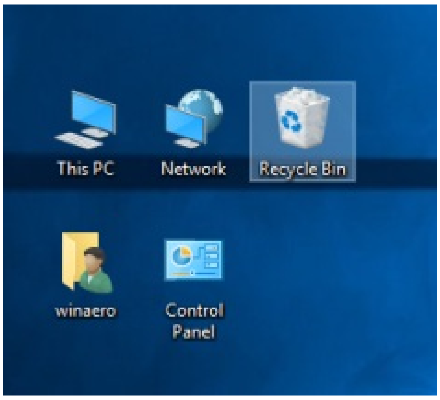
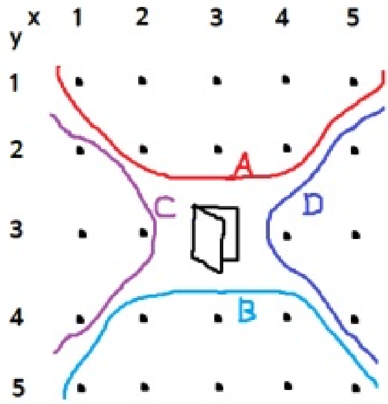
4-3. Windows Icon Manager

There are N icons on the Desktop of the Windows Operating System. Since Windows puts icons on a grid by default, we can assume that the x and y coordinates of each icon is a positive integer. The upper-left corner has coordinate $(1, 1)$. There cannot be two or more icons having the same coordinate.

<table>
<tr><th>an example screenshot of Windows Desktop</th><th>Selected icon at $(3, 3)$</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

Let's say that we selected an icon at (x_0, y_0) by, for example, clicking it. In this problem, we assume that no more than one icon can be selected simultaneously.

Now, suppose that a certain direction key d is pushed, where d is one of 'Up', 'Down', 'Left', and 'Right'. The selected icon can be changed according to the rules below.

Key	Area	Priority 1	Priority 2
Up	A	smallest y	largest x
Down	B	largest y	largest x
Left	C	smallest x	largest y
Right	D	largest x	largest y

- Define S as the set of all icons inside the 'Area' of d.
- If S is empty, the selected icon doesn't change.
- Otherwise,
  - Let S_0 be the set of all icon(s) in S that has minimum Euclidean distance from the current selected icon at (x_0, y_0). The Euclidean distance between an

icon at (x_1, y_1) and another icon at (x_2, y_2) is $\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$.

  - Let S_1 be the set of all icon(s) in S_0 having 'Priority 1' of d.
  - Let S_2 be the set of all icon(s) in S_1 having 'Priority 2' of d. It can be proven that $|S_2| = 1$.
  - The selected icon is changed to the only element in S_2.

For clarity, this is the formal definition of each of the areas. You can refer to the figure above to intuitively understand the meaning of the areas.

- $A = \{(x,y) \in \mathbb{N}^2 : x+y \le x_0+y_0,\ x-y \ge x_0-y_0,\ (x,y) \ne (x_0,y_0)\}$
- $B = \{(x,y) \in \mathbb{N}^2 : x+y \ge x_0+y_0,\ x-y \le x_0-y_0,\ (x,y) \ne (x_0,y_0)\}$
- $C = \{(x,y) \in \mathbb{N}^2 : x+y < x_0+y_0,\ x-y < x_0-y_0,\ (x,y) \ne (x_0,y_0)\}$
- $D = \{(x,y) \in \mathbb{N}^2 : x+y > x_0+y_0,\ x-y > x_0-y_0,\ (x,y) \ne (x_0,y_0)\}$
- Note that $\mathbb{N}$ is the set of positive integers.

You have to place N icons on the Desktop just in case your mouse doesn't work. The x-coordinate and y-coordinate of each icon should be a positive integer between 1 and $1\,000$ (inclusive). For any two icons A and B, it should be possible to move the selected icon from icon A to icon B using at most K direction key presses.

This is an output-only task with partial scoring. There is no input file. You should only submit an output file `windows.txt`.

Output format

The output file `windows.txt` must be in the following format:

- line 1: N
- line $2+i$ ($0 \le i \le N-1$): $X[i]\ Y[i]$

For each $0 \le i \le N-1$, icon i will be placed on coordinate $(X[i], Y[i])$. Note that the output should satisfy all the conditions above.

Constraints

- $N = 1\,000$

Subtasks

1. (100 points) No additional constraints.
   - If the output file has the wrong format, you get 0 points.
   - Otherwise, let K be the smallest non-negative integer where we can move from any icon p to any other icon q within K keypresses. It can be proven that such K exists.

- If $K > 14$, you get $\lfloor 100 \times 0.94^{K-14} \rfloor$ points. Note that when $K = 60$, you get 5 points.
- If $K \leq 14$, you get 100 points.