# Fight for 'Superpower'

Time Limit: 1 second

The fight for Superpower status in Byteland is growing interesting between the Republic of Vasya and Republic of Petya. You are a data analyst who needs to determine information about that region which can enable either nations to gain an upper hand. You are given a map of the different states (which is in the form of an undirected tree) and which nation holds power in each state (either Vasya or Petya). You need to find the maximum *dominance* value of a set of *connected* states. Dominance of a set of states is defined as the absolute difference between the number of states Vasya controls and the number of states Petya controls.

## Input

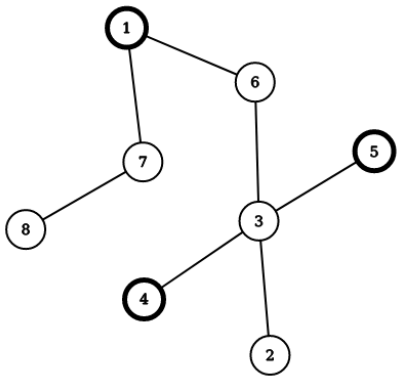
The first line contains $\boldsymbol{n}$ , the total number of states.
Next line contains $\boldsymbol{n}$ values where each value is either **0** or **1**. **0** denotes that Vasya controls the $\boldsymbol{i^{th}}$ state & **1** denotes that Petya controls the $\boldsymbol{i^{th}}$ state.
Next $\boldsymbol{n-1}$ lines contain integers $\boldsymbol{u_i}$ and $\boldsymbol{v_i}$ representing the $\boldsymbol{i^{th}}$ road which connects states $\boldsymbol{u_i}$ and $\boldsymbol{v_i}$.

## Output

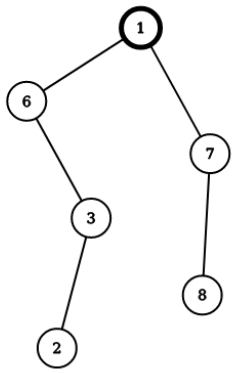
Print a single number which is the maximum dominance.

## Constraints

- $1 \leq \boldsymbol{n} \leq 10^5$
- $1 \leq \boldsymbol{u_i}$ , $\boldsymbol{v_i} \leq \boldsymbol{n}$




(a) Graph for the first sample case.




(b) Answer for the first sample case

## Sample Cases

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**Input :**

8
1 0 0 1 1 0 0 0
7 1
3 5
1 6
4 3
6 3
2 3
7 8

**Output :**

4

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## Sample Case Explanations

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In the graph, the bold nodes denote Petya's states and the other nodes are Vasya's states. The maximum dominance we can attain is 4 by choosing the connected set {1, 2, 3, 6, 7, 8}.