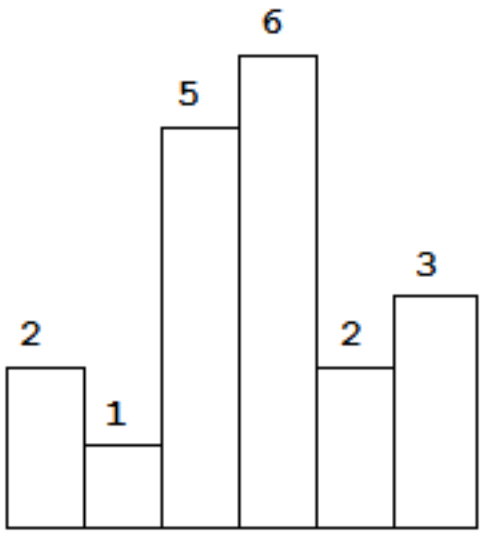
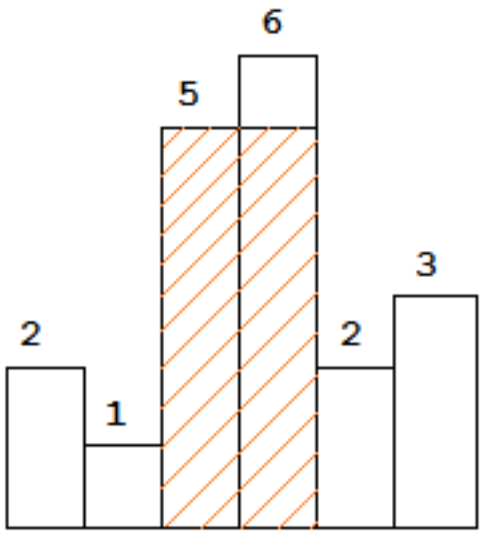
```
class Solution {
    public int largestRectangleArea(int[] heights) {
        Stack<Integer> stack = new Stack<>();
        int max = 0;
        for (int i = 0; i <= heights.length; i++){
            if (stack.isEmpty() ||
                (i != heights.length && heights[i] >= heights[stack.peek()])) {
                stack.push(i);
            } else {
                int index = stack.pop();
                max = Math.max(max, heights[index] * (stack.isEmpty() ?
                                                      i : i - stack.peek() - 1));
                i--;
            }
        }
        return max;
    }
}
```

Given *n* non-negative integers representing the histogram's bar height where the width of each bar is 1, find the area of largest rectangle in the histogram.



Above is a histogram where width of each bar is 1, given height = `[2,1,5,6,2,3]`.



The largest rectangle is shown in the shaded area, which has area = `10` unit.

Example:

```
Input: [2,1,5,6,2,3]
Output: 10
```