题目：

Find the **k**th largest element in an unsorted array. Note that it is the kth largest element in the sorted order, not the kth distinct element.

For example,

Given [3,2,1,5,6,4] and k = 2, return 5.

Note:

You may assume k is always valid, 1 ≤ k ≤ array's length.

1.时间：O（N）；空间：O（LOGN）

```
class Solution {
public:
    int findKthLargest(vector<int>& nums, int k) {
        if (nums.empty() || k > nums.size() || k < 1) return 0;
        k = nums.size() - k;
        int index = partition(nums, 0, nums.size() - 1);
        while (index != k){
            if (index < k) index = partition(nums, index + 1, nums.size() - 1);
            else index = partition(nums, 0, index - 1);
        }
        return nums[index];
    }
private:
    int partition(std::vector<int>& nums, int lower, int upper){
        if (lower >= upper) return lower;
        int num = nums[lower];
        while (lower < upper){
            while (lower < upper && nums[upper] >= num) --upper;
            nums[lower] = nums[upper];
            while (lower < upper && nums[lower] <= num) ++lower;
            nums[upper] = nums[lower];
        }
        nums[lower] = num;
        return lower;
    }
};
```