Demarcation

For a long time the island of Bytopia was ruled by the fair king Byteasar. But after the sudden death of the king, his two sons – twins Biteon and Byteon – could not come to an agreement which one of them should ascend the throne. Therefore they decided to divide the island into two provinces to rule them independently.

On a map Byteotia is shaped as a polygon of `N` vertices. Every side of the polygon is parallel to a side of the map, and every two consecutive sides are perpendicular to each other. Biteon and Byteon want to divide the polygon into two congruent figures, using one line segment contained in the polygon and parallel to a side of the map. (Two figures are congruent if one can be transformed into the other using a combination of reflections, rotations and translations.) Coordinates of the polygon vertices and the end points of the dividing segment are integers.

The king's sons asked you to verify whether such a division is possible.

Task

Given the shape of the island, determine if it can be partitioned by a horizontal or vertical segment into two congruent pieces. If it can, find one such segment.

Implementation

You need to implement the procedure `divide_island(N, X, Y)` which takes the following parameters:

- `N` — the number of vertices in the polygonal outline of the island
- `X` — a one–dimensional array that contains the x–coordinates of the vertices
- `Y` — a one–dimensional array that contains the y–coordinates of the vertices

More specifically, $(\texttt{X}[i], \texttt{Y}[i])$, $0 \leq i \leq \texttt{N} - 1$, are coordinates of the i–th vertex of the polygon.

Procedure `divide_island` has to communicate the answer by calling one of the two provided procedures:

- `division_line(x1, y1, x2, y2)` — call this procedure if it is possible to divide the island into congruent parts with a horizontal or vertical segment. Its parameters must describe such segment: (`x1`, `y1`) and (`x2`, `y2`) must be the coordinates of its endpoints. Either `x1` = `x2` or `y1` = `y2` must hold
- `impossible` — call this procedure with no parameters if a suitable division cannot be found

Examples

For the example

$$\texttt{N = 10} \quad \texttt{X} = \begin{matrix}0\\1\\1\\3\\3\\2\\2\\1\\1\\0\end{matrix} \quad \texttt{Y} = \begin{matrix}0\\0\\1\\1\\5\\5\\3\\3\\2\\2\end{matrix}$$

`division_line(1, 2, 3, 2)` should be called (this is not the only correct choices of parameters).

On the other hand, for the example

$$\texttt{N = 6} \quad \texttt{X} = \begin{matrix}0\\1\\1\\2\\2\\0\end{matrix} \quad \texttt{Y} = \begin{matrix}0\\0\\1\\1\\2\\2\end{matrix}$$

the only correct solution is to call `impossible`.

Need illustrations for examples

Scoring

Subtask 1 (40 points). $4 \leq \texttt{N} \leq 200$

Subtask 2 (10 points). $4 \leq \texttt{N} \leq 5000$

Subtask 3 (50 points). $4 \leq \texttt{N} \leq 100\,000$

Constraints

Time limit: ? s.

Memory limit: 128 MB.