

# Lab 7 - OJ Divide and Conquer

CS208 Algorithm Design and Analysis

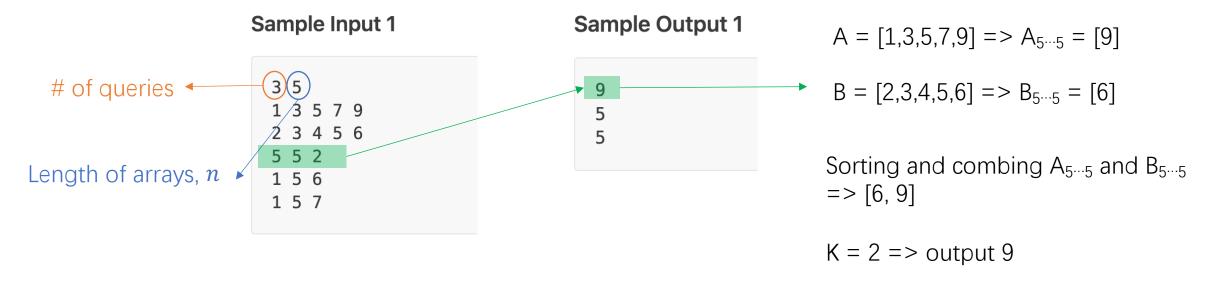
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# Q1: K-th element

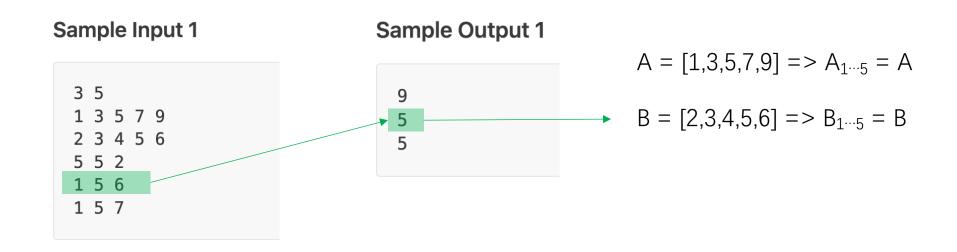
## **Description**

You are given two **non-decreasing** arrays A,B. Their length are both n. Now please output the kth element after combining the two subarray A[l...r] and B[l...r] and sorting the combined array in ascending order.





# Q1: K-th element



Sorting and combing  $A_{1\cdots 5}$  and  $B_{1\cdots 5}$  => [1,2,3,3,4,5,5,6,7,9]

$$K = 6 => output 5$$



# Q2: Range sum

### **Description**

You are given an array A and two integers L and R.

Let's define  $S(l,r) = \sum_{i=l}^r A_i \ (l \leq r)$ .

Please calculate the numbers of pair (l,r) satisfying  $L \leq S(l,r) \leq R$  and  $l \leq r$ .

### **Input Format**

The first line contains three integers n,L,R, denoting the length of array and the two integers L,R.

The second line contains n integers  $A_i$  ( $-10^4 \le A_i \le 10^4$ ), denoting the elements of array A.

### **Output Format**

One line, one integer indicating the answer.

#### Sample Input 1

#### Sample Output 1

19



# Q2: Range sum

#### Sample Input 1

### Sample Output 1

19

$$n = 7$$
, L = -11, R = 9

$$A = [-3, 9, -11, 20, -4, -7, 6]$$

$$Sum(1, 1) = -3$$
  
 $Sum(1, 2) = -3 + 9 = 6$   
...

$$Sum(6, 7) = -7 + 6 = -1$$
  
 $Sum(7, 7) = 6$ 

19 pairs satisfying  $-11 \le Sum(l,r) \le 9$