

# Problem 84: Largest Rectangle in Histogram

## Problem Information

**Difficulty:** Hard

**Acceptance Rate:** 48.67%

**Paid Only:** No

**Tags:** Array, Stack, Monotonic Stack

## Problem Description

Given an array of integers `heights` representing the histogram's bar height where the width of each bar is `1`, return \_the area of the largest rectangle in the histogram\_.

**Example 1:**



**Input:** heights = [2,1,5,6,2,3] **Output:** 10 **Explanation:** The above is a histogram where width of each bar is 1. The largest rectangle is shown in the red area, which has an area = 10 units.

**Example 2:**



**Input:** heights = [2,4] **Output:** 4

**Constraints:**

\* `1 <= heights.length <= 105` \* `0 <= heights[i] <= 104`

## Code Snippets

**C++:**

```
class Solution {  
public:  
    int largestRectangleArea(vector<int>& heights) {  
  
    }  
};
```

**Java:**

```
class Solution {  
public int largestRectangleArea(int[] heights) {  
  
}  
}
```

**Python3:**

```
class Solution:  
    def largestRectangleArea(self, heights: List[int]) -> int:
```