Minimum Swaps 2 ☆

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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. You need to find the minimum number of swaps required to sort the array in ascending order.

For example, given the array $arr = [7, 1, 3, 2, 4, 5, 6]$ we 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. It must return an integer representing the minimum number of swaps to sort the array.

minimumSwaps has the following parameter(s):

- arr: an unordered array of integers

Input Format

The first line contains an integer, n, the size of arr.

The second line contains n space-separated integers $arr[i]$.

Constraints

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

Output Format

Return the minimum number of swaps to sort the given array.

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.

Change Theme C++

```cpp
#include <bits/stdc++.h>

using namespace std;

vector<string> split_string(string);

// Complete the minimumSwaps function below.
int minimumSwaps(vector<int> arr) {
    int n=arr.size();
    int cnt=0;
    int ans=0;
    vector<bool> visited(n,false);
    for(int i=0;i<n;i++){
        cnt=0;
        if(!visited[i] &&arr[i]!=i+1){
            int ind=i;
            while(!visited[ind]){
                // cout<<"Index: "<<ind<<"\n";
                // cout<<"Vis[0: "<<visited[0]<<"  Vis[1]: "<<visited[1]<<"  Vis[2]: "<<visited[2]<<"  Vis[3]: "<<visited[3]<<"\n";
                cnt+=1;
                visited[ind]=true;
                ind=arr[ind]-1;
                //cout<<"next index: "<<ind<<"\n";
```

```
            }
            //cout<<"cnt: "<<cnt<<"\n";
            ans+=cnt-1;
        }
        visited[i]=true;
    }
    return ans;

}

int main()
{…
}

vector<string> split_string(string input_string) {…
}
```

Line: 25 Col: 15

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Congratulations

You solved this challenge. Would you like to challenge your friends?

Next Challenge

- Test case 0
- Test case 1
- Test case 2
- Test case 3
- Test case 4
- Test case 5
- Test case 6

Compiler Message

Success

Input (stdin) Download

```
4
4 3 1 2
```

Expected Output Download

```
3
```