Lucy and the Flowers

- SUBMIT
- ALL SUBMISSIONS

Problem code: DECORATE

Read problems statements in Mandarin Chinese and Russian.

The staff of one of the most famous ChefLand's restaurants have just received the news! A delegation from the neighbouring country is going to visit the restaurant. The staff want to make this visit exciting and pleasant. Lucy is also a member of the staff and among all the things that the staff want to do, her assignment is to arrange the flowers on the tables.

Generally, there are **26** kinds of flowers, a small latin letter corresponds to a single kind. Equal letters correspond to equal kinds. Different letters correspond to different kinds. According to the old ChefLand tradition, one can make a bouquet from some flowers only if it is a substring of some magic string **T**. ChefLands make bouquets in such a manner that the order of flowers in them is important. The restaurant has a tradition to decorate a single table with **N**, not necessary different, bouquets. Their order matters.

Some decorations look really similar. Generally, two arrangements (let's call them **A** and **B**) are similar if**B** is a cyclic shift of **A**, or **B** is a reversed cyclic shift of **A**. For example the sequence ("aba", "c", "b") is a cyclic shift of a sequence ("b", "aba", "c"), and the sequence ("c", "b", "a", "e", "d") is a reversed cyclic shift of a sequence ("a", "b", "c", "d", "e").

Now Lucy thinks that the most beautiful bouquets are "symmetric" ones. The bouquet is "symmetric" if the string that corresponds to the arrangement of flowers in it is a palindrome (it reads from left to right the same as from right to left).

So, she thinks that the decoration of the table will be especially beautiful if all the bouquets in it are "symmetric". But then, Lucy had realized that the number of such decorations of the tables can be less than the number of guests. She doesn't want to decorate two tables in a similar manner, so she would like to know the number of distinct decorations such that no two tables looks similar.

Input

The first line of input consists of a single string **T**.

The second line of input consists of a single integer **N**.

Output

Output the number of distinct decorations.

Constraints

1 ≤ |**T**| ≤ 100000;

1 ≤ **N** ≤ 600;

String **T** consists only of lowercase English letters.

Example

Input:

aba
4

Output:

21

Query on a tree VI

- SUBMIT
- ALL SUBMISSIONS

Problem code: QTREE6

Read problems statements in Mandarin Chinese and Russian.

You are given a tree (an acyclic undirected connected graph) with **n** nodes. The tree nodes are numbered from 1 to **n**. Each node has a color, white or black. All the nodes are black initially. We will ask you to perfrom some instructions of the following form:

- **0 u**: ask for how many nodes are connected to **u**, two nodes are connected if all the node on the path from **u** to **v** (inclusive **u** and **v**) have the same color.
- **1 u**: toggle the color of **u** (that is, from black to white, or from white to black).

Input

The first line contains a number **n** that denotes the number of nodes in the tree ($1 \le n \le 10^5$). In each of the following **n-1** lines, there will be two numbers (**u**, **v**) that describes an edge of the tree ($1 \le u, v \le n$). The next line contains a number **m** denoting number of operations we are going to process ($1 \le m \le 10^5$). Each of the following **m** lines describe an operation (**t**, **u**) as we mentioned above($0 \le t \le 1$, $1 \le u \le n$).

Output

For each query operation, output the corresponding result.

Example

Input 1:

```
5
5
1 2
1 3
1 4
1 5
3
0 1
1 1
0 1

1 2
```

Output 1:

```
5
1
```

Input 2:

```
7
```

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

Output 2:

```
7
3
3
```

Art in Digital Age

- SUBMIT
- ALL SUBMISSIONS

Problem code: SMPAINT

Read problems statements in Mandarin Chinese and Russian.

Being a CS student, Ron really don't understand why he has to take a compulsory course called "Art in Digital Age".

The objective of this course from what his school said is to help the CS students release the stress by doing something new other from coding/programming. The problem is Ron really love coding and he doesn't care about other stuff. This course even gives him

more stress. However, like it or not Ron still need to try his best not to let this course ruins his great GPA. Can you help him with his first assignment which is described below.

In this assignment, Ron is given an **N**×**N** pixels image called sample image. Ron is required to create a copy of the

sample image using an simple graphic painting program called SMPaint. Only two types of operation can be used in SMPaint:

- Init: Make the new image with the specific size, all the pixels of the new image are white.
- Paint: User gives 5 integers **C**, **U**, **D**, **L**, **R** and SMPaint will change colour to **C** at all the pixels (**x**, **y**) such that (**U** ≤ **x** ≤ **D** and **L** ≤ **y** ≤ **R**).

The pixel (**x**, **y**) is the pixel at the **xth** row (from the top, 1-indexed) and the **yth** column (from the left side, 1-indexed).

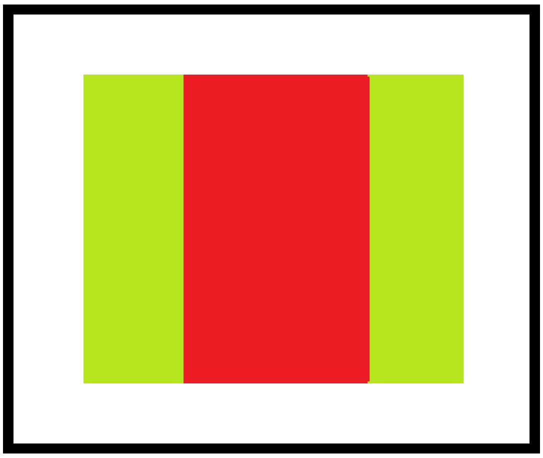

Figure 1

We can see that the Paint operation actually is painting a specific rectangle in the image by one specific colour.

The image in the **figure 1** can be drawn using 3 calls of the second function if we paint the red rectangle first and then paint two

green rectangles. Notice that if a pixel is changed colour several time, it final colour is corresponding to the last time it is painted.

This help us save some calls of the second function. For the image in figure 1 we can paint a large green rectangle first and then paint the red rectangle.

Your mission is help Ron finish the assignment with using as least as possible number of calls of the second function.

Input

The first line of the input contains integer **N**. Each of the next **N** lines contains **N** integers. The **yth** number in the **xth** line

represent the colour of the pixel (**x**, **y**) in the sample image.

Output

The first line of the output must contain integer **M** that is the number of calls of the second function you need.

The next **M** lines represent the calls to the second function in chronological order.

Each line must contain 5 integers which are the values (they must be in this order) **C**, **U**, **D**, **L**, **R** for the corresponding call. The following conditions must be held:

- **0 ≤ C ≤ 100**
- **1 ≤ U ≤ D ≤ N**
- **1 ≤ L ≤ R ≤ N**

Constraints

- **1 ≤ N ≤ 1000**
- The colours are represented by integers from **0** to **100** where **0** means white colour.

Example

Input:

```
5
0 0 0 0 0
0 1 2 1 0
0 1 2 1 0
0 1 2 1 0
0 0 0 0 0
```

Output:

```
2
```

```
1 2 4 2 4
2 2 4 3 3
```

Scoring & the test data generation

Your solution will not get point if it performs more than **N^2** Paint operations or the final image is different with the sample one. Your solution will be marked as Wrong Answer for that two cases.

If the number of Paint operations does not exceed **N^2** and the final image is the same as the sample one you will get the score which is equal to the number of Paint operations. Smaller score means your solution is better.

The test data is generated randomly by simulating the process of making an image in SMPaint using no more than **500** Paint operations. But please note that, the value of **N** is picked manually.

We have 25 official test files. You must correctly solve all test files to receive OK.
During the contest, your overall score is the sum of the scores on the first 7 test files.
After the contest, all solutions will be rescored by the sum of the scores on the rest 18 test files.
Note, that public part of the tests can not contain some border cases. For example, we should say that in all public tests **$10 \le N$** holds.