbers on a single line are single-space separated and there are no leading or trailing spaces.

Output For every testcase you should output a single line with the total weight of the shortest odd path from s to t in G. If such a path does not exist, output `no` on a single line.

Points There are two test sets, for a total of 100 points:

1. For the first test set, worth 60 points, you may assume $n \leq 250$ as well as $s_i < t_i$ for each i.
2. There are no additional restrictions for the second test set, worth 40 points.

Sample Input

```
2
2 1
0 1
0 1 2
3 4
0 2
0 1 1
1 0 2
0 2 2
0 2 11
```

Sample Output

```
no
5
```

Hint Find a solution for a case when $w_i = 1$ for all i and generalize it.