Maximum augmenting sequence of spanning trees

Let G be an unempty simple undirected connected weighted graph, $G = (V, E, w)$, w: $E \rightarrow \{0, 1, 2, 3, ...\}$.
In this problem, we suppose that the weights of all edges of G are mutually different.

At first, we describe the problem less formally. Let T_1 be a spanning tree of G. The central part of the problem is to create another spanning tree of G, say T_2, which differs a little from T_1 and which we will call an **augment of T_1**. The process of creating T_2 consists of the following:
1. Find a cheap edge e_1 in T_1.
2. Find an expensive edge e_2, which belongs to G but not to T_1.
3. Remove the cheap edge e_1 from T_1 and insert the expensive edge e_2 into T_1.

Steps 1.− 3. must be completed in such way that the resulting subgraph, now called T_2, will again be a spanning tree of G. Also, the weight of T_2 must be bigger than the weight of T_1 and maximum possible. As there can be more pairs of edges (e_1, e_2) which satisfy these conditions, we additionally demand that the weight $w(e_1)$ must also be maximum possible among those pairs of edges.

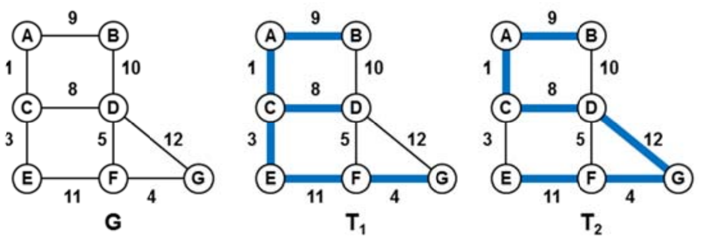

Image 1a. Graph G and its spanning trees T_1 and T_2.
T_2 is an augment of T_1.

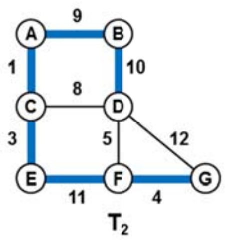

Image 1b. T_2 is not an augment of T_1.

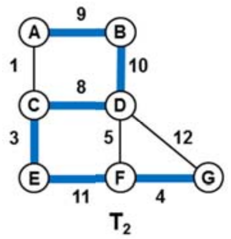

Image 1c. T_2 is not an augment of T_1.

Example. In the image above there is a highlighted spanning tree T_1 of the graph G. To create a spanning tree T_2 (also highlighted) which is an augment of T_1 we chose the pair of edges ({C, E}, {D, G}). The weight of T_2 is then 45. This can be seen in the image 1a. We cannot choose, for example, the pair ({C, D}, {B, D}) because the weight of T_2 would be only 38 as can be seen in the image 1b. Also, as illustrated in the image 1c, we cannot choose the pair ({A, C}, {B, D}) because although the weight of T_2 would be 45, which is maximum possible, the weight of the edge {A, C} is less than the weight of the first edge of the pair ({C, E}, {D, G}) used in the image 1a.

For the sake of completeness we provide also a formal definition of the augment tree. You may skip this section if the informal description is sufficient for you.

Let T be a spanning tree of G. We say that an ordered pair of edges (e_1, e_2) $\in E \times E$ is a ***T*-augmenting pair of edges** if both following conditions hold:
1. $e_1 \in E(T)$, $e_2 \in E(G) - E(T)$.
2. The difference $w(e_2) - w(e_1)$ is positive and maximum possible.

We say that a T-augmenting pair of edges (e_1, e_2) is a **proper *T*-augmenting pair** if the value of $w(e_1)$ is maximum among all T-augmenting pairs of edges.

Let T_1 and T_2 be two spanning trees of a G. We say that T_2 is an **augment of T_1** if there is a proper T_1-augmenting pair (e_1, e_2) such that $E(T_2) = \{E(T_1) - e_1\} \cup e_2$.

We say that a sequence (T_1, T_2, ..., T_D), ($D > 0$) of spanning trees of G is a **maximum augmenting sequence of *G*** when both following conditions hold:
1. T_1 is a minimum spanning tree of G.
2. T_k is a augment of T_{k-1}, for $k = 2, 3, ..., D$.

Note that for some values of D the maximum augmenting sequence might be undefined.

The task

We have to find the weight of the last element of the maximum augmenting sequence of the given graph G. We consider the weight of a graph to be the sum of weights of all its edges.

Input

The first line of input contains three positive integers *N*, *M*, *D* separated by space. The integers represent the number of vertices, the number of edges and the value *D* specified above. Next, there are *M* lines, each specifies one edge by three integers *a*, *b*, *c* separated by space. The integers *a* and *b* represent the edge $\{a, b\}$ and *c* represent its weight. We suppose that the vertices of the graph are labeled 0,1, . .. $N-1$. Input values satisfy $D \leq N \leq 2000$.

Output

The output consists of a single line containing the weight of the last element of the maximum augmenting sequence $(T_1, T_2, ..., T_D)$ of the input graph. The sequence is always defined.

Example 1

Input
```
10 13 3
0 1 6
1 2 10
2 3 4
3 4 5
5 6 9
6 7 1
7 8 8
8 9 3
0 5 13
1 6 7
2 7 2
3 8 11
4 9 12
```

Output
```
64
```

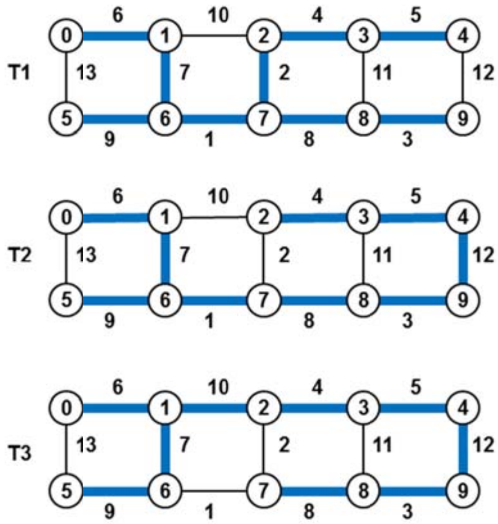

Image 2. The picture shows the maximum augmenting sequence (T_1, T_2, T_3) of the input graph in Example 1. The edges of the spanning trees are highlighted.

Example 2

Input
```
7 21 7
2 0 0
3 2 3
4 2 5
5 0 7
6 4 9
4 1 11
3 0 13
4 3 15
3 1 17
5 1 19
1 0 21
2 1 23
4 0 25
6 5 27
5 4 29
6 3 31
5 2 33
5 3 35
6 2 37
6 1 39
6 0 41
```

Output
```
214
```