World War and Virus

Assignment 4
Data Structures and Algorithms

Problem Statement: The real threat to the world is a cyber war and the means to ignite it is a virus. DSA TAs - Aanshul and Kishan have programmed a virus to crawl through the network at IIIT. The faculty gets worried and wants to develop a network to counter the virus crawl. The virus is a large file and hence there is a need to minimize network bandwidth.

You are given the network blueprint with all connections in the system. Every connection has an associated bandwidth (Example: 1Gbps). Each connection is of type u v w, where there is a bidirectional link between u and v with bandwidth w. Your task as a site reliability engineer is to remove some (or no) connections such that the total bandwidth is minimized and the faculties can still be connected with each other.

But as we know, there always is an egotist leader and so do we have one in the faculty. Doland Dawat (our egotist faculty with a greed to keep some connections) wants to keep exactly k connections (for himself) out of total m connections.

You need to minimize the total bandwidth of the network fulfilling the tantrums of the network head (Mr. Dawat).

Note
Total Bandwidth: Sum of all connection bandwidth in system! Also, each faculty is given a system. So, words faculty and system can be used interchangeably and meaningfully. The system number for Mr. Dawat is 1.

Input
First line contains three integers n (total systems in the network) and m (number of connections) and k (number of exact connections Mr. Dawat want).
Next m lines contains the blueprint of system
i-th of the next m lines contains 3 integers u_i, v_i, w_i.

Output
Print the total bandwidth of the virus-resilient network if it is possible or -1 if not.

Constraints
$1 \leq n \leq 5000$
$0 \leq m \leq 10^5$
$0 \leq k \leq 5000$
$1 \leq u_i, v_i \leq n$
$1 \leq w_i \leq 10^5$

Time Limit: 2 sec
Memory Limit: 256 MB

Sample Test Case

Input	Output
4 4 2 1 2 3 2 3 1 3 4 2 1 4 5	9