Dijkstra's Algorithm

Your task is to implement Dijkstra's algorithm which finds the shortest path in a weighted directed graph with n vertices and m edges.

You should implement an algorithm that works in time $O(n^2 + m)$.

Input

The first line contains integer z $(1 \leqslant z \leqslant 2 \cdot 10^9)$ – the number of data sets. Each data set is as follows:

The first line contains number n $(1 \leqslant n \leqslant 1000)$ of vertices and number m $(1 \leqslant m \leqslant 1000000)$ of edges of the input graph. Each of the remaining lines contains three numbers u v and w representing an oriented edge of weight w $(1 \leqslant w \leqslant 1000)$ oriented from u to v.

Output

The weight of the shortest path from vertex 0 to vertex $n - 1$. You should output -1 in the case when such a path does not exist.

Example

For the input: the output is:

```
2                                       3
4 6                                     -1
0 2 1
0 1 3
0 3 7
2 1 1
2 3 3
1 3 1
5 6
0 2 1
0 1 3
0 3 7
2 1 1
2 3 3
1 3 1
```