Problem A
Make it connected

Time limit: 3 seconds
Memory limit: 2048 megabytes

Problem Description

Given an undirected connected graph with n vertices and m undirected edges. The vertices are numbered from 1 to n. Each edge has a color c_i and a weight w_i. There are k possible colors, which are numbered from 1 to k. Each color is associated with a weight p_i.

Your objective is to choose a subset of edges while ensuring the graph remains connected. The *cost* of this chosen subset is calculated as the sum of the w_i values of all selected edges. However, if any edge of a particular color j is included in the subset, an additional cost of p_j is added specifically for that color j. Note that p_j is added to the cost at most once for any subset of edges.

Your goal is to determine the minimum cost required to maintain the connectivity of the graph.

Input Format

The first line of the input contains three integers n, m and k. The second line of input contains n space-separated integers $p_1, p_2, \ldots, p_k$. Each of the following m lines contains four integers u_i, v_i, w_i and c_i, where the i-th line denotes that there is an undirected edge from vertex u_i to v_i in the graph.

Output Format

Output the minimum *cost* for a subset to maintain the connectivity of the graph.

Technical Specification

- $2 \leq n \leq 1000$
- $n - 1 \leq m \leq 5 \times 10^5$
- $1 \leq k \leq 14$
- $1 \leq p_i \leq 10^9$ for $i = 1, 2, \ldots, k$
- $1 \leq u_i, v_i \leq n$ and $u_i \neq v_i$ for $i = 1, 2, \ldots, m$
- $1 \leq w_i \leq 10^9$ for $i = 1, 2, \ldots, m$
- $1 \leq c_i \leq k$ for $i = 1, 2, \ldots, m$
- It is guaranteed that the input graph is connected.

Scoring

1. (50 points) $k = 1$

2. (50 points) $k \leq 8$
3. (50 points, bonus) No additional constraints.

Sample Input 1

```
4 7 3
7 3 5
1 3 1 3
2 4 1 2
2 4 1 3
3 4 5 1
1 2 4 1
1 4 10 3
3 1 2 2
```

Sample Output 1

```
17
```

Sample Input 2

```
6 5 6
987654321 988776655 938198371 988736281 938193712 992817394
1 4 100 1
4 2 200 2
3 4 300 3
1 6 400 4
4 5 500 6
```

Sample Output 2

```
4896184522
```

Sample Input 3

```
5 7 4
5 3 6 4
1 2 4 1
1 3 3 2
1 4 6 3
1 5 5 4
5 3 2 3
2 4 5 2
3 4 1 1
```

Sample Output 3

```
24
```

Sample Input 4

```
5 7 1
123
1 2 4 1
1 3 3 1
1 4 6 1
1 5 5 1
5 3 2 1
2 4 5 1
3 4 1 1
```

Sample Output 4

```
133
```