

pse

0	1	2	3	4	5
7	-1	1	2	1	4

nse

1	6	4	4	6	6
---	---	---	---	---	---

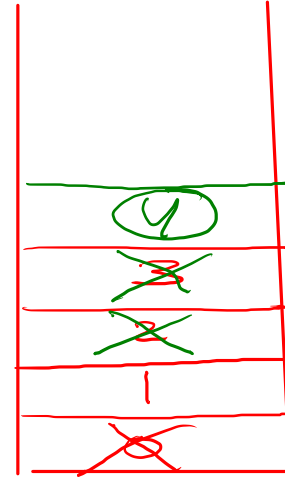
```

Stack<Integer> stack1 = new Stack<>();
Stack<Integer> stack2 = new Stack<>();
pse[0]=-1;
stack1.push(0);
for(int i=1;i<n;i++){
    while(stack1.size()>0 && arr[stack1.peek()] >=
arr[i]){
        stack1.pop();
    }
    if(stack1.size()==0){
        pse[i]=-1;
    }else{
        pse[i]= stack1.peek();
    }
    stack1.push(i);
}

```

0	1	2	3	4	5
-1	-1	1	2	1	4

arr[4] >= arr[5]
2 >= 3



arr[0] >= arr[1]

2 >= 1

1 >= 4

6
2 1 5 6 2 3

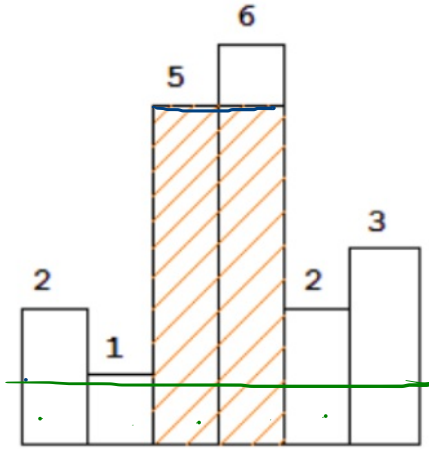
1 1

5 >= 2

arr[1] >= arr[4]

1 >= 2

$$5 \times 2 = 10$$



pre

post

2 1 5 6 2 3

Your Output (stdout)

[-1, -1, 1, 2, 1, 4]

[1, 6, 4, 4, 6, 6]

0

Expected Output

$$nse[i] - pse[i] - 1$$

$$4 - (-1) - 1$$

$$4 - 1 - 1$$

$$4 - 2 = 2$$

$$5 \times 2 = 10$$

$$\text{maxheight} = 0$$

Largest Rectangle in Histogram 5

```
public static void main(String[] args) {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
    Scanner sc = new Scanner(System.in);
    int n = sc.nextInt();
    int[] arr = new int[n];
    for(int i=0;i<n;i++){
        arr[i]=sc.nextInt();
    }
    int ans = largestRectangle(arr,n);
    System.out.println(ans);
}

public static int largestRectangle(int[] arr,int n){
    int[] pse = new int[n];
    int[] nse = new int[n];
    Stack<Integer> stack1 = new Stack<>();
    Stack<Integer> stack2 = new Stack<>();
    pse[0]=-1;
    stack1.push(0);
    for(int i=1;i<n;i++){
        while(stack1.size()>0 && arr[stack1.peek()] >= arr[i]){
            stack1.pop();
        }
        if(stack1.size()==0){
            pse[i]=-1;
        }else{
            pse[i]= stack1.peek();
        }
        stack1.push(i);
    }

    // NSE
    nse[n-1]=n;
```

```
// NSE
```

```
nse[n-1]=n;
stack2.push(n-1);
for(int i=n-2;i>=0;i--){
    while(stack2.size()>0 && arr[stack2.peek()] >= arr[i]){
        stack2.pop();
    }
    if(stack2.size()==0){
        nse[i]=n;
    }else{
        nse[i]= stack2.peek();
    }
    stack2.push(i);
}
// System.out.println(Arrays.toString(pse));
// System.out.println(Arrays.toString(nse));

int maxarea=0;
for(int i=0;i<n;i++){
    int width = nse[i] - pse[i]-1;
    int area = arr[i]*width;
    if(area>maxarea){
        maxarea = area;
    }
}
return maxarea;
```

```
}
```

HW_Facing the sun

```
public class Solution {  
  
    public static void main(String[] args) {  
        /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be r  
        Scanner sc = new Scanner(System.in);  
        int n = sc.nextInt();  
        int[] arr = new int[n];  
        for(int i=0;i<n;i++){  
            arr[i]=sc.nextInt();  
        }  
        System.out.println(facingsun(arr,n));  
    }  
    public static int facingsun(int[] arr,int n){  
        // ArrayList<Integer> list = new ArrayList<>();  
        // list.add(arr[0]);  
        // for(int i=1;i<n;i++){  
        //     if(arr[i]>=list.get(list.size()-1)){  
        //         list.add(arr[i]);  
        //     }  
        // }  
        // return list.size();  
  
        Stack<Integer> st = new Stack<>();  
        st.push(arr[0]);  
        for(int i=1;i<n;i++){  
            if(arr[i]>=st.peek()){  
                st.push(arr[i]);  
            }  
        }  
        return st.size();  
    }  
}
```
