Problem J
Evacuation

Time Limit: 2 seconds
Memory Limit: 512 Megabytes

Problem description

In a dark room, at approximately 11:55PM, Captain couldn't sleep and begins thinking about possible consequences of a nuclear catastrophe in his city. As its mayor, he is acquainted with the following facts. First, he knows that there are exact **N** people living in the city, each of them is in their own houses. Second, there are **M** roads connecting the houses. For each road, he knows how much time to travel from one house to the other house that it connects. Finally, Captain knows that there are **K** houses with nuclear bunkers. Each of these houses has one bunker that can accommodate up to a certain number of people. With all these in his mind, Captain makes the following question: "How much time does it take to evacuate all the residents of the city?"

Please help Captain answer the question given the following assumptions:

(i) the residents can move optimally (they know which way is the shortest),
(ii) multiple residents can move on a same road simultaneously in different directions,
(iii) there is at least one path connecting any two houses.

Note that, after the evacuation, every resident ends up in one of the nuclear bunkers.

Input

- The first line contains the integers N, M, and K ($1 \le N \le 10^5$, $1 \le M \le 3 \times 10^5$, $1 \le K \le 17$) which respectively represent the number of residents, the number of roads, and the number of nuclear bunkers. The houses are made with the numbers from 1 to N.
- In each of the following M lines, there are three integers A, B, and C ($1 \le A, B \le N$, $A \ne B$, $1 \le C \le 10^9$), which means that the time to travel from the house A to the house B is C (units of time).
- Each of the next K lines contains two integers X and Y ($1 \le X \le N$, $1 \le Y \le 10^9$) which indicate that the bunker of the house X can accommodate up to Y people. The total capacity of all the bunkers is greater than or equal to N.

Output

- A single line that prints out the minimum units of time required to evacuate all the residents of the city.

Example:

Input	Output
7 8 3 1 2 5 2 3 3 3 4 5 1 4 1 4 5 7 5 6 2 6 7 1 4 7 4 3 3 7 3 6 2	5