Description | Editorial | Solutions | Submissions

# 56. Merge Intervals

Solved

Medium | Topics | Companies

Given an array of `intervals` where `intervals[i] = [start_i, end_i]`, merge all overlapping intervals, and return *an array of the non-overlapping intervals that cover all the intervals in the input*.

**Example 1:**

```
Input: intervals = [[1,3],[2,6],[8,10],[15,18]]
Output: [[1,6],[8,10],[15,18]]
Explanation: Since intervals [1,3] and [2,6] overlap, merge them into [1,6].
```

**Example 2:**

```
Input: intervals = [[1,4],[4,5]]
Output: [[1,5]]
Explanation: Intervals [1,4] and [4,5] are considered overlapping.
```

**Constraints:**

- `1 <= intervals.length <= 10^4`
- `intervals[i].length == 2`
- `0 <= start_i <= end_i <= 10^4`

Example 3:

[ [6,8] , [1,9] , [2,4] , [4,7] ]

Output - [1,9]

Code

Python3 | Auto

```python
class Solution:
    def merge(self, intervals: List[List[int]]) -> List[List[int]]:

```

Description | Editorial | Solutions | Submissions

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Solved

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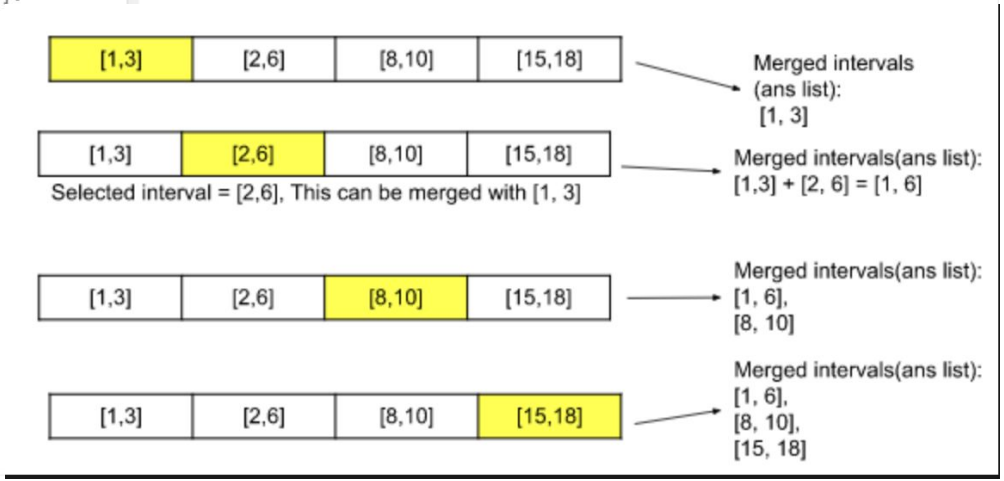
Code

Python3 | Auto

```
1  class Solution:
2      def merge(self, intervals: List[List[int]]) -> List[List[int]]:
3
```



Description | Editorial | Solutions | Submissions

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**Constraints:**

- `1 <= intervals.length <= 10^4`
- `intervals[i].length == 2`
- `0 <= start_i <= end_i <= 10^4`

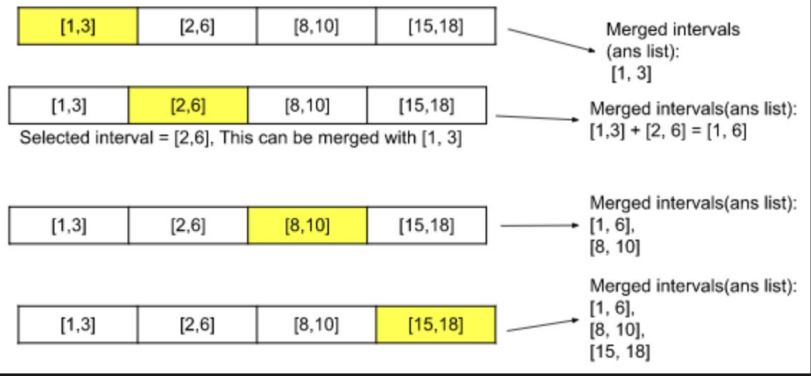
Seen this question in a real interview before? 1/5

Yes No

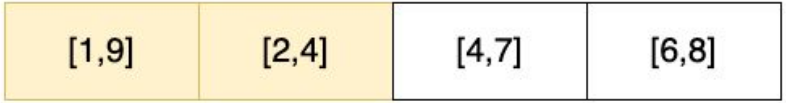
Code

Python3 Auto

```python
class Solution:
    def merge(self, intervals: List[List[int]]) -> List[List[int]]:
        merged = []
        #  Sort the intervals based on their start times. The lambda function lambda x: x[0] is used to extract the start time of each interval for comparison during sorting.
        intervals.sort(key=lambda x: x[0])
`# Initialize prev with the first interval from the sorted list.`
        prev = intervals[0]
# Iterate through the sorted intervals starting from the second interval (index 1) to the last interval.
        for interval in intervals[1:]:
            #If the start time of the current interval is less than or equal to the end time of the prev interval
            if interval[0] <= prev[1]:
                #Update the end time of the prev interval to maximum end time between prev and the current interval.
                prev[1] = max(prev[1], interval[1])
            else:
                #Intervals don't overlap, add the prev interval to the merged list
                merged.append(prev)
                #Update prev to be the current interval, this interval will be used for further comparisons.
                prev = interval
        #Adding the Last Interval
        merged.append(prev)
        return merged
```

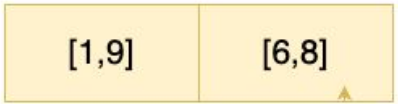



Sorting the array




Compares 2 and 9, since 2 < 9 it merges and takes max(4,9)


Compares 9 and 4, since 4 < 9 it merges and takes max(7,9)




Compares 9 and 6, since 6 < 9 it merges and takes max(8,9)

Description | Editorial | Solutions | Submissions

# 121. Best Time to Buy and Sell Stock

Solved

Easy | Topics | Companies

You are given an array `prices` where `prices[i]` is the price of a given stock on the $i^{th}$ day.

You want to maximize your profit by choosing a **single day** to buy one stock and choosing a **different day in the future** to sell that stock.

Return *the maximum profit you can achieve from this transaction*. If you cannot achieve any profit, return `0`.

**Example 1:**

```
Input: prices = [7,1,5,3,6,4]
Output: 5
Explanation: Buy on day 2 (price = 1) and sell on day 5 (price = 6), profit = 6-1 = 5.
Note that buying on day 2 and selling on day 1 is not allowed because you must buy before you sell.
```

**Example 2:**

```
Input: prices = [7,6,4,3,1]
Output: 0
Explanation: In this case, no transactions are done and the max profit = 0.
```

**Constraints:**

- `1 <= prices.length <= 10^5`
- `0 <= prices[i] <= 10^4`

Code

Python3 | Auto

```
1 class Solution:
2
3
```

Saving... Ln 2, Col 1

Problem List | Run | Submit | 0 | Premium

Description | Editorial | Solutions | Submissions

# 121. Best Time to Buy and Sell Stock

Solved

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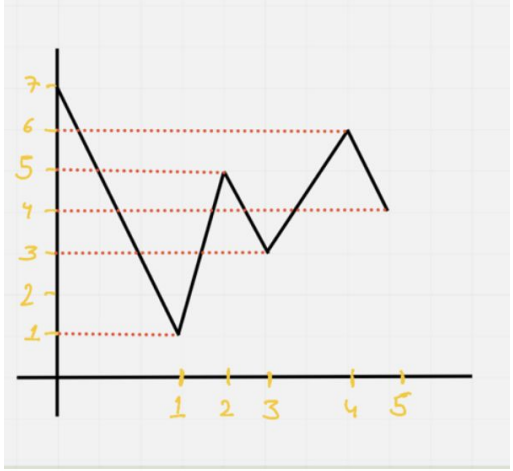
Code

Python3 | Auto

```
1 class Solution:
2
3
```




Left = 0
Right = 1

| Buy | Sell | Profit |
|---|---|---|
| 7 | 1 | -6 |
| 1 | 5 | 4 |
| 1 | 3 | 2 |
| 1 | 6 | 5 |

Saving...

Ln 2, Col 1

Description | Editorial | Solutions | Submissions

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Solved

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```

**Constraints:**

- `1 <= prices.length <= 10^5`
- `0 <= prices[i] <= 10^4`

Seen this question in a real interview before? 1/5

Code

Python3 | Auto

```python
class Solution:
    def maxProfit(self,prices):
        left = 0 #Buy
        right = 1 #Sell
        max_profit = 0
        while right < len(prices):
            currentProfit = prices[right] - prices[left] #our current Profit
            #price[left] < price[right] which means we will get profit
            if prices[left] < prices[right]:
                max_profit = max(currentProfit,max_profit)
            else:
                #Price[left] > price[right] so we will move left pointer to the right
                left = right
            right += 1
        return max_profit
```

Saved

Ln 15, Col 26

Description | Editorial | Solutions | Submissions

# 11. Container With Most Water

Solved

Medium | Topics | Companies | Hint

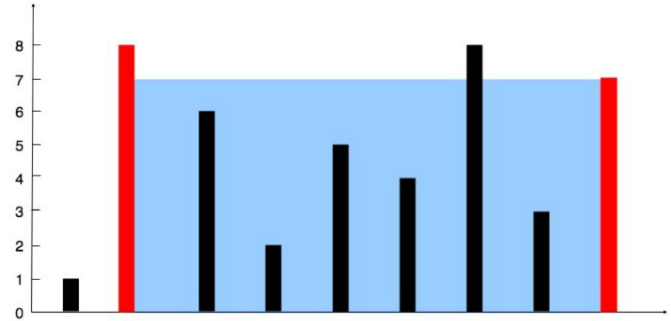
You are given an integer array `height` of length `n`. There are `n` vertical lines drawn such that the two endpoints of the `i^th` line are `(i, 0)` and `(i, height[i])`.

Find two lines that together with the x-axis form a container, such that the container contains the most water.

Return *the maximum amount of water a container can store*.

**Notice** that you may not slant the container.

**Example 1:**




```
Input: height = [1,8,6,2,5,4,8,3,7]
Output: 49
Explanation: The above vertical lines are represented by array [1,8,6,2,5,4,8,3,7]. In this case, the max area of water (blue section) the container can contain is 49.
```

**Example 2:**

```
Input: height = [1,1]
Output: 1
```

Code

Python3 | Auto

```
1 class Solution:
2
```

Saved | Ln 2, Col 1

Testcase | Test Result

1.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
 L                 R

Left pointer starts from index 0
Right pointer starts from the last index
```

2.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
   L             R

max_area = 8
```

3.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
   L             R

max_area = 8
current_area = 7 * 7 = 49
max_area = max(8, 49) = 49
Move R to next
```

4.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
   L           R

max_area = 49
current_area = 6 * 3 = 18
max_area = max(49, 18) = 49
Move R to next
```

5.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
   L         R

max_area = 49
current_area = 5 * 8 = 40
max_area = max(49, 40) = 49
Move L to next
```

6.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
     L       R

max_area = 49
current_area = 4 * 6 = 14
max_area = max(49, 24) = 49
Move L to next
```

7.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
       L     R

max_area = 49
current_area = 3 * 2 = 6
max_area = max(49, 6) = 49
Move L to next
```

8.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
         L   R

max_area = 49
current_area = 2 * 5 = 10
max_area = max(49, 10) = 49
Move L to next
```

9.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
           L R

max_area = 49
current_area = 1 * 4 = 4
max_area = max(49, 4) = 49
Move L to next
```

Now `L` and `R` are the same index. We shop iteration.

```
 0,1,2,3,4,5,6,7,8 (= index)
[1,8,6,2,5,4,8,3,7]
             L
             R
```

```
return 49
```

# 11. Container With Most Water

Solved

Medium | Topics | Companies | Hint

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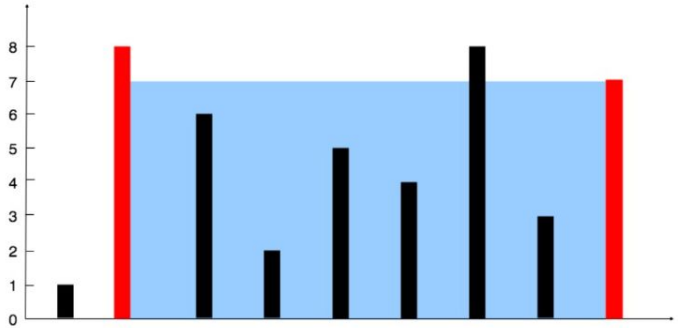


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Output: 49
Explanation: The above vertical lines are represented by array
[1,8,6,2,5,4,8,3,7]. In this case, the max area of water (blue section) the
container can contain is 49.
```

Code

Python3 Auto

```python
class Solution:
    def maxArea(self, height: List[int]) -> int:
        max_area = 0
        left = 0
        right = len(height) - 1

        while left < right: #Continue looping until left pointer is not equal to or exceeds the right pointer
            max_area = max(max_area, (right - left) * min(height[left], height[right]))
# Multiple width of the container and minimum of the heights of the two lines.
            if height[left] < height[right]:
                left += 1
            else:
                right -= 1
    return max_area
```

Saved

Ln 14, Col

Description | Editorial | Solutions | Submissions

# 152. Maximum Product Subarray

Medium Topics Companies

Given an integer array `nums`, find a subarray that has the largest product, and return *the product*.

The test cases are generated so that the answer will fit in a **32-bit** integer.

**Example 1:**

```
Input: nums = [2,3,-2,4]
Output: 6
Explanation: [2,3] has the largest product 6.
```

**Example 2:**

```
Input: nums = [-2,0,-1]
Output: 0
Explanation: The result cannot be 2, because [-2,-1] is not a subarray.
```

**Constraints:**

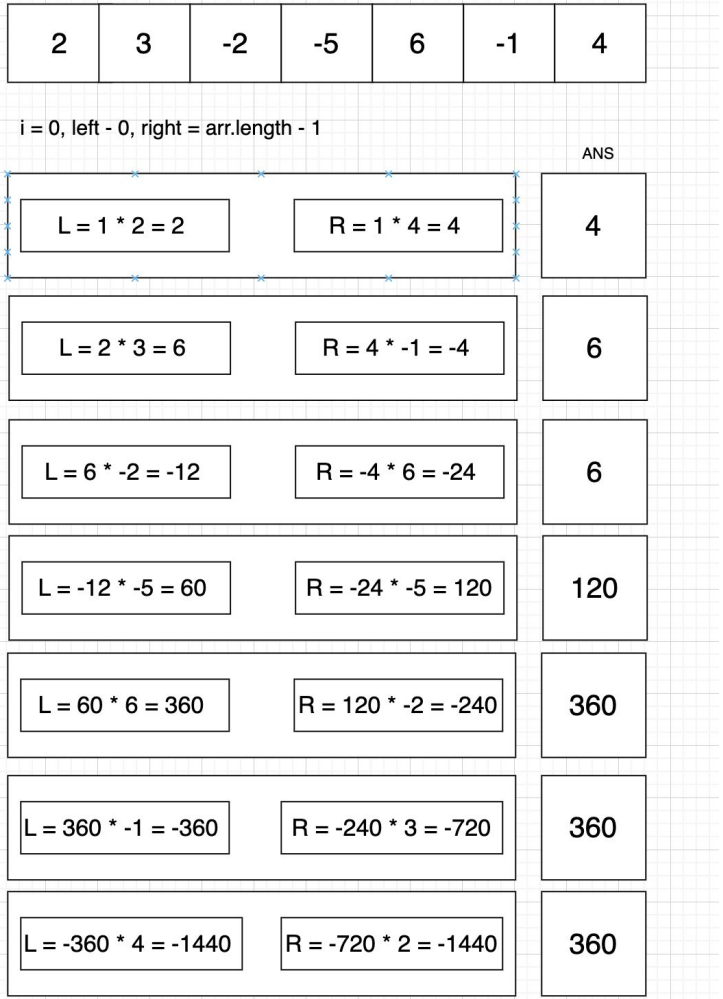
- `1 <= nums.length <= 2 * 10^4`
- `-10 <= nums[i] <= 10`
- The product of any subarray of `nums` is **guaranteed** to fit in a **32-bit** integer.

Code

Python3 Auto

```python
class Solution:
    def maxProduct(self, nums: List[int]) -> int:

```


2
3
-2
-5
6
-1
4
i = 0, left - 0, right = arr.length - 1
ANS
L = 1 * 2 = 2
R = 1 * 4 = 4
4
L = 2 * 3 = 6
R = 4 * -1 = -4
6
L = 6 * -2 = -12
R = -4 * 6 = -24
6
L = -12 * -5 = 60
R = -24 * -5 = 120
120
L = 60 * 6 = 360
R = 120 * -2 = -240
360
L = 360 * -1 = -360
R = -240 * 3 = -720
360
L = -360 * 4 = -1440
R = -720 * 2 = -1440
360

Problem List | Run | Submit

Description | Editorial | Solutions | Submissions

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Solved

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```
Input: nums = [-2,0,-1]
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```

**Constraints:**

- `1 <= nums.length <= 2 * 10^4`
- `-10 <= nums[i] <= 10`
- The product of any subarray of `nums` is **guaranteed** to fit in a **32-bit** integer.

Code

Python3 | Auto

```python
class Solution:
    def maxProduct(self, nums):
        n = len(nums)
        maxi = float('-inf')
        pre, suff = 1, 1

        for i in range(n):
            # When product becomes 0, make it 1
            if pre == 0:
                pre = 1
            if suff == 0:
                suff = 1
            pre *= nums[i]
            suff *= nums[n - i - 1]
            #Maximum of left vs right subarray
            maxi = max(maxi, max(pre, suff))

        return int(maxi)
```