2184 - Atlantis

Europe - Mid Central - 2000/2001

There are several ancient Greek texts that contain descriptions of the fabled island Atlantis. Some of these texts even include maps of parts of the island. But unfortunately, these maps describe different regions of Atlantis. Your friend Bill has to know the total area for which maps exist. You (unwisely) volunteered to write a program that calculates this quantity.

Input

The input file consists of several test cases. Each test case starts with a line containing a single integer n ($1 \le n \le 100$) of available maps. The n following lines describe one map each. Each of these lines contains four numbers x1 ; y1 ; x2 ; y2 ($0 \le x1 < x2 \le 100000$; $0 \le y1 < y2 \le 100000$), not necessarily integers. The values (x1 ; y1) and (x2 ; y2) are the coordinates of the top-left resp. bottom-right corner of the mapped area. The input file is terminated by a line containing a single 0. Don t process it.

Output

For each test case, your program should output one section. The first line of each section must be "Test case #k", where k is the number of the test case (starting with 1). The second one must be "Total explored area: a", where a is the total explored area (i.e. the area of the union of all rectangles in this test case), printed exact to two digits to the right of the decimal point. Output a blank line after each test case.

Sample Input

```
2
10 10 20 20
15 15 25 25.5
0
```

Sample Output

```
Test case #1
Total explored area: 180.00
```

Mid Central 2000-2001

Fedor and coupons

All our characters have hobbies. The same is true for Fedor. He enjoys shopping in the neighboring supermarket.

The goods in the supermarket have unique integer ids. Also, for every integer there is a product with id equal to this integer. Fedor has n discount coupons, the i-th of them can be used with products with ids ranging from l_i to r_i, inclusive. Today Fedor wants to take exactly k coupons with him.

Fedor wants to choose the k coupons in such a way that the number of such products x that all coupons can be used with this product x is as large as possible (for better understanding, see examples). Fedor wants to save his time as well, so he asks you to choose coupons for him. Help Fedor!

Input

The first line contains two integers n and k ($1 \le k \le n \le 3 \cdot 10^5$) — the number of coupons Fedor has, and the number of coupons he wants to choose.

Each of the next n lines contains two integers l_i and r_i ($-10^9 \le l_i \le r_i \le 10^9$) — the description of the i-th coupon. The coupons can be equal.

Output

In the first line print single integer — the maximum number of products with which all the chosen coupons can be used. The products with which at least one coupon cannot be used shouldn't be counted.

In the second line print k distinct integers $p_1, p_2, \ldots, p_k$ ($1 \le p_i \le n$) — the ids of the coupons which Fedor should choose.

If there are multiple answers, print any of them.

Examples

input

```
4 2
1 100
40 70
120 130
125 180
```

output

```
31
1 2
```

input

```
3 2
1 12
15 20
25 30
```

output

```
0
1 2
```

input

```
5 2
1 10
5 15
14 50
30 70
99 100
```

output

```
21
3 4
```

A large part of the world economy depends on oil, which is why research into new methods for finding and extracting oil is still active. Profits of oil companie in part on how efficiently they can drill for oil. The International Crude Petroleum Consortium (ICPC) hopes that extensive computer simulations will make it determine how to drill oil wells in the best possible way.

Drilling oil wells optimally is getting harder each day – the newly discovered oil deposits often do not form a single body, but are split into many parts. Th currently concerned with stratified deposits, as illustrated in Figure 1.

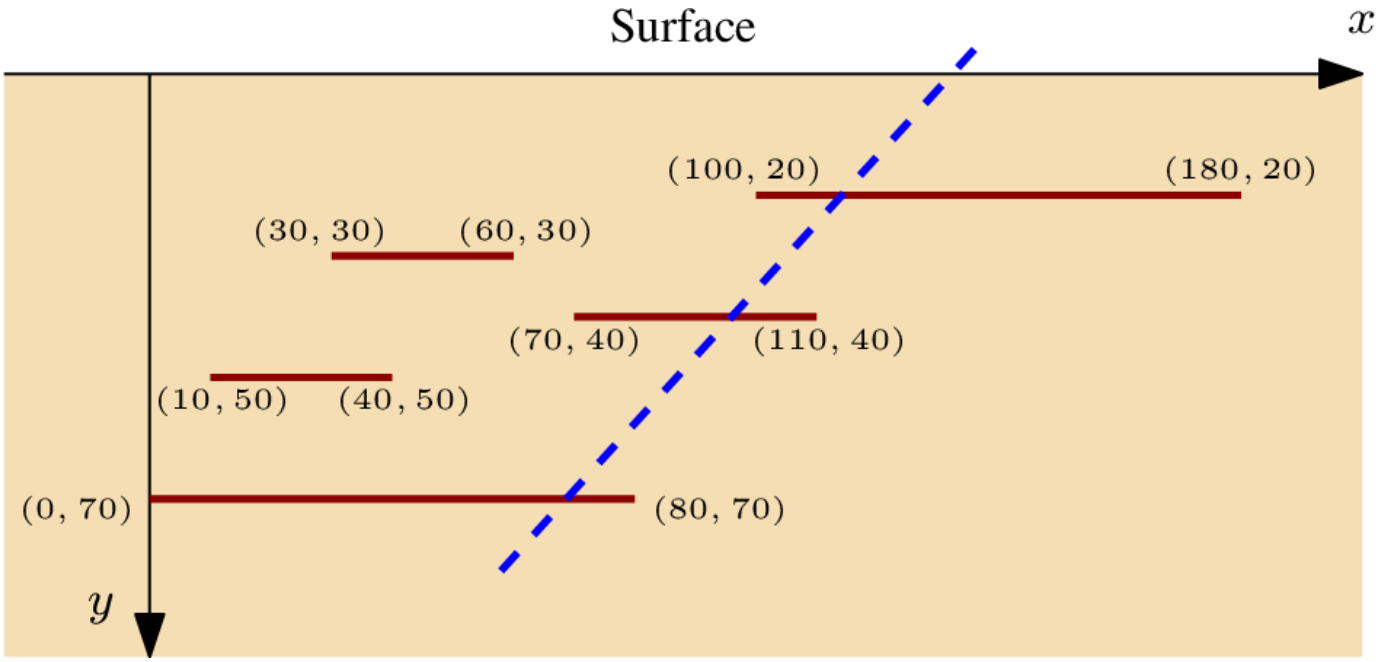

Figure 1: Oil layers buried in the earth. This figure corresponds to Sample Input 1.

To simplify its analysis, the ICPC considers only the 2-dimensional case, where oil deposits are modeled as horizontal line segments parallel to the earth's The ICPC wants to know how to place a single oil well to extract the maximum amount of oil. The oil well is drilled from the surface along a straight line extract oil from all deposits that it intersects on its way down, even if the intersection is at an endpoint of a deposit. One such well is shown as a dashe Figure 1, hitting three deposits. In this simple model the amount of oil contained in a deposit is equal to the width of the deposit. Can you help the ICPC deter maximum amount of oil that can be extracted by a single well?

Input

The first line of input contains a single integer n ($1 \leq n \leq 2\,000$), which is the number of oil deposits. This is followed by n lines, each describing a single These lines contain three integers x_0, x_1, and y giving the deposit's position as the line segment with endpoints (x_0, y) and (x_1, y). These number $|x_0|, |x_1| \leq 10^6$ and $1 \leq y \leq 10^6$. No two deposits will intersect, not even at a point.

Output

Display the maximum amount of oil that can be extracted by a single oil well.

Sample Input 1

```
5
100 180 20
30 60 30
70 110 40
10 40 50
0 80 70
```

Sample Output 1

```
200
```

Sample Input 2

```
3
50 60 10
-42 -42 20
25 0 10
```

Sample Output 2

```
25
```