# Question 1  
import numpy as np  
def find\_leaders(arr):  
 n = len(arr)  
 leaders = [arr[-1]]  
 max\_right = arr[-1]   
  
 for i in range(-2, -n, -1):  
 if arr[i] > max\_right:  
 leaders.append(arr[i])  
 max\_right = arr[i]   
  
 return leaders[::-1] # Reversing the leaders list to get the correct order  
  
# Test case  
arr = [7, 10, 4, 10, 6, 5, 2]  
result = find\_leaders(arr)  
print("Leaders of the array are : ",\*result)

Leaders of the array are : 10 6 5 2

#Question 2   
def max\_profit(prices):  
   
 if not prices or len(prices) > 105:  
 raise ValueError("Number of days cannot be greater than 105")  
  
 min\_price = prices[0]  
 max\_profit = 0  
  
 for price in prices:  
 if price > 104:   
 raise ValueError("Price of a stock can not be greater than 104")  
 else:   
 min\_price = min(min\_price, price)  
 profit = price - min\_price  
 max\_profit = max(max\_profit, profit)  
  
 return max\_profit  
  
# Test case 1  
prices = [7,1,5,3,6,4]  
Max\_profit = max\_profit(prices)  
print("Maximum profit that can be made: ", Max\_profit)  
# Testcase 2  
prices = [7,6,4,3,1]  
Max\_profit = max\_profit(prices)  
print("Maximum profit that can be made: ", Max\_profit)  
# I feel the constraint on stock price does not seem to be unreal though I worked with the given constraint

Maximum profit that can be made: 5  
Maximum profit that can be made: 0

# Question 3  
def XOR\_sum\_subset(nums):  
 def subset(start, subset\_xor):  
 nonlocal xor\_total  
 xor\_total += subset\_xor   
 for i in range(start, len(nums)):  
 subset(i + 1, subset\_xor ^ nums[i])   
  
 xor\_total = 0   
 subset(0, 0)   
 return xor\_total  
# Test case 1  
nums = [1, 3]  
print(f"Sum of XOR totals of every subset in {nums} is {XOR\_sum\_subset(nums)}")  
  
# Test case 2  
nums = [5,1,6]  
print(f"Sum of XOR totals of every subset in {nums} is {XOR\_sum\_subset(nums)}")

Sum of XOR totals of every subset in [1, 3] is 6  
Sum of XOR totals of every subset in [5, 1, 6] is 28

## Knowledge scale in the following domains:

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1. Knowledge on LANG Chain and LLM : 3\*
2. ML concepts and EDA : 4\*
3. Recommendation system : 1
4. RL : 2\*

*Here \* represents ongoing courses*