Card Game

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Alice and Bob are playing a card game. They have collected $2n$ cards, each of which is written with an integer. Also, each integer between 1 and n appears on **exactly two cards**. Initially, Alice and Bob each hold n cards.

The game will proceed in turns, with Alice going first. On each turn, the current player must choose a card from their hand and place it on top of the pile. If there are now two cards with the same number in the pile, the current player scores 1 point and removes the two matching cards along with all the cards in between, placing them in the discard pile.

Alice is a novice at this game, and Bob wants to tease her. Bob wants to know: for a given sequence of moves by Alice, how can he arrange his moves to minimize Alice's score?

Input

The input consists of multiple test cases. The first line contains an integer T ($1 \le T \le 10^5$), representing the number of test cases.

For each test case:

The first line contains an integer n ($1 \le n \le 5 \times 10^5$), representing the number of different card types.

The next line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$), representing Alice's sequence of moves. It is guaranteed that no number appears more than twice in the sequence a_i.

It is guaranteed that the total sum of n across all test cases does not exceed 5×10^5.

Output

For each test case:

Output an integer on the first line, representing Alice's minimum score.

On the second line, output n integers $b_1, b_2, \ldots, b_n$ ($1 \le b_i \le n$), representing one of Bob's sequences of moves. It must be ensured that each number from 1 to n appears exactly twice in the combined sequences of a_i and b_i. If there are multiple sequences that minimize Alice's score, any one of them may be output.

Example

standard input	standard output
3 3 1 2 3 5 3 1 4 1 5 5 1 4 5 1 4	0 1 2 3 0 2 3 2 4 5 1 3 2 2 3 5

Note

For the third test case, the events corresponding to each round of operations and the state of the pile after each operation are as follows:

#	Operation	Pile	Alice's Score
1	Alice plays a 1, no two cards with the same number in the pile	[1]	0
2	Bob plays a 3, no two cards with the same number in the pile	[1, 3]	0
3	Alice plays a 4, no two cards with the same number in the pile	[1, 3, 4]	0
4	Bob plays a 2, no two cards with the same number in the pile	[1, 3, 4, 2]	0
5	Alice plays a 5, no two cards with the same number in the pile	[1, 3, 4, 2, 5]	0
6	Bob plays a 2, two 2s in the pile, Bob scores 1 point	[1, 3, 4]	0
7	Alice plays a 1, two 1s in the pile, Alice scores 1 point	[]	1
8	Bob plays a 3, no two cards with the same number in the pile	[3]	1
9	Alice plays a 4, no two cards with the same number in the pile	[3, 4]	1
10	Bob plays a 5, no two cards with the same number in the pile	[3, 4, 5]	1