

### F. AB Tree

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Kilani and Abd are neighbors for 3000 years, but then the day came and Kilani decided to move to another house. As a farewell gift, Kilani is going to challenge Abd with a problem written by their other neighbor with the same name Abd.



The problem is:

You are given a connected tree rooted at node 1.

You should assign a character `a` or `b` to every node in the tree so that the total number of `a`'s is equal to  $x$  and the total number of `b`'s is equal to  $n - x$ .

Let's define a string for each node  $v$  of the tree as follows:

- if  $v$  is root then the string is just one character assigned to  $v$ ;
- otherwise, let's take a string defined for the  $v$ 's parent  $p_v$  and add to the end of it a character assigned to  $v$ .

You should assign every node a character in a way that **minimizes the number of distinct strings** among the strings of all nodes.

#### Input

The first line contains two integers  $n$  and  $x$  ( $1 \leq n \leq 10^5$ ;  $0 \leq x \leq n$ ) — the number of vertices in the tree the number of `a`'s.

The second line contains  $n - 1$  integers  $p_2, p_3, \dots, p_n$  ( $1 \leq p_i \leq n$ ;  $p_i \neq i$ ), where  $p_i$  is the parent of node  $i$ .

It is guaranteed that the input describes a connected tree.

#### Output

In the first line, print the minimum possible total number of distinct strings.

In the second line, print  $n$  characters, where all characters are either `a` or `b` and the  $i$ -th character is the character assigned to the  $i$ -th node.

Make sure that the total number of `a`'s is equal to  $x$  and the total number of `b`'s is equal to  $n - x$ .

If there is more than one answer you can print any of them.

#### Example

input	Copy
9 3 1 2 2 4 4 3 1	
output	Copy

#### Codeforces Round #699 (Div. 2).

Contest is running
01:32:18
Contestant


#### → Submit?

Language: GNU G++14 6.4.0

Choose file: 

파일 선택

선택된 파일 없음

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

#### → Score table

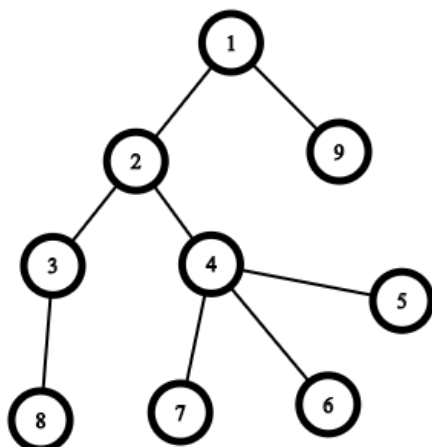
	Score
<a href="#">Problem A</a>	446
<a href="#">Problem B</a>	669
<a href="#">Problem C</a>	1338
<a href="#">Problem D</a>	1784
<a href="#">Problem E</a>	2230
<a href="#">Problem F</a>	2676
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

\* If you solve problem on 00:27 from the first attempt

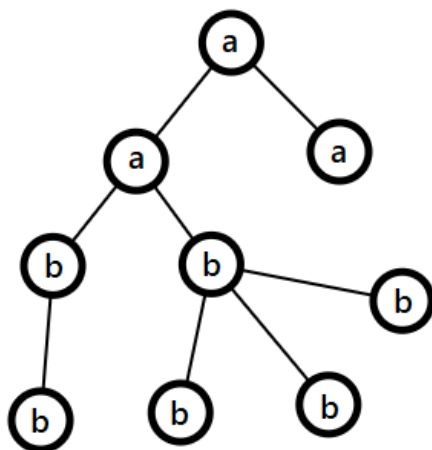
4  
aabbabbba

**Note**

The tree from the sample is shown below:



The tree after assigning characters to every node (according to the output) is the following:



Strings for all nodes are the following:

- string of node 1 is: a
- string of node 2 is: aa
- string of node 3 is: aab
- string of node 4 is: aab
- string of node 5 is: aabb
- string of node 6 is: aabb
- string of node 7 is: aabb
- string of node 8 is: aabb
- string of node 9 is: aa

The set of unique strings is  $\{a, aa, aab, aabb\}$ , so the number of distinct strings is 4.

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