D. 1709

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You are given two arrays of integers $a_1, a_2, \ldots, a_n$ and $b_1, b_2, \ldots, b_n$. It is guaranteed that each integer from 1 to $2 \cdot n$ appears in exactly one of the arrays.

You need to perform a certain number of operations (possibly zero) so that **both** of the following conditions are satisfied:

- For each $1 \leq i < n$, it holds that $a_i < a_{i+1}$ and $b_i < b_{i+1}$.
- For each $1 \leq i \leq n$, it holds that $a_i < b_i$.

During each operation, you can perform exactly one of the following three actions:

1. Choose an index $1 \leq i < n$ and swap the values a_i and a_{i+1}.
2. Choose an index $1 \leq i < n$ and swap the values b_i and b_{i+1}.
3. Choose an index $1 \leq i \leq n$ and swap the values a_i and b_i.

You do not need to minimize the number of operations, but the total number must not exceed 1709. Find any sequence of operations that satisfies **both** conditions.

Input

Each test consists of multiple test cases. The first line contains a single integer t ($1 \leq t \leq 100$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \leq n \leq 40$) — the length of the arrays a and b.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq 2 \cdot n$).

The third line of each test case contains n integers $b_1, b_2, \ldots, b_n$ ($1 \leq b_i \leq 2 \cdot n$).

It is guaranteed that each integer from 1 to $2 \cdot n$ appears either in array a or in array b.

Output

For each test case, output the sequence of operations.

In the first line for each test case, output the number of operations k. Note that $0 \leq k \leq 1709$.

In the following k lines for each test case, output the operations themselves:

- If you want to swap the values a_i and a_{i+1}, output two integers 1 and i. Note that $1 \leq i < n$.
- If you want to swap the values b_i and b_{i+1}, output two integers 2 and i. Note that $1 \leq i < n$.
- If you want to swap the values a_i and b_i, output two integers 3 and i. Note that $1 \leq i \leq n$.

It can be shown that under the given constraints, a solution always exists.

Example

input Copy

```
6
1
1
2
1
2
```

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

output Copy

```
0
1
3 1
1
2 1
1
3 2
9
3 1
3 2
3 3
1 1
2 1
2 2
1 2
1 1
2 1
6
2 2
1 1
1 2
2 1
3 1
3 2
```

Note

In the first test case, $a_1 < b_1$, so no operations need to be applied.

In the second test case, $a_1 > b_1$. After applying the operation, these values will be swapped.

In the third test case, after applying the operation, $a = [1, 3]$ and $b = [2, 4]$.

In the fourth test case, after applying the operation, $a = [1, 2]$ and $b = [3, 4]$.