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ROLL NUMBER: 546

COURSE: MSc CS

SUBJECT: ALGORITHM

TOPIC: RADIX SORT ALGORITHM

PRACTICAL 3

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# Python program for implementation of Radix Sort

# A function to do counting sort of arr[] according to
# the digit represented by exp.
def countingSort(arr, exp1):

    n = len(arr)

    # The output array elements that will have sorted arr
    output = [0] * (n)

    # initialize count array as 0
    count = [0] * (10)

    # Store count of occurrences in count[]
    for i in range(0, n):
        index = (arr[i]/exp1)
        count[int((index)%10)] += 1

    # Change count[i] so that count[i] now contains actual
    # position of this digit in output array
    for i in range(1,10):
        count[i] += count[i-1]

    # Build the output array
    i = n-1
    while i>=0:
        index = (arr[i]/exp1)
        output[ count[ int((index)%10) ] - 1] = arr[i]
        count[int((index)%10)] -= 1
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            i -= 1

        # Copying the output array to arr[],
        # so that arr now contains sorted numbers
        i = 0
        for i in range(0,len(arr)):
            arr[i] = output[i]

# Method to do Radix Sort
def radixSort(arr):

        # Find the maximum number to know number of digits
        max1 = max(arr)

        # Do counting sort for every digit. Note that instead
        # of passing digit number, exp is passed. exp is 10^i
        # where i is current digit number
        exp = 1
        while max1/exp > 0:
            countingSort(arr,exp)
            exp *= 10

# Driver code to test above
arr = [ 170, 45, 75, 90, 802, 24, 2, 66]
radixSort(arr)

for i in range(len(arr)):
        print(arr[i],end=" ")

# This code is contributed by Mohit Kumra
# This code is updated by Sudeep Saxena(saxenasudeepcse@gmail.com) on July 9, 2020
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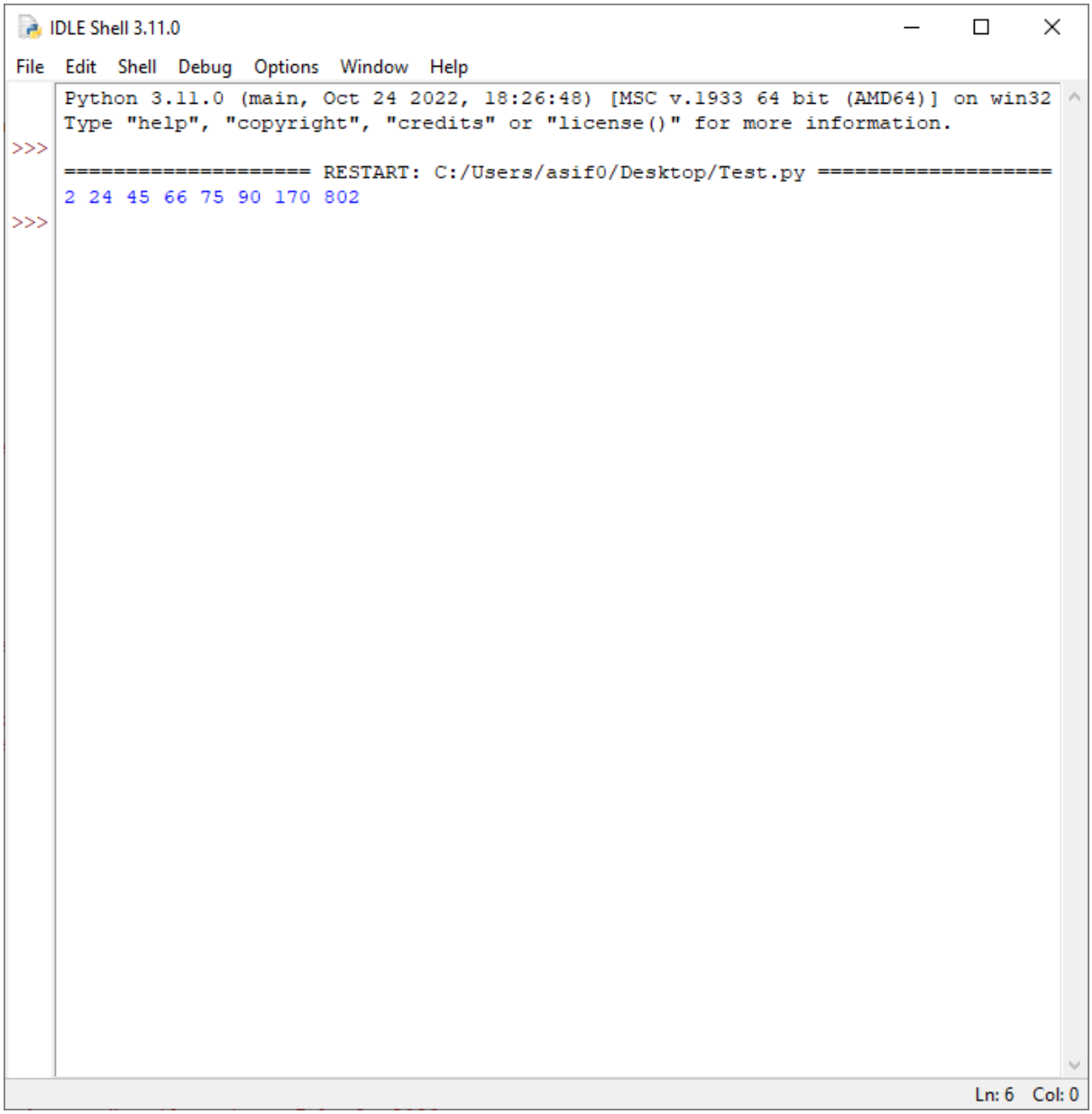
OUTPUT:


IDLE Shell 3.11.0
File Edit Shell Debug Options Window Help
Python 3.11.0 (main, Oct 24 2022, 18:26:48) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: C:/Users/asif0/Desktop/Test.py ==========
2 24 45 66 75 90 170 802
>>>
Ln: 6 Col: 0