

Problem K. Sewing Graph

Input file: standard input
Output file: standard output
Time limit: 2 seconds
Memory limit: 1024 megabytes

Donghyun recently bought a square-shaped tablecloth. There are N dots on the cloth, and the dots can be seen from both sides of the cloth. Donghyun thought that the tablecloth can be made more beautiful, so he decided to decorate the cloth with sewing.

For convenience, let's assume that each dot is a point on the xy -plane and the dots are numbered from 1 to N . Dot i ($1 \leq i \leq N$) is placed at coordinate (x_i, y_i) . No two dots have the same coordinates. A **sewing sequence** is an integer sequence $\{s_i\}$ of length $k \geq 2$ satisfying $1 \leq s_i \leq N$ ($1 \leq i \leq k$) and $s_i \neq s_{i+1}$ ($1 \leq i \leq k-1$). The sequence draws edges on the cloth per the following rules:

- Draw an edge connecting dot s_{2i-1} and dot s_{2i} on the front side of the cloth for all $1 \leq i \leq \lfloor \frac{k}{2} \rfloor$.
- Draw an edge connecting dot s_{2j} and dot s_{2j+1} on the back side of the cloth for all $1 \leq j \leq \lfloor \frac{k-1}{2} \rfloor$.

Donghyun wants to make a **beautiful pattern** on the tablecloth, which is defined as the following:

- For both sides of the cloth, all N dots are connected by the edges on that side.
- Two edges on the same side of the cloth can intersect only at a common endpoint.

Donghyun is very busy, so he wants to finish his sewing job as quickly as possible. In other words, over all sewing sequences that produces a beautiful pattern, Donghyun decides to choose the shortest such sequence. Your job is to find such a sequence.

Note that Donghyun wants to minimize the length of the sewing sequence itself, not the sum of the lengths of the edges he draws.

Input

On the first line, a single integer N is given. ($2 \leq N \leq 1000$)

For each of the next N lines, two integers x_i and y_i are given, which means dot i is placed at coordinate (x_i, y_i) . ($1 \leq x_i, y_i \leq 10^9$)

No two dots are at the same coordinates.

Output

On the first line, output a positive integer k , the length of the shortest sewing sequence that produces a beautiful pattern.

On the next line, output s_1, s_2, \dots, s_k , the actual sewing sequence.

It can be proven that, for every possible input, there exists a sewing sequence that produces a beautiful pattern.

Example

standard input	standard output
5	9
1 1	1 2 1 4 1 3 5 3 1
2 4	
3 2	
4 5	
5 3	

Note

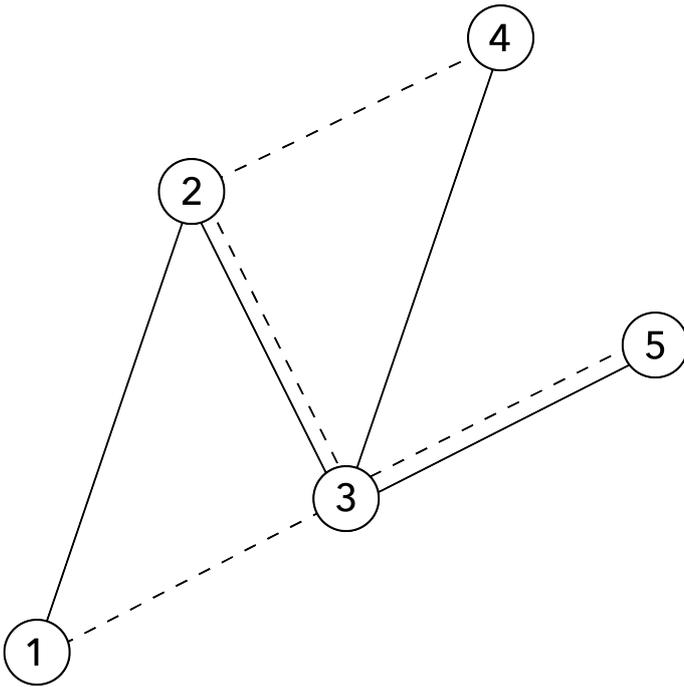


Figure 1. Visualization of sample output. Solid lines represent for edges on front side, dashed lines represent for back side.