



# Floyd : City of Blinding Lights

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Problem

Submissions

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Discussions

Editorial

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, inquiring 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 ( $x \rightarrow y$ ) 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 :

Graph

- 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)

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Max Score: 75



Difficulty: Hard

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Current Buffer (saved locally, editable)  

Java 7  

```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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☐ Test against custom input

Run Code

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