

Problem G. Gold Mines

Input file: gold.in
Output file: gold.out
Time limit: 10 seconds
Memory limit: 256 megabytes

There are n gold mines in Flatland, the i -th gold mine is located at a point with coordinates (x_i, y_i) . There are three companies *Zero*, *One* and *Two* working on the mines, for each mine the value of its owner $c_i \in \{0, 1, 2\}$ is known.

Recently the parliament of Flatland has adopted the new law which allows the company to work on a gold mine only if the mine is located inside its territory. The territory of each company must be a non-degenerate rectangle with sides parallel to coordinate axes. Territories of different companies must not have a common part of non-zero area (although they may have common borders).

However, it turned out that all three companies belong to the same holding *Three*, so the managers of the companies have decided to choose territory for each company to maximize the total number of mines that the companies would be able to work at. If the mine is on the border of two or three territories, any of their owners can work on this mine. Help the managers of the companies to set up the territories.

Input

The input file contains multiple test cases. The first line of each test case contains n ($1 \leq n \leq 50\,000$). The following n lines contain three integers each: x_i, y_i and c_i ($-10^9 \leq x_i, y_i \leq 10^9, c_i \in \{0, 1, 2\}$).

The last test case is followed by $n = 0$, it must not be processed. The sum of n for all test cases in one input file doesn't exceed 50 000.

Output

Output four lines for each test case. The first of these lines must contain k — the maximal possible number of mines that can be worked on after territories of the companies are set up. The following three lines must describe territories of the companies. Each territory must be described by four integers: x_1, y_1, x_2 and y_2 ($-2 \cdot 10^9 \leq x_1 < x_2 \leq 2 \cdot 10^9, -2 \cdot 10^9 \leq y_1 < y_2 \leq 2 \cdot 10^9$) — the coordinates of two opposite corners of the rectangle. A mine inside the first rectangle can be worked if $c_i = 0$, a mine inside the second rectangle can be worked if $c_i = 1$, a mine inside the third rectangle can be worked if $c_i = 2$.

Examples

gold.in	gold.out
12	10
0 0 0	-1 -1 2 0
1 0 0	-1 0 2 3
2 0 1	2 -1 4 3
3 0 2	
0 1 1	
1 1 1	
2 1 2	
3 1 1	
0 2 1	
1 2 0	
2 2 2	
3 2 2	
0	