Problem D. Travelling cost

Time limit	500 ms
Mem limit	1572864 kB
Code length Limit	50000 B
OS	Linux

The government of **Spoj_land** has selected a number of locations in the city for road construction and numbered those locations as 0, 1, 2, 3, ... 500.

Now, they want to construct roads between various pairs of location (say **A** and **B**) and have fixed the cost for travelling between those pair of locations from either end as **W unit**.

Now, Rohit being a curious boy wants to find the minimum cost for travelling from location **U** (source) to **Q** number of other locations (destination).

Input

First line contains **N** ,the number of roads that government constructed.

Next N line contains three integers **A** ,**B**, and **W**.

A and B represent the locations between which the road was constructed and W is the fixed cost for travelling from A to B or from B to A.

Next line contains an integer **U** from where Rohit wants to travel to other locations.

Next line contain **Q**, the number of queries (finding cost) that he wants to perform.

Next **Q** lines contain an integer **V** (destination) for which minimum cost is to be found **from U**.

Output

Print the required answer in each line.

If he can't travel from location U to V by any means then, print '**NO PATH**' without quotes.

Example

Input	Output
7 0 1 4 0 3 8 1 4 1 1 2 2 4 2 3 2 5 3 3 4 2 0 4 1 4 5 7	4 5 9 NO PATH

Constraints

1 <= N <= 500

0 <= A, B <= 500

1 <= W <= 100

0 <= U, V <= 500

1 <= Q <= 500

Explanation

Query #1: 0 → 1: cost = 4

Query #2: 0 → 4: 0 → 1 → 4, cost = 4 + 1 = 5

Query #3: 0 → 5: 0 → 1 → 2 → 5, cost = 4 + 2 + 3 = 9

Query #4: 0 → 7: no path exist between 0 and 7