

# CCC '22 S5 - Good Influencers

Time limit: 3.0s Memory limit: 1G

## Canadian Computing Competition: 2022 Stage 1, Senior #5

There are  $N$  ( $N \geq 2$ ) students in a computer science class, with distinct student IDs ranging from 1 to  $N$ . There are  $N - 1$  friendships amongst the students, with the  $i^{\text{th}}$  being between students  $A_i$  and  $B_i$  ( $A_i \neq B_i$ ,  $1 \leq A_i \leq N$  and  $1 \leq B_i \leq N$ ). Each pair of students in the class are either friends or socially connected. A pair of students  $a$  and  $b$  are socially connected if there exists a set of students  $m_1, m_2, \dots, m_k$  such that

- $a$  and  $m_1$  are friends,
- $m_i$  and  $m_{i+1}$  are friends (for  $1 \leq i \leq k - 1$ ), and
- $m_k$  and  $b$  are friends.

Initially, each student  $i$  either intends to write the CCC (if  $P_i$  is  Y) or does not intend to write the CCC (if  $P_i$  is  N). Initially, at least one student intends to write the CCC, and at least one student does not intend to write the CCC.

The CCC has allocated some funds to pay some students to be influencers for the CCC. The CCC will repeatedly choose one student  $i$  who intends to write the CCC, pay them  $C_i$  dollars, and ask them to deliver a seminar to all of their friends, and then all of their friends will intend to write the CCC.

Help the CCC determine the minimum cost required to have all of the students intend to write the CCC.

## Input Specification

The first line contains the integer  $N$ .

The next  $N - 1$  lines each contain two space-separated integers,  $A_i$  and  $B_i$  ( $1 \leq i \leq N - 1$ ).

The next line contains  $N$  characters,  $P_1 \dots P_N$ , each of which is either  Y or  N.

The next line contains  $N$  space-separated integers,  $C_1 \dots C_N$ .

The following table shows how the available 15 marks are distributed.

Marks Awarded	Number of Students	Payment	Additional Constraints
5 marks	$2 \leq N \leq 2\,000$	$1 \leq C_i \leq 1\,000$	$A_i = i$ and $B_i = i + 1$ for each $i$
7 marks	$2 \leq N \leq 2\,000$	$1 \leq C_i \leq 1\,000$	None
3 marks	$2 \leq N \leq 200\,000$	$1 \leq C_i \leq 1\,000$	None

## Output Specification

Output the minimum integer number of dollars required to have all of the students to intend to write the CCC.

## Sample Input 1

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```
4
1 2
2 3
3 4
YNYN
4 3 6 2
```

## Output for Sample Input 1

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```
6
```

## Explanation of Output for Sample Input 1

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The CCC should pay \$6 to student 3 to deliver a seminar to their friends (students 2 and 4), after which all 4 students will intend to write the CCC.

## Sample Input 2

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```
15
1 5
5 2
2 15
15 4
2 10
8 3
3 1
1 6
11 6
12 6
11 9
11 14
12 7
13 7
NNYYYNYYNNNNNNN
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

## Output for Sample Input 2

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6

## Explanation of Output for Sample Input 2

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One optimal strategy is for the CCC to ask students 5, 1, 6, 11, 7, and 2 to deliver seminars, in that order, paying them \$ 1 each.