Problem C. Clique Festival

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

John has a graph with n vertices labeled with integers $1, \ldots, n$. Initially, there are no edges in the graph. Then John modifies the graph k times, each time adding a clique to the graph. He chooses an integer a and a set S which is a non-empty subset of the set of integers $1, 2, \ldots, n$. For each unordered pair (i, j) such that $i, j \in S$ and $i \neq j$, John adds an undirected edge between the vertices i and j with weight a. It is possible that parallel edges appear in John's graph.

The distance between vertices u and v is defined as follows. Denote $d_{u,v}$ as the minimum weight of the edge between vertices u and v, or ∞ if there is no such edge. Then $\text{dist}(u, v) = \min\limits_{i_1,\ldots,i_p} \left(d_{u,i_1} + d_{i_1,i_2} + \ldots + d_{i_{p-1},i_p} + d_{i_p,v}\right)$. In other words, the distance is the length of the shortest path between u and v.

Your task is to calculate $\sum\limits_{i=1}^{n-1} \sum\limits_{j=i+1}^{n} dist(i, j)$. It is guaranteed that all summands are finite.

Input

The first line contains two integers n and k ($1 \le n \le 100\,000$, $1 \le k \le 18$). The next k lines contain the descriptions of the added cliques. Each of these lines contains integers a ($1 \le a \le 10^7$), $|S|$ ($1 \le |S| \le n$), and then $|S|$ integers $s_1, \ldots, s_{|S|}$ ($1 \le s_i \le n$, all s_i are distinct). These are the weight of edges in the clique, the number of vertices in the clique, and the labels of these vertices, respectively.

The sum of all $|S|$ in the input does not exceed 300 000.

Output

Output a single integer: the answer to the problem.

Examples

standard input	standard output
10 3 10 5 1 2 3 4 5 10 5 6 7 8 9 10 1 2 5 6	625
3 2 1 2 1 2 1 2 2 3	4