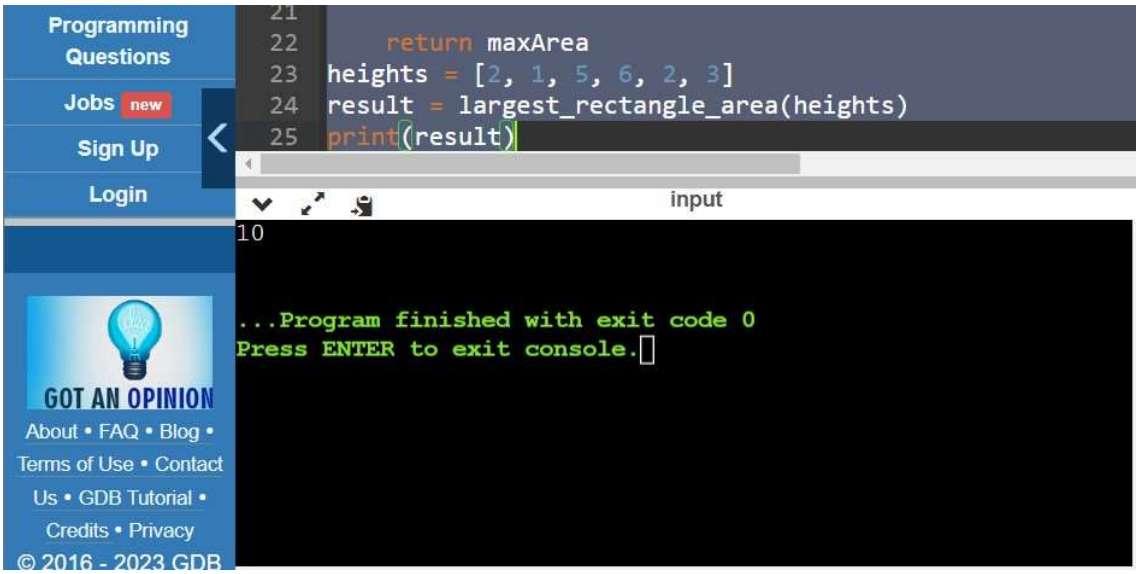
Problem 3: Given an array of integers heights representing the histogram's bar height where the width of each bar is 1 return the area of thelargest rectangle in histogram.

```
def largest_rectangle_area(heights):
stack = []
maxArea = 0
i = 0

while i < len(heights):
    if not stack or heights[i] >= heights[stack[-1]]:
        stack.append(i)
        i += 1
    else:
        top = stack.pop()
        width = i if not stack else i - stack[-1] - 1
        area = heights[top] * width
        maxArea = max(maxArea, area)

while stack:
    top = stack.pop()
    width = i if not stack else len(heights) - stack[-1] - 1
    area = heights[top] * width
    maxArea = max(maxArea, area)

return maxArea
heights = [2, 1, 5, 6, 2, 3]
result = largest_rectangle_area(heights)
print(result)
```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21
22 return maxArea
23 heights = [2, 1, 5, 6, 2, 3]
24 result = largest_rectangle_area(heights)
25 print(result)
input
10
...Program finished with exit code 0
Press ENTER to exit console.