

of res
N-W+1

initial window
0 ~ w-1
1 ~ w

0 1 2 3 4 5 6
[4, 3, 5, 4, 3, 6, 7]

4
↑
0
big small

```
def maxSlidingWindow(self, nums: List[int], w: int) -> List[int]:
    if nums is None or w < 1 or len(nums) < w: filter invalid
        return None
    qmax = deque() store idx to check expired position
    res = [0] * (len(nums) - w + 1)
    idx = 0
    for R in range(len(nums)): tail of deque (smallest)
        while qmax and nums[qmax[-1]] <= nums[R]:
            qmax.pop() out > tail tail out
        qmax.append(R) 0-3
        if qmax[0] == R - w: (position require to pop left)
            qmax.popleft()
        if R >= w - 1: eligible window
            collect ans res[idx] = nums[qmax[0]]
            idx += 1 value of head of deque
    return res
```

0 1 2 3 4 5 6
[4, 3, 5, 4, 3, 6, 7]

4
↑
0
big small
0 3
R-W = -3 ≠ head (store idx)
skip 2 if qmax(s)

4 3
↑ ↑
0 1
big small
1 3
R-W = -2 ≠ head (store idx)
skip 2 if qmax(s)

4 3
↑ ↑
0 1
big small
3 < 5
[0] [2]
out

4 < 5
[0]
out

5
↑
2
big small
5
empty already
2 3
R-W = 0 = head (store idx)
qmax(s)

R >= w - 1
collect res
res[0] = 5 [6]

5 4
↑ ↑
2 3
big small
3 3
R-W = 1 ≠ head (store idx)
qmax(s)
R >= w - 1
res[1] = 5 [5, 6]

5 4 3
↑ ↑ ↑
2 3 4
big small
4 3
R-W = 2 ≠ head (store idx)
qmax(s)
R >= w - 1
res[2] = 5 [5, 6, 5]

239. Sliding Window Maximum
Hard
1.4.9K
409

You are given an array of integers `nums`, there is a sliding window of size `k` which is moving from the very left of the array to the very right. You can only see the `k` numbers in the window. Each time the sliding window moves right by one position.

Return the max sliding window.

Example 1:

Input: `nums = [1,3,-1,-3,5,3,6,7]`, `k = 3`
Output: `[3,3,5,5,6,7]`
Explanation:

Window position	Max
[1 3 -1]	3
[3 -1 -3]	3
[1 3 -3]	5
[3 -1 -3]	5
[1 3 -3]	6
[3 -1 -3]	7

Example 2:

Input: `nums = [1]`, `k = 1`
Output: `[1]`

Constraints:

- $1 \leq \text{nums.length} \leq 10^5$
- $-10^4 \leq \text{nums}[i] \leq 10^4$
- $1 \leq k \leq \text{nums.length}$

8-3+1=6

0 1 2 3 4 5 6
[4, 3, 5, 4, 3, 6, 7]