Problem C. Cartesian MST

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

Let G and H be two weighted undirected simple graphs. We define the *cartesian product* of the two graphs, $G \square H$, as the graph whose vertex set is the cartesian set product of the vertex sets of the two graphs $V(G) \times V(H)$ and in which there is an edge between vertices (u_1, v_1) and (u_2, v_2) if and only if:

- $v_1 = v_2$ and there is an edge (u_1, u_2) in G. In this case, the edge$((u_1, v_1), (u_2, v_2))$ in $G \square H$ has the same weight as the edge (u_1, u_2) in G.
- or $u_1 = u_2$ and there is an edge (v_1, v_2) in H. In this case, the edge$((u_1, v_1), (u_2, v_2))$ in $G \square H$ has the same weight as the edge (v_1, v_2) in H.

You are given two connected graphs G and H. Compute the total weight of the minimum spanning tree of $G \square H$.

Input

The first line contains four integers n_1, m_1, n_2, m_2 ($2 \le n_1, n_2 \le 10^5$; $1 \le m_1, m_2 \le 10^5$): the number of vertices of G, the number of edges of G, the number of vertices of H, and the number of edges of H, respectively.

Each of the next m_1 lines contains three integers u_i, v_i, w_i ($0 \le u_i, v_i \le n_1 - 1$; $1 \le w_i \le 10^8$), describing an edge of G between vertices u_i and v_i with weight w_i.

Each of the next m_2 lines contains three integers u_i, v_i, w_i ($0 \le u_i, v_i \le n_2 - 1$; $1 \le w_i \le 10^8$), describing an edge of H between vertices u_i and v_i with weight w_i.

It is guaranteed that graphs G and H are simple and connected. Recall that a graph is *simple* if there are no edges between a vertex and itself, and there is at most one edge between any two vertices.

Output

Output one integer: the weight of the minimum spanning tree of $G \square H$.

Example

standard input	standard output
4 4 3 2 0 1 3 1 2 2 2 3 2 3 0 5 0 1 1 1 2 1	15