algorithm foundation

PROBLEM SOLVING

strategies

Problem Name	Original Statement	Inputs	Outputs	Constraints	Edge Cases
Two Sum	Given an array of integers nums and an integer target, return indices of the two numbers such that they add up to target	nums target	indices	//2<= len(nums) <=10000 //-10^9 <= nums[i] <= 10^9 //-10^9 <= target <= 10^9 exactly one solution	nums = [1,1], target = 2 nums = [-5,3,2] target = -2 nums = [10**9, -10**9, 0] target = 1
Reverse String	Write a function that reverses a string. The input string is given as an array of characters s	s	s	1 <= len(s) <= 10^5 s[i] is a printable ascii character must reverse in-place	s=[“”] s=[“a”] s=[a,b,a]
Valid Parentheses	Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.	s	True/ False	s contains only '() [] {}' 1 <= len(s) <= 10^4	s = ")(" s = "(]" s="(((" s="({[]})"

Problem Name	Original Statement	Inputs	Outputs	Constraints	Edge Cases
Best Time to Buy and Sell Stock	You are given an array prices where prices[i] is the price of a given stock on the ith 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.	prices	num	1 <= len(prices) <= 105 0 <= prices[i] <= 10^4	prices = [7,7,1,3,8,2] prices = [7,6,4,0] prices = [8]
Valid Palindrome	A phrase is a palindrome if, after converting all uppercase letters into lowercase letters and removing all non-alphanumeric characters, it reads the same forward and backward. Alphanumeric characters include letters and numbers. Given a string s, return true *if it is a* palindrome, or false *otherwise*.	s	True/ False	1 <= len(s) <= $2 * 10^5$ s consists only of printable ASCII characters	s=" a man,ama" s=" " s="rand d" s="6h6"

problem name	pseudocode	debugging

Two Sum	for each number i in nums:
	for each number j in nums:
	if i+j=target:
	return ndice[i,j]
		wrong syntax it was if i+j=target than i correct it into if i+j == target

Reverse String	j=1 for each i from 1 to len(s)/2: perm=s[i] s[i]=s[-i] s[-i]=perm j=j+1 return s	working with -i instead of new -j that start from the end cause i start from 0

Valid Parentheses	initialize an empty stack
	for each c in s:
	if c is opened: put it in the stack
	else:
	if stack empty: return False
	if the last element not match c : return False
	else : poop it
	if stack is empty after loop ends:
	return True
	else:
	return False
		a mistake in the indentation in the second condition

Best Time to Buy and Sell Stock	Max_prof=infinite
	price=prices[1]
	for each i from 0 to length prices:
	if price>prices[i]:
	price=prices[i]
	else: if Max_prof<prices[i]-price:
	Max_prof=prices[i]-price
	return Max_prof
		corrected the loop condition cause it was out of range

Valid Palindrome	Keep only alphanumeric characters
	Convert to lowercase
	n=lenth of s
	left=0 right=n-1
	while left<right:
	if s[left]!=s[right]:
	return false
	left=left+1
	right=right-1
	when loop ends return true
		forget the parentheses in the loop for of test
		it was an infinite loop because the condition of while was wrong

problem name	Time Complexity	Space Complexity
Two Sum	O(n^2)	O(1)
Reverse String	O(n)	O(1)
Valid Parentheses	O(n)	O(n)
Best Time to Buy and Sell Stock	O(n)	O(1)
Valid Palindrome	O(n)	O(n)