



4346 - Traffic Network

Asia - Ho-Chi-Minh-City - 2008/2009

The city traffic network consists of n nodes numbered from 1 to n and m one-way roads connecting pairs of nodes. In order to reduce the length of the shortest path between two different critical nodes s and t , a list of k two-way roads are proposed as candidates to be constructed.

Your task is to write a program to choose one two-way road from the proposed list in order to minimize the resulting shortest path between s and t .

Input

The input file consists of several data sets. The first line of the input file contains the number of data sets which is a positive integer and is not bigger than 20. The following lines describe the data sets.

For each data set, the first line contains five positive integers n ($n \leq 10000$), m ($m \leq 100000$), k ($k < 300$), s ($1 \leq s \leq n$), t ($1 \leq t \leq n$) separated by space. The i -th line of the following m lines contains three integers d_i , c_i , l_i separated by space, representing the length l_i ($0 < l_i \leq 1000$) of the i -th one-way road connecting node d_i to c_i . The j -th line of the next k lines contains three positive integers u_j , v_j and q_j ($q_j \leq 1000$) separated by space, representing the j -th proposed two-way road of length q_j connecting node u_j to v_j .

Output

For each data set, write on one line the smallest possible length of the shortest path after building the chosen one two-way road from the proposed list. In case, there does not exist a path from s to t , write '-1'.

Sample Input

```
1
4 5 3 1 4
1 2 13
2 3 19
3 1 25
3 4 17
4 1 18
1 3 23
2 3 5
2 4 25
```

Sample Output

```
35
```

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