Cycle Sort:

Unsorted Array -

0	1	2	3	4
3	5	2	1	4

When given numbers from range 1; N
↳ Use cyclic sort.

As soon as you see 1 to N you should implement cyclic sort.

Algorithm

worst case example. Had to make N-1 swaps

3, 5, 2, 1, 4 — N = 5

index: value - 1
↳ because index value starts from 0.

After sorting -

0	1	2	3	4
1	2	3	4	5

(3), 5, 2, 1, 4 is 3 at the correct index? No 3-1 = (2)

swap

(2), 5, 3, 1, 4 swap with index 1 (2-1)

swap

(5), 2, 3, 1, 4

swap.

(4), 2, 3, 1, 5

swap

(1) (2) (3) (4) (5) It will check if every one is at the correct index

∴ Ans - 1, 2, 3, 4, 5

The while loop to put everything in the correct place will be N-1 swaps. are to be made.

In worst case - (2N-1)
(N-1) + N comparisons are made.
∴ O(N)