1. Two Sum

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

```
class Solution:
    def twoSum(self, nums, target):

        # for i in range(len(nums)):
        #     for j in range(1, (len(nums) - i)):
        #         if nums[i] + nums[i + j] == target:
        #             return i, i+j

        # for i in range(len(nums)):
        #     if i + 1 < len(nums):
        #         if nums[i] + nums[i + 1] == target:
        #             return i, i + 1
        # won't work as we have to check all the numbers not just corresponding

        test = {}
        # for i in range(len(nums)):
        #     if nums[i] in test:
        #         return test[nums[i]], i

        #     else:
        #         test[target - nums[i]] = i

        for i in range(len(nums)):
            if nums[i] not in test:
                test[target - nums[i]] = i
            else:
                return test[nums[i]], i


```

15. 3Sum (Medium)

Input: nums = [-1,0,1,2,-1,-4]
Output: [[-1,-1,2],[-1,0,1]]
Explanation:
nums[0] + nums[1] + nums[2] = (-1) + 0 + 1 = 0.
nums[1] + nums[2] + nums[4] = 0 + 1 + (-1) = 0.
nums[0] + nums[3] + 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.

```
class Solution:
    def threeSum(self, nums: List[int]) -> List[List[int]]:
        # res = []
        # nums.sort()
        # for i, a in enumerate(nums):
        #     if i > 0 and a == nums[i - 1]:
        #         continue
        #     l, r = i + 1, len(nums) - 1
        #     while l < r:
        #         s = a + nums[l] + nums[r]
        #         if s > 0:
        #             r -= 1
        #         elif s < 0:
        #             l += 0
        #         else:
        #             res.append([a, nums[l], nums[r]])
        #             l += 1
        #             while nums[l] == nums[l-1] and l < r:
        #                 l += 1
        # return res



        res = []
        nums.sort()
        for i, a in enumerate(nums):
            if i > 0 and a == nums[i-1]:
                continue
            l, r = i+1, len(nums)-1
            while l < r:
                s = a + nums[l] + nums[r]
                if s < 0:
                    l +=1
                elif s > 0:
                    r -= 1
                else:
                    res.append([a, nums[l], nums[r]])
                    l += 1
                    while l < r and nums[l] == nums[l-1]:
                        l += 1


        return res
```

26. Remove Duplicates from Sorted Array

Example 1:

Input: nums = [1,1,2]
Output: 2, nums = [1,2,_]

Explanation: Your function should return k = 2, with the first two elements of nums being 1 and 2 respectively.
It does not matter what you leave beyond the returned k (hence they are underscores).

Example 2:

Input: nums = [0,0,1,1,1,2,2,3,3,4]
Output: 5, nums = [0,1,2,3,4,_,_,_,_,_]
Explanation: Your function should return k = 5, with the first five elements of nums being 0, 1, 2, 3, and 4 respectively.
It does not matter what you leave beyond the returned k (hence they are underscores).

```python
class Solution:
    def removeDuplicates(self, nums: List[int]) -> int:
        x = 1
        for i in range(len(nums) - 1):
            if nums[i] != nums[i + 1]:
                nums[x] = nums[i + 1]
                x += 1
        return x
```

242. Valid Anagram

Example 1:

Input: s = "anagram", t = "nagaram"
Output: true

Example 2:

Input: s = "rat", t = "car"
Output: false

```python
class Solution:
    def isAnagram(self, s: str, t: str) -> bool:
        #return sorted(s) == sorted(t)
        if len(s) != len(t):
            return False
        else:

            test = {}
            for char in s:
                if char not in test:
                    test[char] = 1
                else:
                    test[char] += 1

            for char in t:
                if char not in test:
                    return False
                else:
```

```
            test[char] -= 1

    for v in test.values():
        if v != 0:
            return False
    return True
```

```
# print(stack)
# a = len(s)
# b = len(t)
# mx = a
# if b > a:
#     mx = b
# #j = -1

# if a != b:
#     return False
# else:
#     for i in range(a):
#         found = False
#         for j in range(b):
#             if t[j] == stack[j]:
#                 stack.pop()
#                 found = True
#                 print(char)
#                 print(stack)
#                 break
#         if found == False:
#             j -= 1
```

```
        #     # if len(stack) == 0:
        #     #     return True
        #     # else:
        #     #     return False
        #     return stack == []
```

66. Plus One

Example 1:

Input: digits = [1,2,3]
Output: [1,2,4]
Explanation: The array represents the integer 123.
Incrementing by one gives 123 + 1 = 124.
Thus, the result should be [1,2,4].

```
class Solution:
    def plusOne(self, digits: List[int]) -> List[int]:

        # if len(digits) == 1:
        #     if digits[0] == 9:
        #         digits[0] = 1
        #         #digits[1] = 0
        #         digits.append(0)
        #     else:
        #         digits[0] += 1
        #     return digits
        # else:

        #     sum = digits[0]
        #     for i in range(len(digits) - 1):
        #         sum = ((sum * 10) + digits[i + 1])

        #     digits.clear()

        #     sum += 1

        #     while sum != 0:
        #         x = sum % 10
        #         digits.append(x)
        #         sum //= 10
        #     digits.reverse()
        #     return digits
        #--------------------

        # sum = 0
        # for i in range(len(digits)):
```

```
        #     sum += digits[i] * pow(10, (len(digits) - 1 - i))
        #sum += 1
        #digits.clear()
        #x = str(sum)
        # for char in x:
        #     digits.append(int(char))
        # return digits
        # for i in range(len(x)):
        #     digits.append(int(x[i]))
        # return digits

        #-----------------------
        #one liner
        # return [int(char) for char in str(sum + 1)]
        s = ""
        for char in digits:
            s += str(char)
        sum = int(s) + 1
        digits.clear()
        for char in str(sum):
            digits.append(int(char))
        return digits
```

202. Happy Number

Input: n = 19
Output: true
Explanation:
$1^2 + 9^2 = 82$
$8^2 + 2^2 = 68$
$6^2 + 8^2 = 100$
$1^2 + 0^2 + 0^2 = 1$

```
class Solution:
    def isHappy(self, n: int) -> bool:
        # if n== 1:
        #     return True

        # s = str(n)
        # store = {}
        # x = 0
        # for char in s:
        #     x += pow(int(char), 2)
        # store[s] = x

        # while s in store.keys():

        #     s = str(store[s])
        #     if s in store:
        #         return False
        #     x = 0
        #     for char in s:
        #         x += pow(int(char), 2)
        #     if x == 1:
        #         return True
        #     store[s] = x
        if n == 1:
            return True

        s = set()
        while n != 1:
            x = 0
            # num = str(n)

            # for i in range(len(num)):
            #     x += int(num[i]) ** 2

            # for i in range(len(str(n))):
            #     x += (int(str(n)[i])) ** 2

            for char in (str(n)):
                x += (int(char)) ** 2
            n = x
            if n == 1:
                return True
            if n in s:
                return False
            else:
                s.add(n)
```

118. Pascal's Triangle

```
class Solution:
    def generate(self, numRows: int) -> List[List[int]]:
        res = [[1]]
        for i in range(numRows - 1):
            temp = [0] + res[-1] + [0]
            row = []
            for j in range(len(res[-1]) + 1):
                row.append(temp[j] + temp[j + 1])
            res.append(row)
        return res
```

88. Merge Sorted Array

Example 1:

Input: nums1 = [1,2,3,0,0,0], m = 3, nums2 = [2,5,6], n = 3
Output: [1,2,2,3,5,6]
Explanation: The arrays we are merging are [1,2,3] and [2,5,6].
The result of the merge is [1,2,2,3,5,6] with the underlined elements coming from nums1.

```
class Solution:
    def merge(self, nums1: List[int], m: int, nums2: List[int], n: int) -> None:
        """
        Do not return anything, modify nums1 in-place instead.
        """

        while m > 0 and n > 0:
            if nums1[m - 1] >= nums2[n - 1]:
                nums1[m + n - 1] = nums1[m - 1]
                m -= 1
            else:
                nums1[m + n -1] = nums2[n - 1]
                n -= 1
        if n > 0:
            nums1[:n] = nums2[:n]
```

169. Majority Element

Example 1:

Input: nums = [3,2,3]
Output: 3

Example 2:

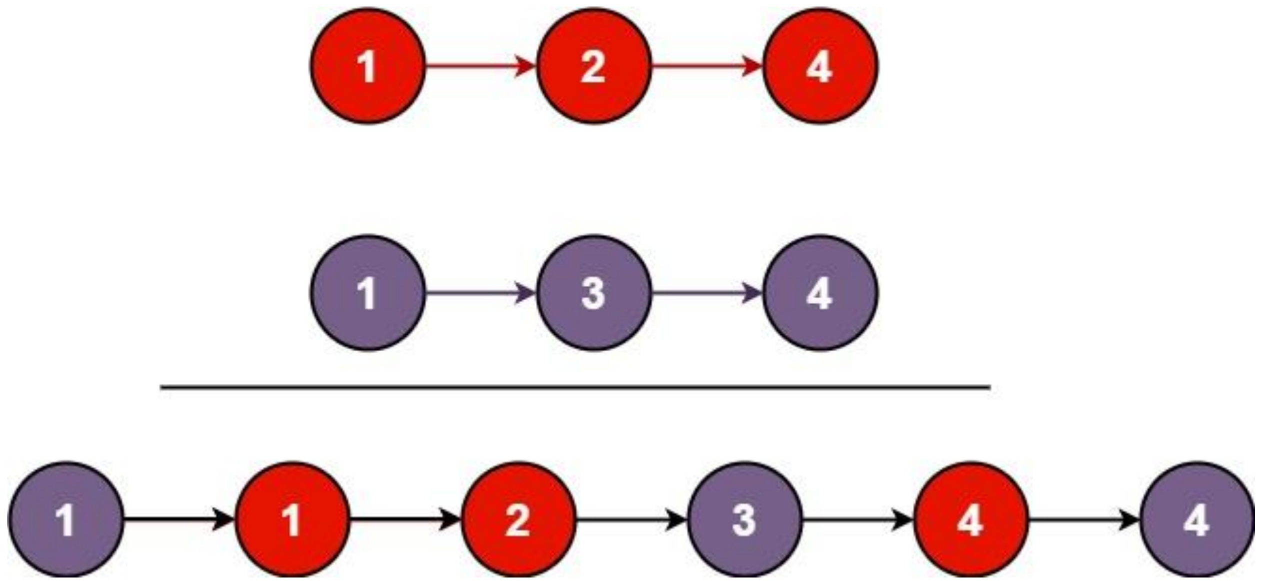
Input: nums = [2,2,1,1,1,2,2]
Output: 2

```
class Solution:
    def majorityElement(self, nums: List[int]) -> int:
        # test = {}
        # for char in nums:
        #     if char not in test:
        #         test[char] = 1
        #     else:
        #         test[char] += 1
        # mx = 0
        # for v in test.values():
        #     if v > (len(nums) / 2) and v > mx:
        #         mx = v
        # for key in test.keys():
        #     if test[key] == mx:
        #         return key

        # test = {}
        # mx, res = 0, 0
        # for char in nums:
        #     if char not in test:
        #         test[char] = 1
        #     else:
        #         test[char] += 1
        #     if test[char] > mx:
        #         mx = test[char]
        #         res = char
        # return res

        res, count = 0, 0
        for n in nums:
            if count == 0:
                res = n
            if n == res:
                count += 1
            else:
                count -= 1
        return res




        # count = {}
        # res, maxCount = 0, 0
        # for n in nums:
```

```
        #     count[n] = 1 + count.get(n, 0)
        #     res = n if count[n] > maxCount else res
        #     maxCount = max(count[n], maxCount)
        # return res
```

21. Merge Two Sorted Lists

Example 1:	



```
# Definition for singly-linked list.
# class ListNode:
#     def __init__(self, val=0, next=None):
#         self.val = val
#         self.next = next
class Solution:
    def mergeTwoLists(self, list1: Optional[ListNode], list2: Optional[ListNode]) -> 
Optional[ListNode]:
        temp = current = ListNode(0)
        while list1 and list2:
            if list1.val < list2.val:
                current.next = list1
                list1 = list1.next
            else:
                current.next = list2
                list2 = list2.next
            current = current.next

        current.next = list1 or list2
        return temp.next
```

70. Climbing Stairs

Example 1:

Input: n = 2
Output: 2
Explanation: There are two ways to climb to the top.
1. 1 step + 1 step
2. 2 steps

Example 2:

Input: n = 3
Output: 3
Explanation: There are three ways to climb to the top.
1. 1 step + 1 step + 1 step
2. 1 step + 2 steps
3. 2 steps + 1 step

```
class Solution:
    def climbStairs(self, n: int) -> int:
        prev1 = 1
        prev2 = 2
        current = 0
        if n <= 2:
            return n
        else:
            for i in range(2, n):
                current = prev1 + prev2
                prev1 = prev2
                prev2 = current
            return current
```

350. Intersection of Two Arrays II

Example 1:

Input: nums1 = [1,2,2,1], nums2 = [2,2]
Output: [2,2]

Example 2:

Input: nums1 = [4,9,5], nums2 = [9,4,9,8,4]
Output: [4,9]

Explanation: [9,4] is also accepted.

```
class Solution:
    def intersect(self, nums1: List[int], nums2: List[int]) -> List[int]:
        #space - O(min(len(nums1), len(nums2)), Time - O(n + m)
        intersect = []
        test = {}
        #find the length of the shortest array and use that for
        #dictionary for least memory.
        for char in nums1:
            if char not in test:
                test[char] = 1
            else:
                test[char] += 1
        for n in nums2:
            if n in test:
                if test[n] > 0:
                    intersect.append(n)
                    test[n] -= 1
        return intersect

        #Time - nlogn + n = nlogn from sorting, space - O(1)
        # intersect = []
        # nums1.sort()
        # nums2.sort()
        # i,j = 0, 0
        # while i < len(nums1) and j < len(nums2):
        #     if nums1[i] < nums2[j]:
        #         i += 1
        #     elif nums2[j < nums1[i]]:
        #         j += 1
        #     else:
        #         intersect.append(nums1[i])
        #         i += 1
        #         j += 1
        # return intersect

        # Since nums2 is too big, it's stored on disc. We can still use the first
algo and build our hash map / dict and after that we can break nums2 into as small
chunks as possible and check if that belongs in hash map and append to our intersect
array/.
```

412. Fizz Buzz

Given an integer n, return *a string array* answer *(**1-indexed**) where*:

- answer[i] == "FizzBuzz" if i is divisible by 3 and 5.
- answer[i] == "Fizz" if i is divisible by 3.
- answer[i] == "Buzz" if i is divisible by 5.
- answer[i] == i (as a string) if none of the above conditions are true.

Example 1:

Input: n = 3
Output: ["1","2","Fizz"]

Example 2:

Input: n = 5
Output: ["1","2","Fizz","4","Buzz"]

```python
class Solution:
    def fizzBuzz(self, n: int) -> List[str]:
        s = []
        for i in range(1, n + 1):
            if i % 3 == 0 and i % 5 == 0:
                s.append("FizzBuzz")
            elif i % 3 == 0:
                s.append("Fizz")
            elif i % 5 == 0:
                s.append("Buzz")
            else:
                s.append(str(i))
        return s
```

326. Power of Three

Example 1:

Input: n = 27
Output: true
Explanation: $27 = 3^3$

Example 2:

Input: n = 0
Output: false
Explanation: There is no x where $3^x = 0$.

Example 3:

Input: n = -1
Output: false
Explanation: There is no x where 3^x = (-1).

```
class Solution:
    def isPowerOfThree(self, n: int) -> bool:
        # if n == 0:
        #     return False
        # res = 0
        # x = 0
        # while res < n:
        #     res = pow(3, x)
        #     if n == res:
        #         return True
        #     x += 1
        # return False

        while n >= 3:
            if n % 3 != 0:
                return False
            n /= 3
        return n == 1


        # x = 0
        # if n > 0:
        #     x = math.log3(n)
        # x = int(x)
        # print(isinstance(x, int))
        # return isinstance(x, int) and n > 0

        #return isinstance(math.log10(n) / math.log10(3), int) and n > 0
        if n > 0:
            return (math.log10(n) / math.log10(3)) % 1 == 0
```

171. Excel Sheet Column Number

For example:

A -> 1
B -> 2
C -> 3
...

Z -> 26
AA -> 27
AB -> 28
...

Example 1:

Input: columnTitle = "A"
Output: 1

Example 2:

Input: columnTitle = "AB"
Output: 28

```python
class Solution:
    def titleToNumber(self, columnTitle: str) -> int:
        column = 0

        for i in range(len(columnTitle)):
            value = ord(columnTitle[i]) - ord('A') + 1
            column += value * pow(26, len(columnTitle) - 1 - i)
        return column





        # column = 0
        # test = {'A' : 1, 'B' : 2, 'C' : 3,
        #         'D' : 4,
        #         'E' : 5,
        #         'F' : 6,
        #         'G' : 7,
        #         'H' : 8,
        #         'I' : 9,
        #         'J' : 10,
        #         'K' : 11,
        #         'L' : 12,
        #         'M' : 13,
        #         'N' : 14,
        #         'O' : 15,
        #         'P' : 16,
        #         'Q' : 17,
        #         'R' : 18,
        #         'S' : 19,
        #         'T' : 20,
        #         'U' : 21,
        #         'V' : 22,
        #         'W' : 23,
        #         'X' : 24,
        #         'Y' : 25,
        #         'Z' : 26

        #         }
        # for i in range(len(columnTitle)):
        #     column += test[columnTitle[i]] * pow(26, len(columnTitle) - i -1)
        # return column
```

344. Reverse String

Example 1:

Input: s = ["h","e","l","l","o"]
Output: ["o","l","l","e","h"]

```
class Solution:
    def reverseString(self, s: List[str]) -> None:
        """
        Do not return anything, modify s in-place instead.
        """
        l, r = 0, len(s) - 1
        while l < r:
            s[l], s[r] = s[r], s[l]
            l += 1
            r -= 1

        #recursion requires extra memory though cause of the call stack
        # def reverse(l, r):
        #     if l < r:
        #         s[l], s[r] = s[r], s[l]
        #         reverse(l + 1, r - 1)
        # reverse(0, len(s) - 1)



        #using stack, requires extra memory
        # stack = []
        # for char in s:
        #     stack.append(char)
        # for i in range(len(stack)):
        #     s[i] = stack.pop()


        # nums = []
        # for i in s[::-1]:
        #     nums.append(i)
        # s.clear()
        # #s = nums
        # for i in range(len(nums)):
        #     s.append(nums[i])
```

283. Move Zeroes

Example 1:

Input: nums = [0,1,0,3,12]
Output: [1,3,12,0,0]

Example 2:

Input: nums = [0]
Output: [0]

```
class Solution:
    def moveZeroes(self, nums: List[int]) -> None:
        """
        Do not return anything, modify nums in-place instead.
        """
        l = 0
        for i in range(len(nums)):
            if nums[i] != 0:
                # temp = nums[i]
                # nums[i] = nums[l]
                # nums[l] = temp
                nums[l], nums[i] = nums[i], nums[l]
                l += 1
```

387. First Unique Character in a String

Example 1:

Input: s = "leetcode"
Output: 0

Example 2:

Input: s = "loveleetcode"
Output: 2

Example 3:

Input: s = "aabb"
Output: -1

```
class Solution:
    def firstUniqChar(self, s: str) -> int:
        test = {}
        for char in s:
            if char not in test:
                test[char] = 1
            else:
                test[char] += 1

        for i in range(len(s)):
            if test[s[i]] == 1:
                return i
        return -1







        # test = {}
        # for char in s:
        #     if char not in test: #{'a' = 2, 'b' = 2}
        #         test[char] = 1
        #     else:
        #         test[char] += 1
        # found = False
        # for x, y in test.items():
        #     if y == 1:
        #         found = True
        #         z = x
        #         break
        # if found == False:
        #     return -1

        # for i in range(len(s)):
        #     if s[i] == z:
        #         return i
```

13. Roman to Integer

- I can be placed before V (5) and X (10) to make 4 and 9.
- X can be placed before L (50) and C (100) to make 40 and 90.
- C can be placed before D (500) and M (1000) to make 400 and 900.

Given a roman numeral, convert it to an integer.

Example 1:

Input: s = "III"
Output: 3
Explanation: III = 3.

Example 2:

Input: s = "LVIII"
Output: 58
Explanation: L = 50, V= 5, III = 3.

Example 3:

Input: s = "MCMXCIV"
Output: 1994
Explanation: M = 1000, CM = 900, XC = 90 and IV = 4.

```
class Solution:
    def romanToInt(self, s: str) -> int:
        romans = {
            'I' : 1,
            'V' : 5,
            'X' : 10,
            'L' : 50,
            'C' : 100,
            'D' : 500,
            'M' : 1000

        }
        numerals = 0
        # s = s.replace('IV', 'IIII')
        # s = s.replace('IX', 'VIIII')
        # s = s.replace('XL', 'XXXX')
        # s = s.replace('XC', 'LXXXX').replace('CD', 'CCCC').replace("CM", 'DCCCC')
        # for characters in s:
        #     numerals += romans[characters]
        # return numerals
        for i in range(len(s)):
            numerals += romans[s[i]]
        #l = len(s)
        for i in range(len(s) - 1):
            if romans[s[i]] < romans[s[i + 1]]:
                numerals -= romans[s[i]]
            else:
                numerals += romans[s[i]]
        return numerals + romans[s[-1]]
```

14. Longest Common Prefix

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.

```
class Solution:
    def longestCommonPrefix(self, strs: List[str]) -> str:
        # smax, smin = max(strs), min(strs)
        # i, match = 0, 0
        # while i < len(smin) and smax[i] == smin[i]:
        #     i += 1
        #     match += 1
        # return smin[0:match]

        # I think this is only checking the max and min strings, not optimum solution

        smin = min(strs, key = len)
        if smin == "":
            return ""
        for i in range(len(smin)):
            for others in strs:
                if others[i] != smin[i]:
                    return smin[:i]
        return smin
```

20. Valid Parentheses

Example 1:

Input: s = "()"
Output: true

Example 2:

Input: s = "()[]{}"
Output: true

Example 3:

Input: s = "(]"
Output: false

```
class Solution:
    def isValid(self, s: str) -> bool:

        stack = []
        for char in s:
            if char == '(':
                stack.append(')')
            elif char == '{':
                stack.append('}')
            elif char == '[':
                stack.append(']')
            elif char == ')' or char == '}' or char == ']':
                if stack == [] or stack.pop() != char:
                    return False
            # elif stack == [] or stack.pop() != char:
            #     return False
        return stack == []

        # stack = []
        # characters = {')' : '(', '}' : '{', ']' : '['}
        # for char in s:
        #     if char in characters.values():
        #         stack.append(char)
        #     elif char in characters.keys():
        #         if stack == [] or stack.pop() != characters[char]:
        #             return False
        # return stack == []









        # x1, y1, z1, x2, y2, z2 = 0, 0, 0, 0, 0, 0
        # for char in s:
        #     if char == '(':
        #         x1 += 1
        #     elif char == '{':
        #         y1 += 1
        #     elif char == '[':
        #         z1 += 1
        #     elif char == ')':
        #         x2 += 1
        #     elif char == '}':
        #         y2 += 1
        #     else:
        #         z2 += 1
        # if x1 == x2:
        #     if y1 == y2:
        #         if z1 == z2:
        #             return True
        # else:
        #     return False
```

22. Generate Parentheses (Medium)

Given n pairs of parentheses, write a function to *generate all combinations of well-formed parentheses*.

Example 1:

Input: n = 3
Output: ["((()))","(()())","(())()","()(())","()()()"]

Example 2:

Input: n = 1
Output: ["()"]

```
class Solution:
    def generateParenthesis(self, n: int) -> List[str]:
        stack = []
        res = []

        def backtrack(openN, closedN):
            if openN == closedN == n:
                res.append("".join(stack))
                return None

            if openN < n:
                stack.append("(")
                print("After appending", stack)
                backtrack(openN + 1, closedN)
                stack.pop()
                print("After pop", stack)

            if closedN < openN:
                stack.append(")")
                print("After appending", stack)
                backtrack(openN, closedN + 1)
                stack.pop()
                print("After pop", stack)
        backtrack(0, 0)
        return res
```