



1004. Multi-key Sorting

Total: 128 Accepted: 42

Description

Time Limit: 10sec Memory Limit: 32MB

Consider a table with rows and columns. The columns are numbered from 1 to C . For simplicity's sake, the items in the table are strings consisting of lower case letters.

1	2	3	XX	1	2	3	XX	1	2	3
apple	red	sweet		banana	brown	rotten		apple	green	sour
apple	green	sour		apple	green	sour		apple	red	sweet
pear	green	sweet		pear	green	sweet		banana	brown	rotten
banana	yellow	sweet		apple	red	sweet		banana	yellow	sweet
banana	brown	rotten		banana	yellow	sweet		pear	green	sweet

Table 1 Table 2 Table 3

You are given the operation $\text{Sort}(k)$ on such tables: $\text{Sort}(k)$ sorts the rows of a table in the order of the values in column k (while the order of the columns does not change). The sort is stable, that is, rows that have equal values in column k , remain in their original order. For example, applying $\text{Sort}(2)$ to Table 1 yields Table 2.

We are interested in sequences of such sort operations. These operations are successively applied to the same table. For example, applying the sequence $\text{Sort}(2); \text{Sort}(1)$ to Table 1 yields Table 3.

Two sequences of sort operations are called equivalent if, for any table, they have the same effect. For example, $\text{Sort}(2); \text{Sort}(2); \text{Sort}(1)$ is equivalent to $\text{Sort}(2); \text{Sort}(1)$. However, it is not equivalent to $\text{Sort}(1); \text{Sort}(2)$, because the effect on Table 1 is different.

Task

Given a sequence of sort operations, determine a shortest equivalent sequence.

Input

注意：输入包含多个测试数据。

The first line of the input contains two integers, C and N . C ($1 \leq C \leq$

$1\ 000\ 000$) is the number of columns and N ($1 \leq N \leq 3\ 000\ 000$) is the number of sort operations. The second line contains N integers, k_i ($1 \leq k_i \leq C$). It defines the sequence of sort operations $\text{Sort}(k_1); \dots; \text{Sort}(k_N)$.

Output

The first line of the output contains one integer, M , the length of the shortest sequence of sort operations equivalent to the input sequence (Subtask A). The second line contains exactly M integers, representing a shortest sequence (Subtask B). You can omit the second line if you solve only Subtask A.

Sample Input

[Copy](#)

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

Sample Output

[Copy](#)

```
3
1 2 3
```

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