

# 703. Kth Largest Element in a Stream

## Description

Design a class to find the  $k^{\text{th}}$  largest element in a stream. Note that it is the  $k^{\text{th}}$  largest element in the sorted order, not the  $k^{\text{th}}$  distinct element.

Implement `KthLargest` class:

- `KthLargest(int k, int[] nums)` Initializes the object with the integer `k` and the stream of integers `nums`.
- `int add(int val)` Appends the integer `val` to the stream and returns the element representing the  $k^{\text{th}}$  largest element in the stream.

### Example 1:

#### Input

```
["KthLargest", "add", "add", "add", "add", "add"]  
[[3, [4, 5, 8, 2]], [3], [5], [10], [9], [4]]
```

#### Output

```
[null, 4, 5, 5, 8, 8]
```

#### Explanation

```
KthLargest kthLargest = new KthLargest(3, [4, 5, 8, 2]);  
kthLargest.add(3);    // return 4  
kthLargest.add(5);    // return 5  
kthLargest.add(10);   // return 5  
kthLargest.add(9);    // return 8  
kthLargest.add(4);    // return 8
```

### Constraints:

- $1 \leq k \leq 10^4$
- $0 \leq \text{nums.length} \leq 10^4$
- $-10^4 \leq \text{nums}[i] \leq 10^4$
- $-10^4 \leq \text{val} \leq 10^4$
- At most  $10^4$  calls will be made to `add`.
- It is guaranteed that there will be at least `k` elements in the array when you search for the  $k^{\text{th}}$  element.

