DSA Assignment Solutions and Other Information

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# DSA Solutions

1. Return the leader of an array

def leader(arr):

leader=[]

max\_right=float('-inf')

for i in range(len(arr)-1,-1,-1):

if arr[i]>max\_right:

leader.append(arr[i])

max\_right=arr[i]

leader.reverse()

return leader

print(leader([7, 10, 4, 10, 6, 5, 2]))

Optimization Approach:- The code iterates through the array in a single pass starting from the right side identifying the leaders and creating a list of leaders named leader. Also, as the array is traversed from right, the leader list is in ascending order so it is reversed to be obtained in descending order. Since, the array is traversed only once, the time complexity is O(n).

1. Return max possible profit from a list of stock prices. If no profit possible, return 0.

def max\_profit(stock\_price\_values):

if len(stock\_price\_values)<2:

return 0

max\_profit=0

min\_stock\_price=stock\_price\_values[0]

for stock\_price in stock\_price\_values[1:]:

if stock\_price<min\_stock\_price:

min\_stock\_price=stock\_price

else:

profit=stock\_price-min\_stock\_price

max\_profit=max(max\_profit, profit)

return max\_profit

print(max\_profit([7,1,5,3,6,4]))

1. Sum of all subset XOR Totals

def XOR\_total\_subsets(nums):

xor\_sum = 0

for num in nums:

xor\_sum|=num # Bitwise OR operation to accumulate all elements

return xor\_sum\*(2\*\*(len(nums)-1))

#The power set is of length 2\*\*(len(nums)-1)

print(XOR\_total\_subsets([1,3]))

print(XOR\_total\_subsets([5,1,6]))

# Other Information

1. Rating in Scale of DSA:- 4/5.

DSA Topics and algorithms I am good at:-

Structures:- Arrays, Strings, Linked List, Matrix, Stack, Queue

Algorithms:- Search(Linear, Binary, Ternary), Sort(Bubble, Selection, Insertion, Quick, Merge), Recursion, Mathematical Algorithms

1. Deep Learning Rating:- 4/5. I have not yet worked on a major GAN related project but I do know what they are and how they work and have trained a couple of GAN models. I have worked with CNNs and RNNs too. I have done NLP related projects and Computer Vision projects mostly using these models.
2. Appetite for research:- I have a keen interest in Deep Learning. I have knowledge of working with CNNs and RNNs so far and have done some work in GANs. I was in fact learning about GANs when I applied for this internship. The possibilities of Deep Learning are endless and I want to explore and contribute in this era Deep Learning. We see newer and better models appearing every passing day, bringing with them newer possibilities and newer solutions to problems. I come from a mathematical background as I am pursuing a major in Mathematics. From what I have observed so far in Deep Learning, my mathematical way of thinking helps me in understanding concepts quite easily. This is what made me develop the keen interest in Deep Learning and the appetite to learn more, explore and research in this field.
3. Leetcode/Hackerrank/Codechef ranking- I don’t do programming on these platforms. In fact, time is a major issue behind this. I am majoring in Mathematics and my interest is in Deep Learning, so I found reading research papers and coding on Kaggle to be more suited to my career interests. As far as my programming capabilities are concerned, rest assured, I won’t disappoint you at all. I am sure, You must have seen a glimpse of it in my assignments that I have submitted.