DEMO VERSION OF COMPETITION ASSIGNMENTS, IT

10^{th} and 11^{th} Grades

To be completed within 240 minutes

Maximum score is 100 points

Task A. Candy

There is candy lying in the shop window, each with numbers starting from one from the left to the right. Kids pass the shop window and ask their parents to buy candy from l_i to r_i. The shop's manager wants to compile a report that will contain all candy in the order that it was purchased. That is, the candy bought for the first kid, then the second kid, etc. For each kid, first a candy with the number l_i is bought, then l_i+1 and so on until r_i.

Input format

The first line of input data contains an integer number *n*, which is the number of types of candy ($1 \le n \le 1000$).

The next *n* lines contain types of candy consisting of upper and lower case letters of the Latin alphabet, numbers, and symbols «_» and «.». The names of candy types cannot exceed 100 characters.

The next line contains *m*, or the number of purchases ($1 \le m \le 1000$). The next *m* lines contain two integer numbers l_i and r_i. These are the numbers of the first and last candy bought to the *i*-th kid ($1 \le l_i \le r_i \le n$).

Output format

The list of all bought candy should be output.

Evaluation criteria

Solutions working appropriately only if $l_i = r_i$ will get at least 40 points.

Example

Standard input

```
3
Chocolate
Lollipop
Cake
2
2 3
1 2
```

Standard output

```
Lollipop
Cake
Chocolate
Lollipop
```

Note

The first purchase of candy contains numbers 2 and 3 (Lollipop, Cake). The second purchase contains numbers 1 and 2 (Chocolate, Lollipop).

Task B. Car dealership

There are *n* cars in the car dealership warehouse. The colour of each car is specified by a number.

There should be *k* cars in the show room. In order to attract buyers, it was decided to exhibit specific *k* cars so there would be a maximum number of different car colours.

Input format

The first line shall contain two integer numbers *n* and *k* ($1 \le k \le n \le 100000$), which is the number of cars stored in the warehouse and the number of cars to be exhibited in the show room.

The next line contains *n* numbers of a_i ($1 \le a_i \le 10^9$), which is the colour of the car number *i*.

Output format

Output the exact k space-separated integer numbers. These would be the colours of the cars to be displayed in the show room.

If there are several possible answers, output all of them.

Evaluation criteria

Solutions working appropriately only if $1 \le k \le n \le 2000$ will get at least 40 points.

Examples

Standard input

```
5 3
1 2 1 2 1
```

Standard output

```
1 2 1
```

Standard input

```
10 4
2 1 8 8 8 8 8 8 8 8
```

Standard output

```
1 2 8 8
```

Task C. Substitution cipher

The substitution cipher assigns to each letter of the Latin alphabet a symbol of the f(c) alphabet. This cipher could be applied to a line several times. Given the initial line and the encrypted line, determine how many times the substitution cipher has been applied.

Input format

The first line contains 26 symbols. The *k*-th symbol shows which letter corresponds to the *k*-th letter of the Latin alphabet.

The second line contains number n ($1 \le n \le 1000000$), which is the length of the initial and encrypted lines.

The next two lines have the length n. These lines consist of lowercase letters of the Latin alphabet.

Each letter of the Latin alphabet has their own number (a = 1 and z = 26).

Output format

Output the necessary number of symbol substitution operations in the output file's only line.

If the answer doesn't exist, output -1.

Evaluation criteria

Solutions working appropriately only if $n \le 1000$ will get at least 60 points.

Example

Standard input

```
bcdefghijklmnopqrstuvwwwww
7
abacaba
cdcecdc
```

Standard output

```
2
```

Note

Here is how the first line from the example is going to change:

- After the first substitution, the `abacaba` line is replaced by `bcbdbcb`; that is, *a* is replaced by `b`, `b` by `c`, and `c` by `d`;
- After the second substitution, the new `bcbdbcb` line will be replaced by `cdcecdc`; that is, `b` is replaced by `c`, `c` by `d`, and `d` by `e`;

- After two substitutions, we get line 2, so the answer is 2.

Task D. Volleyball team

N volleyball players are lined up in a row. Their height is a_1, a_2, ……, a_n. According to the rules of the volleyball championship, there can be as many players on the team as necessary, but the team's average height should be equal to *k*. The team's coach wants to select as many players in a row as possible so that their average height is equal to *k*. Help him do that.

Input format

The first line contains two integer numbers *n* and *k* ($1 \le n \le 100000$; $1 \le k \le 10^9$).
The second line contains *n* integer numbers a_i ($1 \le a_i \le 10^9$), which signifies the height of players.

Output format

Output numbers *l* and *m* which are the maximum number of players on the team and the number of the first player (the numbering starts with one).
If there are several answers possible, output any of them.

If it is impossible to assemble a team, output 0.

Evaluation criteria

Solutions working appropriately if $n \le 100$ will get at least 30 points.
Solutions working appropriately if $n \le 1000n$ will get at least 60 points.

Examples

Standard input

```
3 2
2 1 3
```

Standard output

```
3 1
```

Standard input

```
5 3
1 2 3 4 6
```

Standard output

```
3 2
```

Standard input

```
4 3
1 2 5 6
```

Standard output

```
0
```

Task E. Colonisation of Mars

The Mars map is an $n \times m$ rectangle. Each cell is characterised by a number signifying the type of soil in this cell.

You can build a residential module in each cell, but two requirements must be met:

- you can get from one module another moving only along the modules adjacent to the side;
- all modules are located on not more than two types of soil.

Determine the maximum number of residential modules that could be built on Mars.

Input format

The first line of the input file contains two integer numbers n and m ($1 \le n, m \le 1000$). These are the dimensions of Mars. Each of the next n lines contains m numbers, which is the type of soil in each cell. Types of soil are characterized by natural numbers not exceeding 10^6.

Output format

In the first line, output one natural number which is the maximum number of residential modules that could be built on Mars. The second line should contain two numbers, which are the types of soil. In case a module is built only on one type of soil, its number should be output twice.

If there are several right answers, output any of them.

Evaluation criteria

Solutions working appropriately if *n* and *m* do not exceed 20 will get at least 30 points.
Solutions working appropriately if *n* and *m* do not exceed 80 will get at least 60 points.

Example

Standard input

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

Standard output

```
17
1 2
```