D. Secret Santa

time limit per test: 2 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

Every December, VK traditionally holds an event for its employees named "Secret Santa". Here's how it happens.

n employees numbered from 1 to n take part in the event. Each employee i is assigned a different employee b_i, to which employee i has to make a new year gift. Each employee is assigned to exactly one other employee, and nobody is assigned to themselves (but two employees may be assigned to each other). Formally, all b_i must be distinct integers between 1 and n, and for any i, $b_i \neq i$ must hold.

The assignment is usually generated randomly. This year, as an experiment, all event participants have been asked who they wish to make a gift to. Each employee i has said that they wish to make a gift to employee a_i.

Find a valid assignment b that maximizes the number of fulfilled wishes of the employees.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^5$). Description of the test cases follows.

Each test case consists of two lines. The first line contains a single integer n ($2 \le n \le 2 \cdot 10^5$) — the number of participants of the event.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$; $a_i \neq i$) — wishes of the employees in order from 1 to n.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, print two lines.

In the first line, print a single integer k ($0 \le k \le n$) — the number of fulfilled wishes in your assignment.

In the second line, print n distinct integers $b_1, b_2, \ldots, b_n$ ($1 \le b_i \le n$; $b_i \neq i$) — the numbers of employees assigned to employees $1, 2, \ldots, n$.

k must be equal to the number of values of i such that $a_i = b_i$, and must be as large as possible. If there are multiple answers, print any.

Example

input
2 3 2 1 2 7 6 4 6 2 4 5 6
output
2 3 1 2 4 6 4 7 2 3 5 1

Note

In the first test case, two valid assignments exist: $[3, 1, 2]$ and $[2, 3, 1]$. The former assignment fulfills two wishes, while the latter assignment fulfills only one. Therefore, $k = 2$, and the only correct answer is $[3, 1, 2]$.

Codeforces Round #733 (Div. 1 + Div. 2, based on VK Cup 2021 - Elimination (Engine))

Finished

→ Practice?

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

→ Problem tags

constructive algorithms | flows | graphs | greedy | math | *1600

No tag edit access

→ Contest materials

- Announcement
- Tutorial (en)