



USACO 2019 DECEMBER CONTEST, SILVER PROBLEM 3. MILK VISITS

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English (en) ▼

Farmer John is planning to build N ($1 \leq N \leq 10^5$) farms that will be connected by $N - 1$ roads, forming a tree (i.e., all farms are reachable from each-other, and there are no cycles). Each farm contains a cow, whose breed is either Guernsey or Holstein.

Farmer John's M friends ($1 \leq M \leq 10^5$) often come to visit him. During a visit with friend i , Farmer John will walk with his friend along the unique path of roads from farm A_i to farm B_i (it may be the case that $A_i = B_i$). Additionally, they can try some milk from any cow along the path they walk. Since most of Farmer John's friends are also farmers, they have very strong preferences regarding milk. Some of his friends will only drink Guernsey milk, while the remainder will only drink Holstein milk. Any of Farmer John's friends will only be happy if they can drink their preferred type of milk during their visit.

Please determine whether each friend will be happy after visiting.

SCORING:

- Test cases 2-5 satisfy $N \leq 10^3$, $M \leq 2 \cdot 10^3$.

INPUT FORMAT (file milkvisits.in):

The first line contains the two integers N and M .

The second line contains a string of length N . The i th character of the string is 'G' if the cow in the i th farm is a Guernsey, or 'H' if the cow in the i th farm is a Holstein.

The next $N - 1$ lines each contain two distinct integers X and Y ($1 \leq X, Y \leq N$), indicating that there is a road between farms X and Y .

The next M lines contain integers A_i , B_i , and a character C_i . A_i and B_i represent the endpoints of the path walked during friend i 's visit, while C_i is either G or H if the i th friend prefers Guernsey milk or Holstein milk.

OUTPUT FORMAT (file milkvisits.out):

Print a binary string of length M . The i th character of the string should be '1' if the i th friend will be happy, or '0' otherwise.

SAMPLE INPUT:

```
5 5
HHGHG
1 2
2 3
2 4
1 5
1 4 H
1 4 G
1 3 G
1 3 H
5 5 H
```

SAMPLE OUTPUT:

```
10110
```

Here, the path from farm 1 and farm 4 involves farms 1, 2, and 4. All of these contain Holsteins, so the first friend will be satisfied while the second one will not.

Problem credits: Spencer Compton

Contest has ended. No further submissions allowed.
