A – Three Castles

Memory limit: 1024 MB
Time limit: 4 s

In the distant kingdom of ICPC, there are n towers. For each tower we know its position (x, y) on the kingdom's map. For simplicity, we treat each tower as a point on the map. It is guaranteed that there are no two towers in the same position, and no three towers lie on the same line.

King EUC has decided that it is time to build three castles, according to the following rules:

- Each castle contains a non-empty set of towers.
- No tower should be left alone, not belonging to any castle.
- Every castle should form a convex polygon on the kingdom's map with all its towers located in the vertices of this polygon. We assume that castles with one or two towers are also valid.
- No pair of castles should have a point in common, be it at the border or in the interior.

King EUC has not yet decided the number of towers for each of its three castles. Therefore, he asks you to determine for every triplet of positive integers s_1, s_2, s_3 (such that $s_1 + s_2 + s_3 = n$), if there is a solution where the number of towers in the i-th castle is s_i ($1 \le i \le 3$), and if such a solution exists, to show an example of a partition of towers among three castles.

Input

The first line of the input contains one integer n ($3 \le n \le 40$), denoting the number of towers. Towers are numbered from 1 to n.

Each of the next n lines contains the coordinates of one tower, two integers x and y ($-10^6 \le x, y \le 10^6$). As it was already mentioned, there are no two towers in the same position, and no three towers lie on the same line.

Output

The first line of the output should hold the number k, being the number of different triplets for which a solution exists.

Each of the next k lines should contain a solution to one of the triplets. Each line should consist of $3 + n$ integers separated by single spaces: s_1, s_2, s_3, $a_{1,1}, \ldots, a_{1,s_1}$, $a_{2,1}, \ldots, a_{2,s_2}$, $a_{3,1}, \ldots, a_{3,s_3}$, where $a_{i,j}$ denotes the number of the j-th tower in the i-th castle.

Each unordered triplet with a solution should appear exactly once, and the order of the towers within each castle can be arbitrary.

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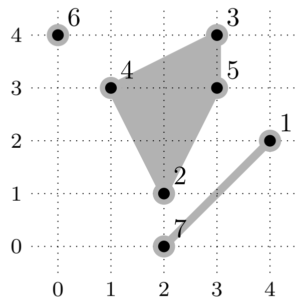
Example

For the input data:

```
7
4 2
2 1
3 4
1 3
3 3
0 4
2 0
```

one possible correct result is:

```
3
1 3 3 7 6 3 4 2 5 1
4 2 1 3 4 5 2 7 1 6
2 2 3 4 5 2 7 1 6 3
```



Explanation: There are four possible triplets that sum to 7. For triplet $1, 2, 4$ one solution is to take castles $\{6\}$, $\{1, 7\}$, and $\{2, 3, 4, 5\}$. Triplets $1, 3, 3$ and $2, 2, 3$ also have solutions. There is no solution for triplet $1, 1, 5$.

Note that $\{4\}$, $\{2, 5\}$, and $\{1, 3, 6, 7\}$ is not a valid solution for triplet $1, 2, 4$, since the third castle intersects with the first and the second. Note that $\{2\}$, $\{7\}$, and $\{1, 3, 4, 5, 6\}$ is not a valid solution for triplet $1, 1, 5$, since the third castle is not convex.