Minimum Swaps 2

HackerRank

You are given an unordered array consisting of consecutive integers ∈ [1, 2, 3, ..., n] without any duplicates. You are allowed to swap any two elements. Find the minimum number of swaps required to sort the array in ascending order.

Example

$arr = [7, 1, 3, 2, 4, 5, 6]$

Perform the following steps:

```
i   arr                         swap (indices)
0   [7, 1, 3, 2, 4, 5, 6]   swap (0,3)
1   [2, 1, 3, 7, 4, 5, 6]   swap (0,1)
2   [1, 2, 3, 7, 4, 5, 6]   swap (3,4)
3   [1, 2, 3, 4, 7, 5, 6]   swap (4,5)
4   [1, 2, 3, 4, 5, 7, 6]   swap (5,6)
5   [1, 2, 3, 4, 5, 6, 7]
```

It took 5 swaps to sort the array.

Function Description

Complete the function *minimumSwaps* in the editor below.

minimumSwaps has the following parameter(s):

- *int arr[n]:* an unordered array of integers

Returns

- *int:* the minimum number of swaps to sort the array

Input Format

The first line contains an integer, n, the size of arr.
The second line contains n space-separated integers $arr[i]$.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq arr[i] \leq n$

Sample Input 0

```
4
4 3 1 2
```

Sample Output 0

```
3
```

Explanation 0

Given array arr : $[4, 3, 1, 2]$
After swapping $(0, 2)$ we get arr : $[1, 3, 4, 2]$
After swapping $(1, 2)$ we get arr : $[1, 4, 3, 2]$
After swapping $(1, 3)$ we get arr : $[1, 2, 3, 4]$
So, we need a minimum of 3 swaps to sort the array in ascending order.

Sample Input 1

```
5
2 3 4 1 5
```

Sample Output 1

```
3
```

Explanation 1

Given array arr : $[2, 3, 4, 1, 5]$
After swapping $(2, 3)$ we get arr : $[2, 3, 1, 4, 5]$
After swapping $(0, 1)$ we get arr : $[3, 2, 1, 4, 5]$
After swapping $(0, 2)$ we get arr : $[1, 2, 3, 4, 5]$
So, we need a minimum of 3 swaps to sort the array in ascending order.

Sample Input 2

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

Sample Output 2

```
3
```

Explanation 2

Given array arr : $[1, 3, 5, 2, 4, 6, 7]$
After swapping $(1, 3)$ we get arr : $[1, 2, 5, 3, 4, 6, 7]$
After swapping $(2, 3)$ we get arr : $[1, 2, 3, 5, 4, 6, 7]$
After swapping $(3, 4)$ we get arr : $[1, 2, 3, 4, 5, 6, 7]$
So, we need a minimum of 3 swaps to sort the array in ascending order.