

## IOI Training Camp 2013 – Online Test 3, 27–28 April, 2013

### An Odd Sort

We have an array  $A$  and we want to sort it in non-decreasing order. The only operation allowed is to move one element of the array to any other position in the array—before all elements, after all elements or between any pair of adjacent elements. The cost of a single operation is equal to the value of the element that is moved. We want to minimize the total cost of sorting the array using this operation.

For example, suppose we have an array  $[7, 1, 2, 3]$ . We can sort it by moving 7 from the beginning of the array to the end of the array. But the cost of this operation is 7 which is not optimal. The optimal sorting procedure is to consecutively move 1, 2 and 3 to the proper places before 7. The total cost of these three operations is  $1 + 2 + 3 = 6$ , which is less than 7.

You will be given an array. Your task is to output the minimum total cost required to sort the array.

### Input format

- The first line contains a single integer,  $N$ .
- The second line contains  $N$  space separated integers.

### Output format

A single line, containing a single integer: the minimum total cost required to sort the array.

### Test data

In all testcases, the contents of the array will be between 1 and 5000, inclusive.

- Subtask 1 (20 marks) :  $1 \leq N \leq 10$ .
- Subtask 2 (80 marks) :  $1 \leq N \leq 5000$ .

### Sample input 1

```
4
7 1 2 3
```

### Sample output 1

```
6
```

### Sample input 2

```
6
8 2 6 5 1 4
```

### Sample output 2

```
18
```

### Limits

- *Memory limit* : 128 MB
- *Time limit* : 4s