National Institute of Technology Calicut
Department of Computer Science and Engineering
Third Semester B. Tech.(CSE)
CS2092D Programming Laboratory
Assignment 2-Clarifications

Modifications for I, III and IV: **Do not print the number of comparisons or array cell probes.**

Note: 1st, 2nd and 3rd questions should be implemented with Binary Search thinking. Modified lines are highlighted in blue.

Hint for 1st Question: ($A[i] - i - 1$ gives the number of elements missing in the array upto index i(inclusive) (i.e., in the subarray A[0, i]))

- **Resulting Changes in the Input Out Format, and Test Cases**
  - Question No: 1

    Input Format:
    - The first line is an integer $n \in [1, 10^6]$.
    - The second line contains 'n' integer numbers within the range $\in [1, 10^5]$ separated by a space , representing the array elements.
    - The third line of the input is an integer $k \in [1, 10^9]$

    Output Format:
    - An integer representing k-th missing number

    Sample Input 1:
    6
    1 2 3 6 8 10
    3
    Sample Output 1:
    7

    Sample Input 2:
    5
    4 9 10 14 19
    5
    Sample Output 2:
    6

    Sample Input 3:
    5
    1 2 4 5 6
    3
    Sample Output 3:
    -1

    Sample Output 3- Explanation:
    $A[n-1] - n = 6 - 5 = 1$, which means only one element is missing in the array. Here $k = 3$, so there is no k^{th} missing element. So we print -1.

  - Question 3:

    Input Format:
    - First line contains the number of elements 'n' in the array $n \in [1, 10^3]$.

* Second line contains the elements in the array $arr \in [-10^3, 10^3]$.

Output Format:

* **an integer containing the peak element.**

Sample Input 1:
9
1 3 5 6 7 8 5 3 2

Sample Output 1:
8

Sample Input 2:
5
1 2 3 4 5

Sample Output 2:
5

– Question 4:

Input Format:

* The first line is an integer $n \in [1, 10^7]$, total numbers in the scroll.
* The second line contains 'n' integer numbers within the range $\in [0, 10^8]$ separated by a space, indicating a sequence of numbers inside the scroll.
* The third line is an integer $k \in [1, 10^7]$, the secret number.

Output Format:

* An integer representing the secret number's position. If the secret number is not present, print -1.

Sample Input 1:
9
5 6 7 8 9 10 1 2 3
10
Sample Output 1:
5

Sample Input 2:
4
3 5 1 2
8
Sample Output 2:
-1