

CODING CLUB

Questions:

1. 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`.

You may assume that each input would have exactly one solution, and you may not use the same element twice.

You can return the answer in any order.

Example 1:

Input: `nums = [2,7,11,15]`, `target = 9`Output: `[0,1]`Explanation: Because `nums[0] + nums[1] == 9`, we return `[0, 1]`.

Example 2:

Input: `nums = [3,2,4]`, `target = 6`Output: `[1,2]`

Example 3:

Input: `nums = [3,3]`, `target = 6`Output: `[0,1]`

Constraints:

`2 <= nums.length <= 104`

`-109 <= nums[i] <= 109`

`-109 <= target <= 109`

Only one valid answer exists.

2. Longest Palindrome Sub-string

Given a string `s`, return the longest palindromic

Sub-string in `s`.

Example 1:

Input: `s = "babad"`

Output: `"bab"`

Explanation: `"aba"` is also a valid answer.

Example 2:

Input: `s = "cbbd"`

Output: `"bb"`

Constraints:

`1 <= s.length <= 1000`

3. Reverse Integer

Given a signed 32-bit integer x , return x with its digits reversed. If reversing x causes the value to go outside the signed 32-bit integer range $[-2^{31}, 2^{31} - 1]$, then return 0.

Assume the environment does not allow you to store 64-bit integers (signed or unsigned).

Example 1:

Input: $x = 123$

Output: 321

Example 2:

Input: $x = -123$

Output: -321

Example 3:

Input: $x = 120$

Output: 21

Constraints:

$-2^{31} \leq x \leq 2^{31} - 1$

4. Palindrome Number

Given an integer x , return true if x is a palindrome, and false otherwise.

Example 1:

Input: $x = 121$

Output: true

Explanation: 121 reads as 121 from left to right and from right to left.

Example 2:

Input: $x = -121$

Output: false

Explanation: From left to right, it reads -121. From right to left, it becomes 121-. Therefore it is not a palindrome.

Example 3:

Input: $x = 10$

Output: false

Explanation: Reads 01 from right to left. Therefore it is not a palindrome.

Constraints:

$-2^{31} \leq x \leq 2^{31} - 1$

5. Integer to Roman

Seven different symbols represent Roman numerals with the following values:

Symbol	Value
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

Example 1:

Input: num = 3749

Output: "MMMDCCXLIX"

Explanation:

3000 = MMM as 1000 (M) + 1000 (M) + 1000 (M)

700 = DCC as 500 (D) + 100 (C) + 100 (C)

40 = XL as 10 (X) less of 50 (L)

9 = IX as 1 (I) less of 10 (X)

Note: 49 is not 1 (I) less of 50 (L) because the conversion is based on decimal places

Example 2:

Input: num = 58

Output: "LVIII"

Explanation:

50 = L

8 = VIII

Example 3:

Input: num = 1994

Output: "MCMXCIV"

Explanation:

1000 = M

900 = CM

90 = XC

4 = IV

Constraints:

1 <= num <= 3999

6. Longest Common Prefix

Write a function to find the longest common prefix string amongst an array of strings.

If there is no common prefix, return an empty string "".

Example 1:

Input: strs = ["flower", "flow", "flight"]

Output: "fl"

Example 2:

Input: strs = ["dog", "racecar", "car"]

Output: ""

Explanation: There is no common prefix among the input strings.

Constraints:

$1 \leq \text{strs.length} \leq 200$

$0 \leq \text{strs}[i].\text{length} \leq 200$

strs[i] consists of only lowercase English letters.

7. Trio Sums to Zero

Given an integer array nums, return all the triplets [nums[i], nums[j], nums[k]] such that $i \neq j$, $i \neq k$, and $j \neq k$, and $\text{nums}[i] + \text{nums}[j] + \text{nums}[k] == 0$.

Notice that the solution set must not contain duplicate triplets.

Example 1:

Input: nums = [-1,0,1,2,-1,-4]

Output: [[-1,-1,2],[-1,0,1]]

Explanation:

$\text{nums}[0] + \text{nums}[1] + \text{nums}[2] = (-1) + 0 + 1 = 0$.

$\text{nums}[1] + \text{nums}[2] + \text{nums}[4] = 0 + 1 + (-1) = 0$.

$\text{nums}[0] + \text{nums}[3] + \text{nums}[4] = (-1) + 2 + (-1) = 0$.

The distinct triplets are [-1,0,1] and [-1,-1,2].

Notice that the order of the output and the order of the triplets does not matter.

Example 2:

Input: nums = [0,1,1]

Output: []

Explanation: The only possible triplet does not sum up to 0.

Example 3:

Input: nums = [0,0,0]

Output: [[0,0,0]]

Explanation: The only possible triplet sums up to 0.

Constraints:

$3 \leq \text{nums.length} \leq 3000$

$-105 \leq \text{nums}[i] \leq 105$

8. Trio Sum Closest

Given an integer array `nums` of length `n` and an integer `target`, find three integers in `nums` such that the sum is closest to `target`.

Return the sum of the three integers.

You may assume that each input would have exactly one solution.

Example 1:

Input: `nums = [-1,2,1,-4]`, `target = 1`

Output: 2

Explanation: The sum that is closest to the target is 2. $(-1 + 2 + 1 = 2)$.

Example 2:

Input: `nums = [0,0,0]`, `target = 1`

Output: 0

Explanation: The sum that is closest to the target is 0. $(0 + 0 + 0 = 0)$.

Constraints:

$3 \leq \text{nums.length} \leq 500$

$-1000 \leq \text{nums}[i] \leq 1000$

$-10^4 \leq \text{target} \leq 10^4$

9. Remove Nth element

Given the list, remove the `nth` element from the list and return it.

Example 1:

Input: `list = [1,2,3,4,5]`, `n = 3`

Output: `[1,2,3,5]`

Example 2:

Input: `list = [1]`, `n = 0`

Output: `[]`

Example 3:

Input: `list = [1,2]`, `n = 1`

Output: `[1]`

10. Parenthesis Balancing

Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

Open brackets must be closed by the same type of brackets.

Open brackets must be closed in the correct order.

Every close bracket has a corresponding open bracket of the same type.

Example 1:

Input: $s = "()"$

Output: true

Example 2:

Input: $s = "()[]{}"$

Output: true

Example 3:

Input: $s = "()["$

Output: false

Constraints:

$1 \leq s.length \leq 104$

s consists of parentheses only '()[]{}'.

11. Mirror & Water Images - Quadrants

The program must accept an integer matrix of size $R \times C$ as the input. The program must modify the matrix based on the following conditions.

- The top-right quadrant of the matrix is replaced with the mirror image of the top-left quadrant.
- Then the bottom-left quadrant of the matrix is replaced with the water image of the top-left quadrant.
- Then the bottom-right quadrant of the matrix is replaced with the mirror image of the bottom-left quadrant.

Finally, the program must print the modified matrix as the output.

Note: The values of R and C are always even.

Boundary Condition(s):

$2 \leq R, C \leq 50$

Input Format:

The first line contains R and C separated by a space.

The next R lines, each contains C integers separated by a space.

Output Format:

The first R lines, each contains C integers separated by a space.

Example Input/Output 1:

Input:

```
46
49 16 50 47 28 50
43 44 12 32 37 12
33 26 37 48 25 37
31 48 41 19 16 16
```

Output:

```
49 16 50 50 16 49
43 44 12 12 44 43
43 44 12 12 44 43
49 16 50 50 16 49
```

12. Pyramid as tall and wide as parameter passed

Input: 5

Output:

```
  *
 ***
*****
*****
*****
```

13. Pyramid in a right triangle as tall and wide as parameter passed

Input: 5

Output:

```
*
**
***
****
*****
```

14. Pyramid of Alphabets continuous as tall and wide as parameter passed

Input: 5

Output:

```
A
B C
D E F
G H I J
K L M N O
```

15. Pyramid of Alphabets non-continuous as tall and wide as parameter passed

Input: 5

Output:

```
A
C E
G I K
M O Q S
U W Y A C
```
