378. Kth Smallest Element in a Sorted Matrix

Description | Hints | Submissions | Discuss | Solution

Pick One

Given a *n* x *n* matrix where each of the rows and columns are sorted in ascending order, find the kth smallest element in the matrix.

Note that it is the kth smallest element in the sorted order, not the kth distinct element.

Example:

```
matrix = [
   [ 1,  5,  9],
   [10, 11, 13],
   [12, 13, 15]
],
k = 8,

return 13.
```

Note:

You may assume k is always valid, $1 \le k \le n^2$.

```
/**
 * 维护一个size为k的大顶堆，存放着最小的k个元素，
 * 遍历数组当遍历到大于k个元素后，判断每个元素是否小于堆顶，若小于，则加入堆，并维持堆size不变
 * 遍历完成，则堆顶就是第k个元素
 */
public int kthSmallest(int[][] matrix, int k) {
    PriorityQueue<Integer> heap = new PriorityQueue<Integer>(new Comparator<Integer>() {
        public int compare(Integer arg0, Integer arg1) {
            if(arg0 > arg1)
                return -1;
            else if (arg0 < arg1) {
                return 1;
            }
            return 0;
        }});
    for(int i = 0; i < matrix.length; i ++) {
        for(int j = 0; j < matrix.length; j ++) {
            if(i * matrix.length + j + 1 > k) {
                if(matrix[i][j] < heap.peek()) {
                    heap.poll();
                    heap.offer(matrix[i][j]);//这是优先队列的插入数据操作。
                }
            }else {
                heap.offer(matrix[i][j]);
            }
        }
    }
return heap.peek();
}
}
```