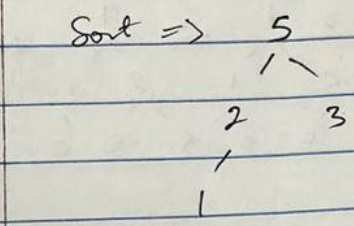
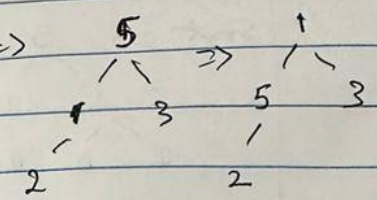
Heap Sort

① 5 2 3 1

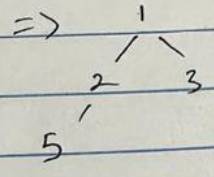
Sort =>



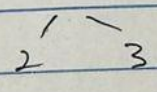
min heap =>



=>

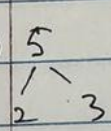


swap + extract =>

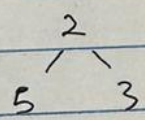


=> 1

b)



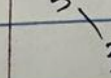
min heap =>



swap + extract =>

=> 1, 2

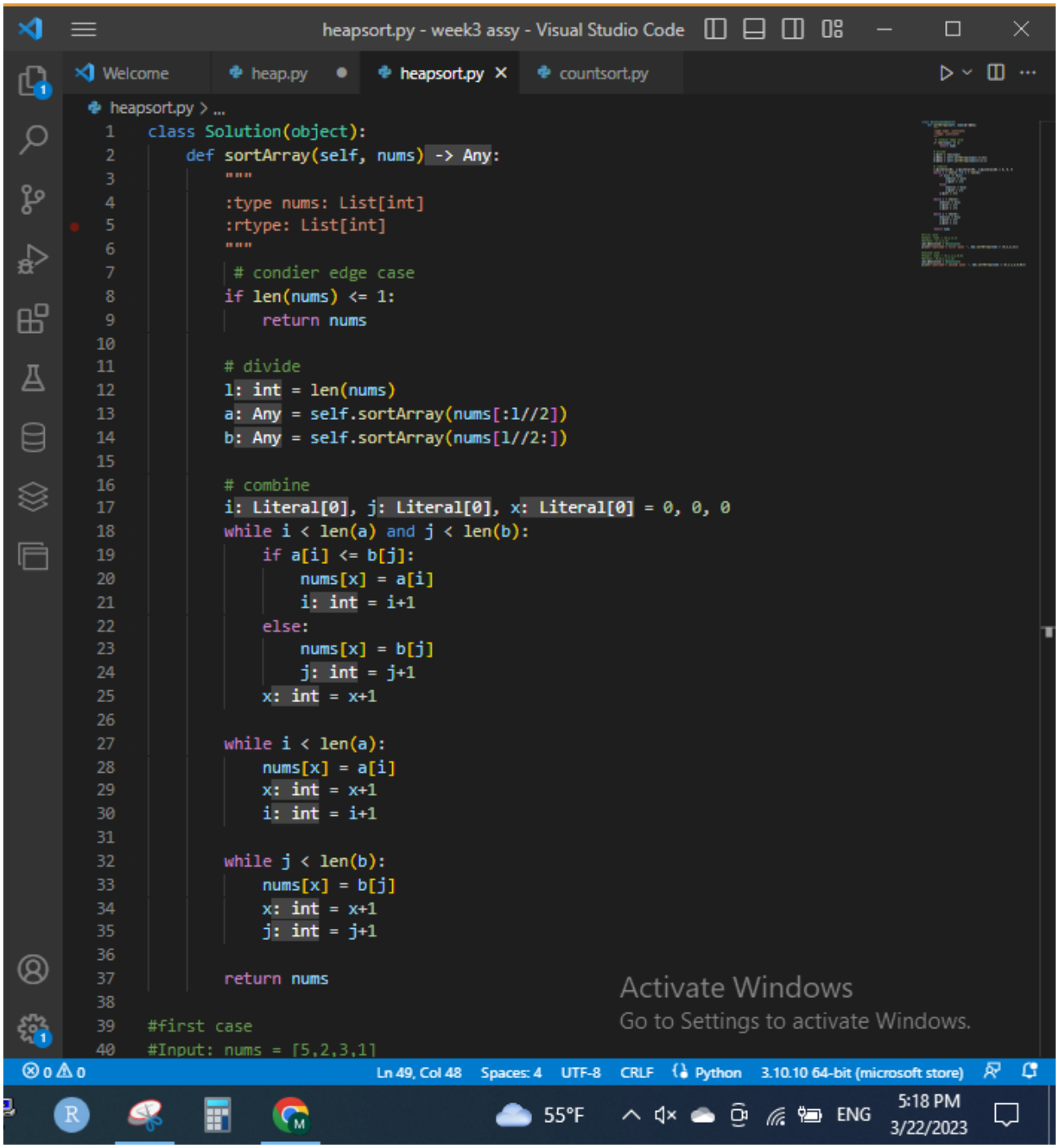
c)

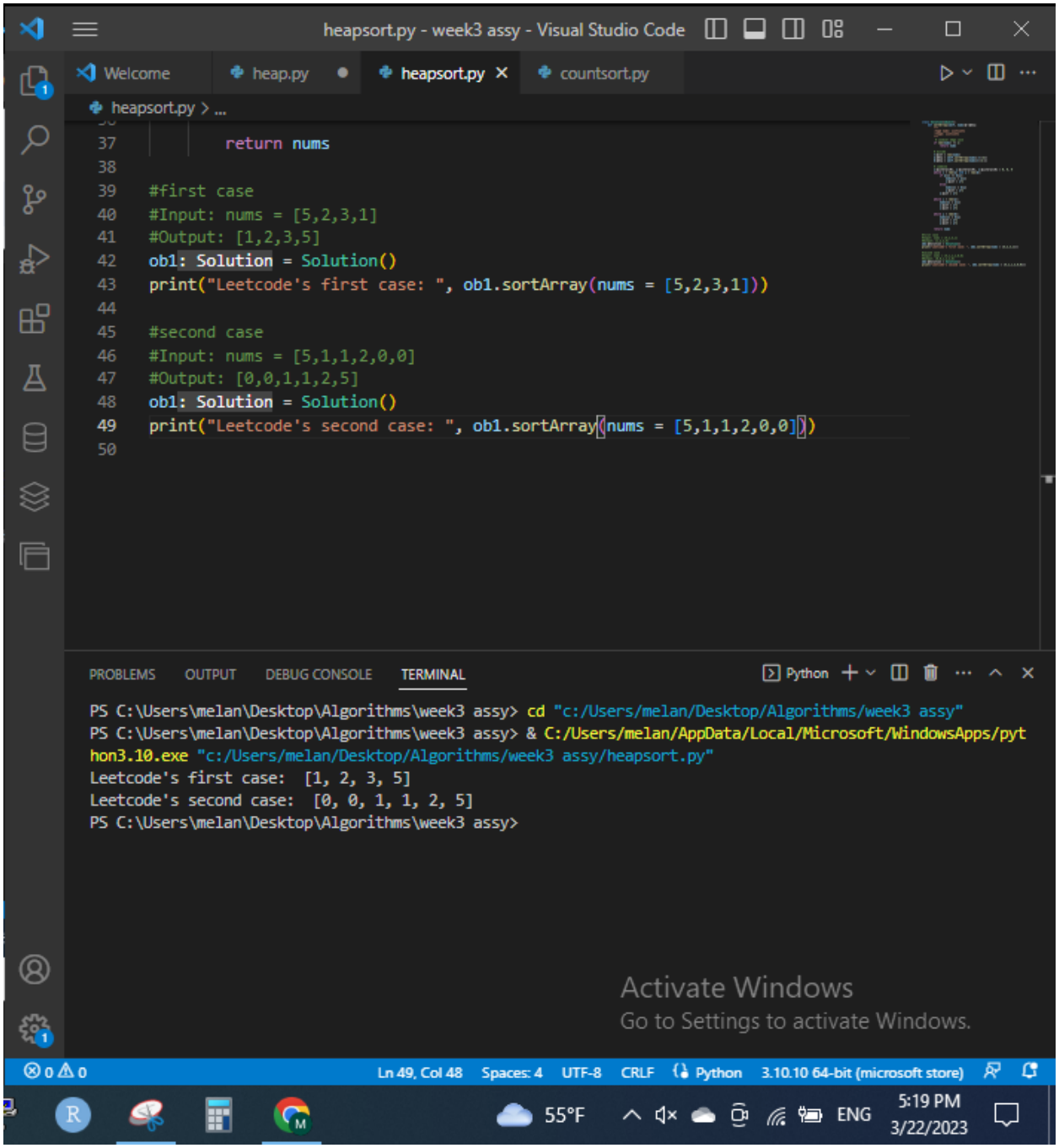


min heap =>

swap + extract => 5 => 1, 2, 3

d) => 1, 2, 3, 5


heapsort.py - week3 assy - Visual Studio Code
Welcome
heap.py
heapsort.py
countsort.py
heapsort.py > ...
class Solution(object):
def sortArray(self, nums) -> Any:
"""
:type nums: List[int]
:rtype: List[int]
"""
# condier edge case
if len(nums) <= 1:
return nums
divide
l: int = len(nums)
a: Any = self.sortArray(nums[:l//2])
b: Any = self.sortArray(nums[l//2:])
combine
i: Literal[0], j: Literal[0], x: Literal[0] = 0, 0, 0
while i < len(a) and j < len(b):
if a[i] <= b[j]:
nums[x] = a[i]
i: int = i+1
else:
nums[x] = b[j]
j: int = j+1
x: int = x+1
while i < len(a):
nums[x] = a[i]
x: int = x+1
i: int = i+1
while j < len(b):
nums[x] = b[j]
x: int = x+1
j: int = j+1
return nums
#first case
#Input: nums = [5,2,3,1]
Activate Windows
Go to Settings to activate Windows.
Ln 49, Col 48
Spaces: 4
UTF-8
CRLF
Python
3.10.10 64-bit (microsoft store)
55°F
ENG
5:18 PM
3/22/2023


heapsort.py - week3 assy - Visual Studio Code
Welcome
heap.py
heapsort.py
countsort.py
heapsort.py > ...
return nums
#first case
#Input: nums = [5,2,3,1]
#Output: [1,2,3,5]
ob1: Solution = Solution()
print("Leetcode's first case: ", ob1.sortArray(nums = [5,2,3,1]))
#second case
#Input: nums = [5,1,1,2,0,0]
#Output: [0,0,1,1,2,5]
ob1: Solution = Solution()
print("Leetcode's second case: ", ob1.sortArray(nums = [5,1,1,2,0,0]))
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
Python
PS C:\Users\melan\Desktop\Algorithms\week3 assy> cd "c:/Users/melan/Desktop/Algorithms/week3 assy"
PS C:\Users\melan\Desktop\Algorithms\week3 assy> & C:/Users/melan/AppData/Local/Microsoft/WindowsApps/python3.10.exe "c:/Users/melan/Desktop/Algorithms/week3 assy/heapsort.py"
Leetcode's first case: [1, 2, 3, 5]
Leetcode's second case: [0, 0, 1, 1, 2, 5]
PS C:\Users\melan\Desktop\Algorithms\week3 assy>
Activate Windows
Go to Settings to activate Windows.
Ln 49, Col 48
Spaces: 4
UTF-8
CRLF
Python
3.10.10 64-bit (microsoft store)
55°F
ENG
5:19 PM
3/22/2023

CODE

```
class Solution(object):
    def sortArray(self, nums):
        """
        :type nums: List[int]
        :rtype: List[int]
        """
         # condier edge case
        if len(nums) <= 1:
            return nums

        # divide
        l = len(nums)
        a = self.sortArray(nums[:l//2])
        b = self.sortArray(nums[l//2:])

        # combine
        i, j, x = 0, 0, 0
        while i < len(a) and j < len(b):
            if a[i] <= b[j]:
                nums[x] = a[i]
                i = i+1
            else:
                nums[x] = b[j]
                j = j+1
            x = x+1

        while i < len(a):
            nums[x] = a[i]
            x = x+1
            i = i+1

        while j < len(b):
            nums[x] = b[j]
            x = x+1
            j = j+1

        return nums

#first case
#Input: nums = [5,2,3,1]
#Output: [1,2,3,5]
ob1 = Solution()
```

```
print("Leetcode's first case: ", ob1.sortArray(nums = [5,2,3,1]))

#second case
#Input: nums = [5,1,1,2,0,0]
#Output: [0,0,1,1,2,5]
ob1 = Solution()
print("Leetcode's second case: ", ob1.sortArray(nums = [5,1,1,2,0,0]))
```