2020 … AND THE RAIDERS OF THE REMOTE R—

In *"The Masked Lady … and the Raiders of the Remote R—"* our heroine stumbled upon some remote ramshackled ruins and interrupted manifold malevolent mausoleum marauders, intent on stealing the famed idols of R—. Each idol sat upon a pedestal and ancient mechanisms had so far prevented the marauders making off with their prizes!

The mechanisms were so finely balanced that it was only possible, at any time, to swap over the idols on two pedestals. Furthermore, dastardly death-traps were set to decapitate, desiccate and dismantle anyone foolish enough to swap idols between the same pair of pedestals more than once.

At our heroine's arrival the marauders scattered and it only remained to move the idols back to their correct pedestals. Unfortunately our heroine had not seen the sequence of swaps. Fortunately, hidden in the shadows, were two additional idol topped pedestals which the dust of ages indicated had not been disturbed!

For example, suppose that the original order of the idols was 0, 1, …, *n+1*, where idols 0 and *n+1* were the hidden guaranteed undisturbed idols, and that the idols were discovered in the order 042135:

- The swaps are unknown. The sequence might have been 012345→021345→041325→042315→042135 but it could have been 012345→042315→042135.
- Using the undisturbed idols the original order can be restored as 042135→142035→152034→152043→152340→512340→012345.

SAMPLE INPUT

```
4
4
2
1
3
```

The first line of input will consist of a single integer, n ($1 \le n \le 2^{20}$), indicating the number of idols that might have been moved. The next n lines will contain a permutation of the integers 1, …, n giving the order in which the idols (excluding 0 and *n+1* in the shadows) were discovered.

You should output a sequence of lines, each giving a pair of idols to be swapped, followed by the line `-1 -1`. Each swap *must* include at least one idol on the 0^{th} or $(n+1)^{st}$ pedestal. It is possible to restore the idols to their correct pedestals for all valid input.

SAMPLE OUTPUT

```
0 1
4 5
3 4
3 0
1 5
0 5
-1 -1
```