F - Paint Tree 2 Editorial (/contests/abc416/tasks/abc416_f/editorial) 🇯🇵 / 🇬🇧

Time Limit: 3 sec / Memory Limit: 1024 MiB

Score : 525 points

Problem Statement

You are given a tree T with N vertices numbered from 1 to N, and an integer K. The i-th edge $(1 \le i \le N - 1)$ connects vertices U_i and V_i. Also, vertex i $(1 \le i \le N)$ has an integer A_i written on it. Initially, all vertices are colored white.

You perform the following action at least 0 times and at most K times:

- Choose a path in tree T such that all vertices on the path are colored white. Then, color all vertices on the chosen path black.

Find the maximum possible sum of integers written on vertices that are colored black after finishing the actions.

Constraints

- $2 \le N \le 2 \times 10^5$
- $1 \le K \le 5$
- $1 \le A_i \le 10^9$
- $1 \le U_i < V_i \le N$
- The given graph is a tree.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$N \quad K$$
$$A_1 \quad A_2 \quad \ldots \quad A_N$$
$$U_1 \quad V_1$$
$$U_2 \quad V_2$$
$$\vdots$$
$$U_{N-1} \quad V_{N-1}$$

Output

Output the answer.

Sample Input 1 Copy

Copy
```
4 1
1 2 4 8
1 2
1 3
1 4
```

Sample Output 1 Copy

Copy
```
13
```

If you choose the path with vertices 3 and 4 as endpoints, you can color vertices $1, 3, 4$ black. In this case, the sum of integers written on the colored vertices is $1 + 4 + 8 = 13$.

You cannot make the sum of integers written on black vertices greater than 13, so output 13.

Sample Input 2 Copy

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

Sample Output 2 <kbd>Copy</kbd>

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```
27
```
</div>

For example, you can make the sum of integers written on black vertices 27 by performing operations as follows:

- Choose the path with vertices 4 and 5 as endpoints. Color vertices $2, 4, 5$ black.
- Choose the path with vertices 6 and 7 as endpoints. Color vertices $3, 6, 7$ black.

You cannot make the sum of integers written on black vertices greater than 27, so output 27.

Sample Input 3 <kbd>Copy</kbd>

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```
11 3
1 9 1 3 7 9 10 9 7 3 4
7 8
2 7
5 7
3 4
7 11
1 9
1 10
3 6
1 7
3 7
```
</div>

Sample Output 3 <kbd>Copy</kbd>

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```
52
```
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