ASSIGNMENT-1

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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.

```
Output
main.py
                                                   6
                                                          Save
                                                                    Run
                                                                           [0, 1]
1 - def two_sum(nums, target):
for i, num in enumerate(nums):
                                                                           === Code Execution Successful ===
3 +
       complement = target - num
4
5 +
        if complement in num_dict:
6
         return [num_dict[complement], i]
7
        num_dict[num] = i
8
     return None
10 nums = [2, 7, 11, 15]
11 target = 9
12 print(two_sum(nums, target))
13
```

2. Add Two Numbers

You are given two non-empty linked lists representing two non-negative integers. The digits are stored in reverse order, and each of their nodes contains a single digit. Add the two numbers and return the sum as a linked list. You may assume the two numbers do not contain any leading zero, except the number 0 itself.

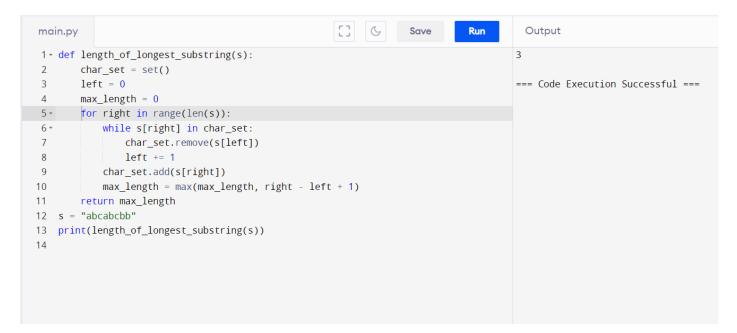
```
class ListNode:
  def __init__(self, val=0, next=None):
    self.val = val
    self.next = next
def addTwoNumbers(I1, I2):
  dummy = ListNode()
  current, carry = dummy, 0
  while I1 or I2 or carry:
    val1, val2 = (l1.val if l1 else 0), (l2.val if l2 else 0)
    carry, out = divmod(val1 + val2 + carry, 10)
    current.next = ListNode(out)
    current = current.next
    11, I2 = (I1.next if I1 else None), (I2.next if I2 else None)
  return dummy.next
def create_linked_list(lst):
  dummy = ListNode()
  current = dummy
  for number in lst:
    current.next = ListNode(number)
```

```
current = current.next
return dummy.next
def linked_list_to_list(node):
    result = []
    while node:
        result.append(node.val)
        node = node.next
    return result
l1 = create_linked_list([2, 4, 3])
l2 = create_linked_list([5, 6, 4])
result = addTwoNumbers(l1, l2)
print(linked_list_to_list(result))
```

```
[] 6
                                                                                   Output
main.py
                                                            Save
                                                                         Run
1 - class ListNode:
                                                                                 [7, 0, 8]
2 *
     def __init__(self, val=0, next=None):
          self.val = val
                                                                                 === Code Execution Successful ===
3
          self.next = next
5 - def addTwoNumbers(11, 12):
      dummy = ListNode()
      current, carry = dummy, 0
8 -
    while l1 or l2 or carry:
       val1, val2 = (l1.val if l1 else 0), (l2.val if l2 else 0)
9
          carry, out = divmod(val1 + val2 + carry, 10)
10
        current.next = ListNode(out)
11
12
       current = current.next
13
          11, 12 = (11.next if 11 else None), (12.next if 12 else None)
     return dummy.next
14
15 - def create_linked_list(lst):
16
     dummy = ListNode()
17
      current = dummy
18 ▼
       for number in 1st:
        current.next = ListNode(number)
    return dummy.next
20
         current = current.next
21
22 def linked_list_to_list(node):
23
     result = []
24 -
      while node:
```

3. Longest Substring without Repeating Characters

Given a string s, find the length of the longest substring without repeating characters.



4. Median of Two Sorted Arrays

Given two sorted arrays nums1 and nums2 of size m and n respectively, return the median of the two sorted arrays. The overall run time complexity should be O(log (m+n)).

```
Output
main.py
                                                             [] G Save
                                                                                   Run
 1 - def findMedianSortedArrays(nums1, nums2):
                                                                                            3
    if len(nums1) > len(nums2):
          nums1, nums2 = nums2, nums1
                                                                                            === Code Execution Successful ===
 3
 4
      m, n = len(nums1), len(nums2)
      half_len = (m + n + 1) // 2
 6
      imin. imax = 0. m
       while imin <= imax:
 7 -
         i = (imin + imax) // 2
 8
 9
           j = half_len - i
10 -
          if i < m and nums1[i] < nums2[j-1]:</pre>
11
              imin = i + 1
           elif i > 0 and nums1[i-1] > nums2[j]:
13 imax = i - 1
    else:
14 -
              if i == 0: max_of_left = nums2[j-1]
15
             elif j == 0: max_of_left = nums1[i-1]
17
              else: max_of_left = max(nums1[i-1], nums2[j-1])
18 -
               if (m + n) % 2 == 1:
                  return max_of_left
              if i == m: min of right = nums2[j]
20
21
              elif j == n: min_of_right = nums1[i]
              else: min_of_right = min(nums1[i], nums2[j])
22
               return (max_of_left + min_of_right) / 2.0
23
24 \quad nums1 = [1, 3]
25 \quad nums2 = [2]
   print(findMedianSortedArrays(nums1, nums2))
27
```

5. Longest Palindromic Substring

Given a string s, return the longest palindromic substring in s.

```
Output
 1 - def longest_palindromic_substring(s):
                                                                                    bab
       if len(s) == 0:
         return ""
3
                                                                                    === Code Execution Successful ===
     def expand_around_center(s, left, right):
 5 +
         while left >= 0 and right < len(s) and s[left] == s[right]:</pre>
 6
             left -= 1
 7
              right += 1
 8
          return left + 1, right - 1
9
      start, end = 0, 0
     for i in range(len(s)):
10 -
11
         left1, right1 = expand_around_center(s, i, i)
12
         left2, right2 = expand_around_center(s, i, i + 1)
13 -
         if right1 - left1 > end - start:
              start, end = left1, right1
14
15 -
           if right2 - left2 > end - start:
              start, end = left2, right2
16
17
     return s[start:end + 1]
18 s = "babad"
19 print(longest_palindromic_substring(s))
20
```

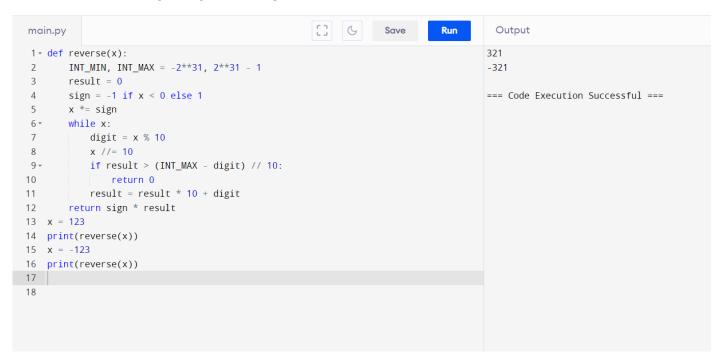
6. Zigzag Conversion

The string "PAYPALISHIRING" is written in a zigzag pattern on a given number of rows like this: (you may want to display this pattern in a fixed font for better legibility) P A H N A P L S I I G Y I R And then read line by line: "PAHNAPLSIIGYIR" Write the code that will take a string and make this conversion given a number of rows: string convert(string s, int numRows);

```
[] G Save
main.py
                                                                                   Output
1 - def convert(s, numRows):
                                                                                 PAHNAPLSIIGYIR
2 -
       if numRows == 1 or numRows >= len(s):
          return s
                                                                                  === Code Execution Successful ===
3
     rows = [''] * numRows
5
6
     current_row, step = 0, -1
8 +
     for char in s:
9
         rows[current_row] += char
10 -
         if current_row == 0 or current_row == numRows - 1:
             step = -step
11
12
          current_row += step
13
       return ''.join(rows)
14
15
16 s = "PAYPALISHIRING"
17 \quad numRows = 3
18 print(convert(s, numRows))
19
```

7. 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 [-231, 231 - 1], then return 0. Assume the environment does not allow you to store 64-bit integers (signed or unsigned).



8. String to Integer

Implement the myAtoi(string s) function, which converts a string to a 32-bit signed integer

```
[] Save
                                                                                     Output
main.py
 1 - def myAtoi(s):
                                                                                    42
       INT_MIN, INT_MAX = -2**31, 2**31 - 1
                                                                                    -42
       i, n = 0, len(s)
                                                                                    4193
4 -
       while i < n and s[i].isspace():</pre>
          i += 1
                                                                                    === Code Execution Successful ===
 5
       sign = 1
6
7 +
     if i < n and s[i] in ('+', '-'):
         sign = -1 if s[i] == '-' else 1
i += 1
8
9
10
      result = 0
11 -
     while i < n and s[i].isdigit():</pre>
12
          digit = int(s[i])
          if result > (INT_MAX - digit) // 10:
13 +
14
            return INT_MAX if sign == 1 else INT_MIN
15
           result = result * 10 + digit
16
           i += 1
       return sign * result
17
18 print(myAtoi("42"))
19 print(myAtoi(" -42"))
20 print(myAtoi("4193 with words"))
21
```

9. Palindrome Number

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



10. Regular Expression Matching

Given an input string s and a pattern p, implement regular expression matching with support for '.' and '*' where: ● '.' Matches any single character. ● '*' Matches zero or more of the preceding element. The matching should cover the entire input string (not partial).

```
[] Save
                                                                                     Output
main.py
                                                                          Run
 1 - def isMatch(s, p):
                                                                                    False
2 m, n = len(s), len(p)
                                                                                    True
       dp = [[False] * (n + 1) for _ in range(m + 1)]
                                                                                    True
3
4
       dp[0][0] = True
                                                                                    === Code Execution Successful ===
       for j in range(1, n + 1):
          if p[j - 1] == '*'
6 =
               dp[0][j] = dp[0][j - 2]
7
 8 +
       for i in range(1, m + 1):
9 +
         for j in range(1, n + 1):
              if p[j - 1] == '*':
10 -
                   dp[i][j] = dp[i][j - 2]
11
                   if p[j - 2] == '.' or p[j - 2] == s[i - 1]:
12 -
13
                       dp[i][j] = dp[i][j] or dp[i - 1][j]
14 -
15 +
                   if p[j - 1] == '.' or p[j - 1] == s[i - 1]:
16
                       dp[i][j] = dp[i - 1][j - 1]
       return dp[m][n]
17
18 print(isMatch("aa", "a"))
19 print(isMatch("aa", "a*"))
20 print(isMatch("ab", ".*"))
21
22
```