Floyd : City of Blinding Lights

Problem Statement

Given a directed, weighted graph, consisting of N nodes and there are edges ,of specified length between some of them in the graph.

Given Q questions, inquring the shortest distance between a queried pair of nodes in the graph.

Answer all these questions as quickly as possible !

Input Format

First line has two integers N, denoting the number of nodes in the graph and M, denoting the number of edges in the graph.
The next M lines each consist of three space separated integers $x\ y\ r$, where x and y denote the two nodes between which the *directed* edge $(x->y)$ exists, r denotes the length of the edge between the corresponding edges.
The next line contains a single integer Q, denoting number of queries.
The next Q lines each, contain two space separated integers a and b, denoting the node numbers specified according to the question.

Constraints
$2 \leq N \leq 400$
$1 \leq M \leq \frac{N \times (N-1)}{2}$
$1 \leq Q \leq 10^5$
$1 \leq x, y, \leq N$
$1 \leq r \leq 350$

If there are edges between the same pair of nodes with different weights, the last one (most recent) is to be considered as the only edge between them.

Output Format

Print Q lines, each containing a single integer, specifying the shortest distance between the nodes specified for that query in the input.

If the distance between a pair of nodes is infinite (not reachable), then print -1 as the shortest distance.

Sample Input

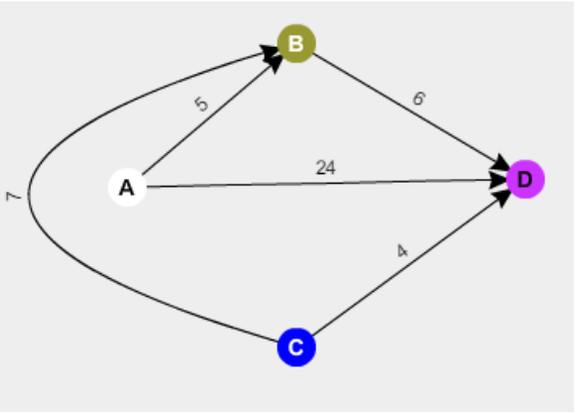
```
4 5
1 2 5
1 4 24
2 4 6
3 4 4
3 2 7
3
1 2
3 1
1 4
```

Sample Output

```
5
-1
11
```

Explanation

The graph given in the test case is shown as :



- The nodes A,B,C and D denote the 1,2,3 and 4 node numbers.

The shortest paths for the 3 queries are :

- **A->B** (Direct Path is shortest with weight 5)
- **-1** (There is no way of reaching node 1 from node 3, hence unreachable)
- **A->B->D** (Indirect path is shortest with weight (5+6) = 11 units, the direct path is longer with 24 units length)