Now-or-Never

After you were back to problem-solving with an endless spirit, you received an invitation to the biggest programming contest in the galaxy! The galaxy you live in is a little weird: the planets are arranged on the x axis, and there is exactly 1 planet in each integer point along the axis. The contest consists of n problems, and in order to solve the i th problem, you need to be on the planet with coordinate $x[i]$ exactly at the $t[i]$ th second after the contest starts. You can assume it takes no additional time to solve a problem once you are in the correct position at the correct moment.

Since it is not an individual contest, you need to form a team. Each contestant can start from any planet initially and can move from one planet to its adjacent planet in 1 second. We consider two planets adjacent if the distance between the two planets is 1.

Unfortunately, you are bad at making friends, so you want to calculate the **minimum number of members you need in your team to solve all the problems in the contest.** Additionally in some subtasks, for each contestant in the team, you need to find the indices of the problems in the order they will solve. For that, you will be given an integer k $(1 \leq k \leq 2)$, which holds the following meaning:

- $k = 1$: You only need to output the minimum number of members to form your team to get a full score.
- $k = 2$: If you can only output the minimum number of contestants correctly, you will get 30% of the points. For 100% of the points, you also need to output the indices of the problems solved by each contestant **in the order they solve them**.

Input

Each test contains multiple test cases. The input starts in the following format:

- line 1: T k

Here, T is the number of test cases and the meaning of k is explained above. For each of the T test cases, input is given in the following format:

- line 1: n
- line 2: $t[1]$ $t[2]$ $\ldots$ $t[n]$
- line 3: $x[1]$ $x[2]$ $\ldots$ $x[n]$

Output

For each testcase, write the output to the standard output in the following format:

If you only want to output the minimum number of contestants correctly,

- line 1: q 0

If you want to output both the minimum number of contestants and the indices of the problems solved by each contestant,

- line 1: q 1
- line $1+i$ $(1 \le i \le q)$: $m[i]$ $b[i][1]$ $b[i][2]$ $\dots$ $b[i][m[i]]$

Here, q is the minimum number of contestants you need to form your team. $m[i]$ denotes the number of problems i-th contestant will solve. $b[i]$ is the list of the indices of the problems in the order i-th contestant solved. Each problem should be solved by **exactly** one time. That is, for all $1 \le i \le n$, i should be belong to exactly one of the lists exactly once. If there are multiple ways to solve all problems, output any of them.

Constraints

Let N be the sum of n over all test cases.

- $1 \le T \le 1000$
- $1 \le n, N \le 10^6$
- $0 \le x[i], t[i] \le 10^9$ (for all $1 \le i \le n$)

Subtasks

1. (9 points) $k = 1$, and the minimum number of members needed is at most 2.
2. (12 points) $k = 1$, $N \le 17$.
3. (21 points) $k = 1$, $x[i] \le x[i+1]$, $t[i] \le t[i+1]$ (for all $1 \le i \le n-1$)
4. (22 points) $k = 2$, $N \le 2000$
5. (36 points) $k = 2$

Example 1

```
1 2
5
1 2 3 8 7
2 3 2 10 5
```

One correct output is:

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

In this case, making a team of 2 members is enough. Let T be the time spent after the contest started. The movement of the 1st Member is explained below:

1. Start at coordinate 2 at $T = 0$, wait there until $T = 1$ and solve problem 1.
2. Move to coordinate 3 at $T = 2$ and solve problem 2.
3. Return to coordinate 2 at $T = 3$ and solve problem 3.
4. Head for the planet with coordinate 5, reach it at $T = 6$, wait for a second, and solve problem 5.

The 2nd Member can start at the planet with coordinate 10 and solve problem 4 at $T = 8$. It can be shown that all problems cannot be solved with a team of size less than two.

The following output will fetch 30% points only.

```
2 0
```

Example 2

```
1 1
5
1 2 3 8 7
2 3 2 10 5
```

The correct output is:

```
2 0
```

In this example, since $k = 1$, you only need to output the minimum number of contestants to get a full score. However, you will still get full score if you print the indices of the problems solved by each contestant. So, the following output is also correct.

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

Example 3

```
2 2
4
12 2 1 1000
20 34 10 15
4
1 2 3 4
1 2 3 4
```

One correct output is:

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