

F. Drivers Dissatisfaction

time limit per test: 4 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

In one kingdom there are n cities and m two-way roads. Each road connects a pair of cities, and for each road we know the level of drivers dissatisfaction — the value w_i .

For each road we know the value c_i — how many lamziks we should spend to reduce the level of dissatisfaction with this road by one. Thus, to reduce the dissatisfaction with the i -th road by k , we should spend $k \cdot c_i$ lamziks. And **it is allowed for the dissatisfaction to become zero or even negative**.

In accordance with the king's order, we need to choose $n - 1$ roads and make them the *main roads*. An important condition must hold: it should be possible to travel from any city to any other by the *main roads*.

The road ministry has a budget of S lamziks for the reform. The ministry is going to spend this budget for repair of some roads (to reduce the dissatisfaction with them), and then to choose the $n - 1$ *main roads*.

Help to spend the budget in such a way and then to choose the main roads so that the total dissatisfaction with the *main roads* will be as small as possible. The dissatisfaction with some roads can become negative. It is not necessary to spend whole budget S .

It is guaranteed that it is possible to travel from any city to any other using existing roads. Each road in the kingdom is a two-way road.

Input

The first line contains two integers n and m ($2 \leq n \leq 2 \cdot 10^5$, $n - 1 \leq m \leq 2 \cdot 10^5$) — the number of cities and the number of roads in the kingdom, respectively.

The second line contains m integers w_1, w_2, \dots, w_m ($1 \leq w_i \leq 10^9$), where w_i is the drivers dissatisfaction with the i -th road.

The third line contains m integers c_1, c_2, \dots, c_m ($1 \leq c_i \leq 10^9$), where c_i is the cost (in lamziks) of reducing the dissatisfaction with the i -th road by one.

The next m lines contain the description of the roads. The i -th of this lines contain a pair of integers a_i and b_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$) which mean that the i -th road connects cities a_i and b_i . All roads are two-way oriented so it is possible to move by the i -th road from a_i to b_i , and vice versa. It is allowed that a pair of cities is connected by more than one road.

The last line contains one integer S ($0 \leq S \leq 10^9$) — the number of lamziks which we can spend for reforms.

Output

In the first line print K — the minimum possible total dissatisfaction with *main roads*.

In each of the next $n - 1$ lines print two integers x, v_x , which mean that the road x is among main roads and the road x , after the reform, has the level of dissatisfaction v_x .

Consider that roads are numbered from 1 to m in the order as they are given in the input data. The edges can be printed in arbitrary order. If there are several answers, print any of them.

Examples

input

```
6 9
1 3 1 1 3 1 2 2 2
4 1 4 2 2 5 3 1 6
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1 2
1 3
2 3
2 4
2 5
3 5
3 6
4 5
5 6
7

output

0
1 1
3 1
6 1
7 2
8 -5

input

3 3
9 5 1
7 7 2
2 1
3 1
3 2
2

output

5
3 0
2 5