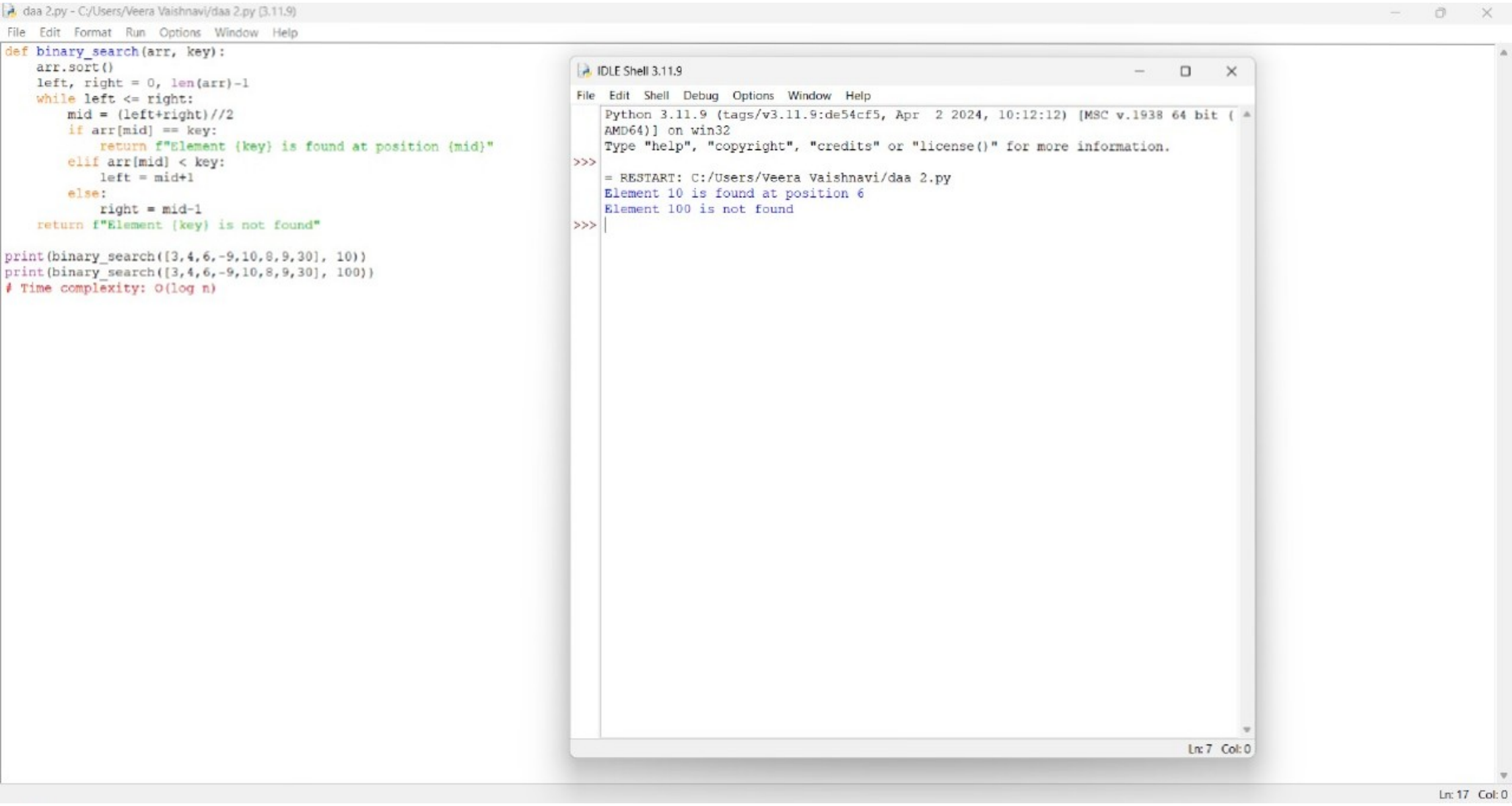

daa 2.py - C:/Users/Veera Vaishnavi/daa 2.py (3.11.9)
File Edit Format Run Options Window Help
def binary_search(arr, key):
arr.sort()
left, right = 0, len(arr)-1
while left <= right:
mid = (left+right)//2
if arr[mid] == key:
return f"Element {key} is found at position {mid}"
elif arr[mid] < key:
left = mid+1
else:
right = mid-1
return f"Element {key} is not found"
print(binary_search([3,4,6,-9,10,8,9,30], 10))
print(binary_search([3,4,6,-9,10,8,9,30], 100))
# Time complexity: O(log n)
IDLE Shell 3.11.9
File Edit Shell Debug Options Window Help
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr 2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
Element 10 is found at position 6
Element 100 is not found
>>>
Ln: 7 Col: 0
Ln: 17 Col: 0

File Edit Format Run Options Window Help

```
def climb_stairs(n):
    a = b = 1
    for _ in range(n-1):
        a, b = b, a+b
    return b

print(climb_stairs(4))  # 5
print(climb_stairs(3))  # 3
```

IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
5
3
>>>
```

Ln: 7 Col: 0

Ln: 9 Col: 0

File Edit Format Run Options Window Help

```
def find_ways(m, n, N, i, j):
    from functools import lru_cache
    @lru_cache(None)
    def dp(x, y, steps):
        if x<0 or x>=m or y<0 or y>=n:
            return 1
        if steps==0:
            return 0
        return dp(x+1,y,steps-1)+dp(x-1,y,steps-1)+dp(x,y+1,steps-1)+dp(x,y-1,steps-1)
    return dp(i,j,N)

print(find_ways(2,2,2,0,0))  # 6
print(find_ways(1,3,3,0,1))  # 12
```

IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
6
12
>>>
```

Ln: 7 Col: 0

Ln: 14 Col: 0

File Edit Format Run Options Window Help

```
def merge_sort(arr):
    if len(arr) <= 1:
        return arr
    mid = len(arr)//2
    left = merge_sort(arr[:mid])
    right = merge_sort(arr[mid:])
    result = []
    i = j = 0
    while i < len(left) and j < len(right):
        if left[i] < right[j]:
            result.append(left[i])
            i += 1
        else:
            result.append(right[j])
            j += 1
    result.extend(left[i:])
    result.extend(right[j:])
    return result

print(merge_sort([5,2,9,1,5,6]))
```

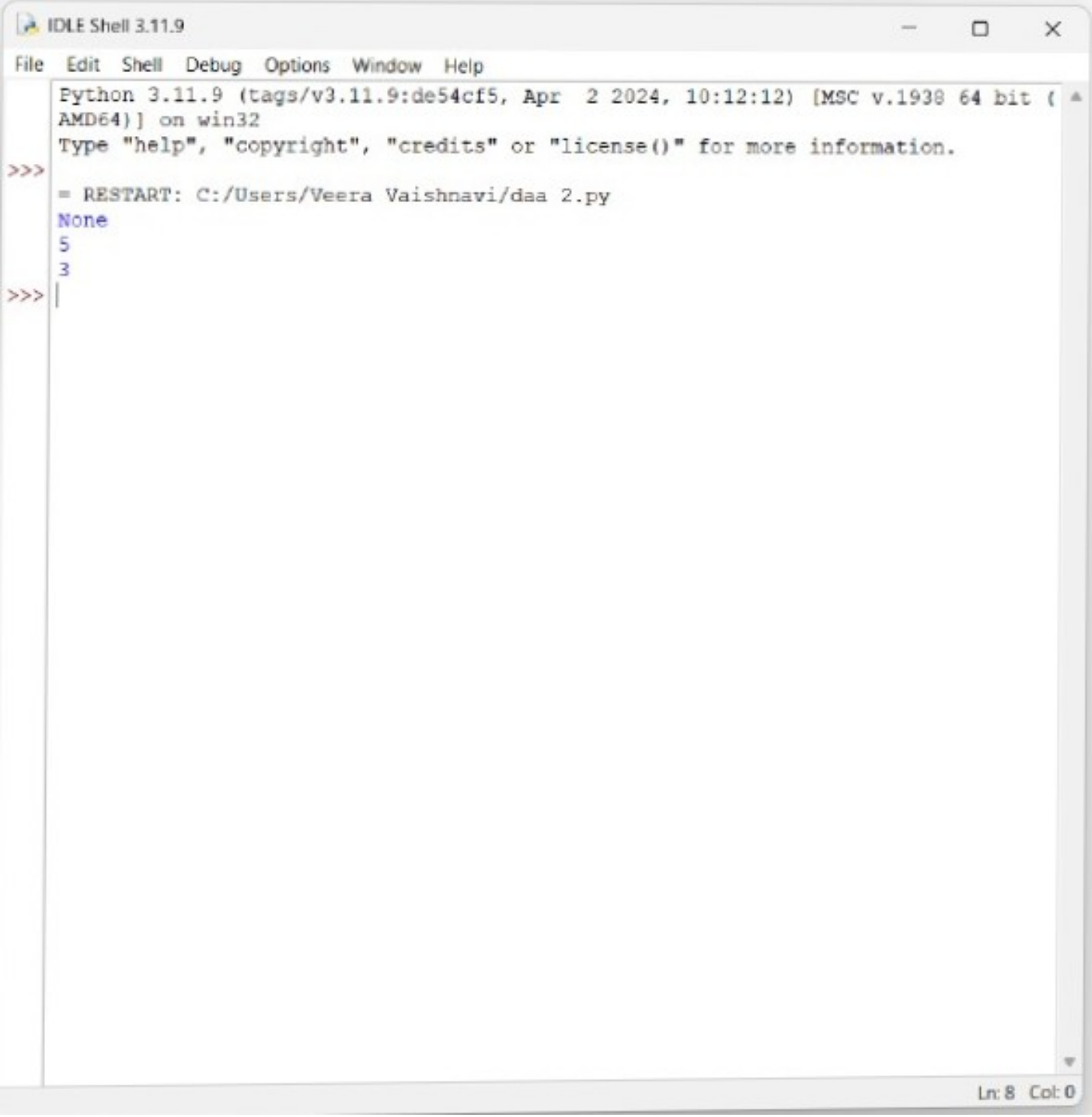
IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
[1, 2, 5, 5, 6, 9]
>>>
```

Ln: 6 Col: 0

Ln: 21 Col: 0


IDLE Shell 3.11.9
File Edit Shell Debug Options Window Help
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr 2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
None
5
3
>>>
Ln: 8 Col: 0

daa 2.py - C:/Users/Veera Vaishnavi/daa 2.py (3.11.9)

File Edit Format Run Options Window Help

```
def unique_elements(nums):
    seen = set()
    unique = []
    for num in nums:
        if num not in seen:
            seen.add(num)
            unique.append(num)
    return unique

print(unique_elements([3,7,3,5,2,5,9,2]))
print(unique_elements([-1,2,-1,3,2,-2]))
print(unique_elements([1000000,999999,1000000]))
# Space complexity: O(n)
```

Ln: 14 Col: 0

IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

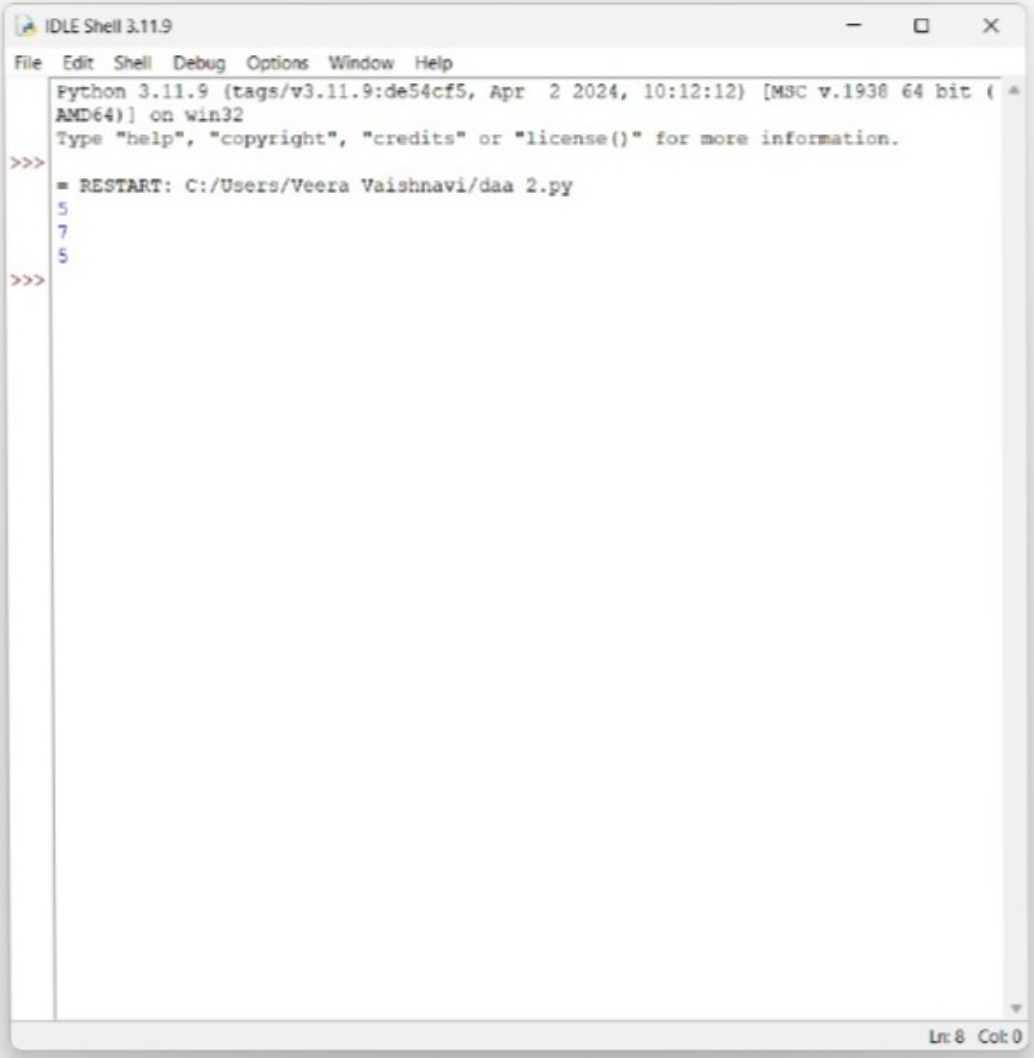
```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
[3, 7, 5, 2, 9]
[-1, 2, 3, -2]
[1000000, 999999]
>>>
```

Ln: 8 Col: 0

File Edit Format Run Options Window Help

```
def findMax(nums):
    return max(nums)

print(findMax([1, 2, 3, 4, 5]))      # Output: 5
print(findMax([7, 7, 7, 7, 7]))      # Output: 7
print(findMax([-10, 2, 3, -4, 5]))   # Output: 5
```



Ln: 7 Col: 0

File Edit Format Run Options Window Help

```
def bubble_sort(arr):
    n = len(arr)
    for i in range(n):
        for j in range(0, n-i-1):
            if arr[j] > arr[j+1]:
                arr[j], arr[j+1] = arr[j+1], arr[j]
    return arr

# Time complexity: O(n^2)
print(bubble_sort([5,1,4,2,8]))
```

IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
[1, 2, 4, 5, 8]
>>>
```

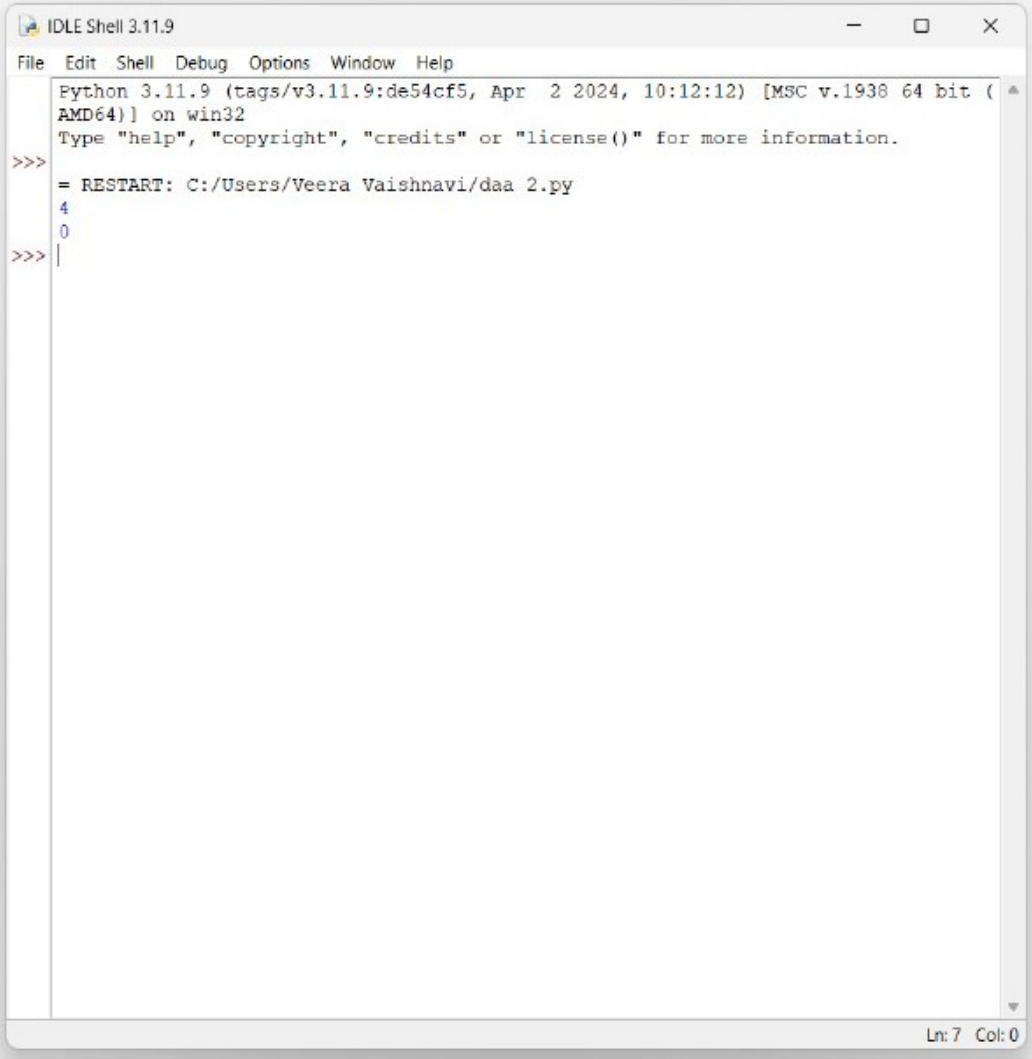
Ln: 6 Col: 0

Ln: 11 Col: 0

File Edit Format Run Options Window Help

```python
def countPairs(nums, k):
    n = len(nums)
    count = 0
    for i in range(n):
        for j in range(i+1, n):
            if nums[i] == nums[j] and (i * j) % k == 0:
                count += 1
    return count

print(countPairs([3,1,2,2,2,1,3], 2))  # Output: 4
print(countPairs([1,2,3,4], 1))        # Output: 0
```



Ln: 12 Col: 0

File Edit Format Run Options Window Help

```python
def sumOfSquares(nums):
    n = len(nums)
    total = 0
    for i in range(n):
        seen = set()
        for j in range(i, n):
            seen.add(nums[j])
            total += len(seen) ** 2
    return total

print(sumOfSquares([1,2,1]))  # Output: 15
print(sumOfSquares([1,1]))    # Output: 3
```

Ln: 1 Col: 1

IDLE Shell 3.11.9

File Edit Shell Debug Options Window Help

```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Veera Vaishnavi/daa 2.py
15
3
>>>
```

Ln: 7 Col: 0