Worksheet – 3.1

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Branch: BE-CSE (LEET) **Section/Group:** 809/A
Semester: 4th **Date of Performance:** 20/04/2022
Subject Name: Programming in Python Lab **Subject Code:** 20CSP-259

1. Aim/Overview of the practical:

I. Python program to implement linear search.
II. Python program to implement bubble sort.
III. Python program to implement binary search without recursion.
IV. Python program to implement selection sort.

2. Task to be done/ Which logistics used:

I. Write a Python program to implement linear search.
II. Write a Python program to implement bubble sort.
III. Write a Python program to implement binary search without recursion.
IV. Write a Python program to implement selection sort.

3. Steps for experiment/practical/Code:

I. Write a Python program to implement linear search.

Source Code:

```
def linear_Search(list1, n, key):
    for i in range(0, n):
        if (list1[i] == key):
            return i
    return -1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0,n):
    ele=int(input())
    list1.append(ele)
key = int(input('Enter the Key to be Searched: '))
res = linear_Search(list1, n, key)
if(res == -1):
    print("Element {} not found in the list".format(key))
else:
    print("Element {} found at index position {}: ".format(key,res))
```

II. Write a Python program to implement bubble sort.

Source Code:

```
def bubble_sort(list1,n):
    for i in range(0,n-1):
        for j in range(n-1):
            if(list1[j]>list1[j+1]):
                temp = list1[j]
                list1[j] = list1[j+1]
                list1[j+1] = temp
    return list1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)
print("The Given Unsorted list is: ", list1)
print("The Sorted list is: ", bubble_sort(list1,n))
```

III. Write a Python program to implement binary search without recursion.

Source Code:

```
def binary_search(list1, key):
    low = 0
    high = len(list1) - 1
    mid = 0
    while low <= high:
        mid = (high + low) // 2
        if list1[mid] < key:
            low = mid + 1
        elif list1[mid] > key:
            high = mid - 1
        else:
            return mid
    return -1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)
key = int(input('Enter the Key to be Searched: '))
res = binary_search(list1, key)
if(res == -1):
    print("Element {} not found in the list".format(key))
else:
    print("Element {} found at index position {}: ".format(key, res))
```

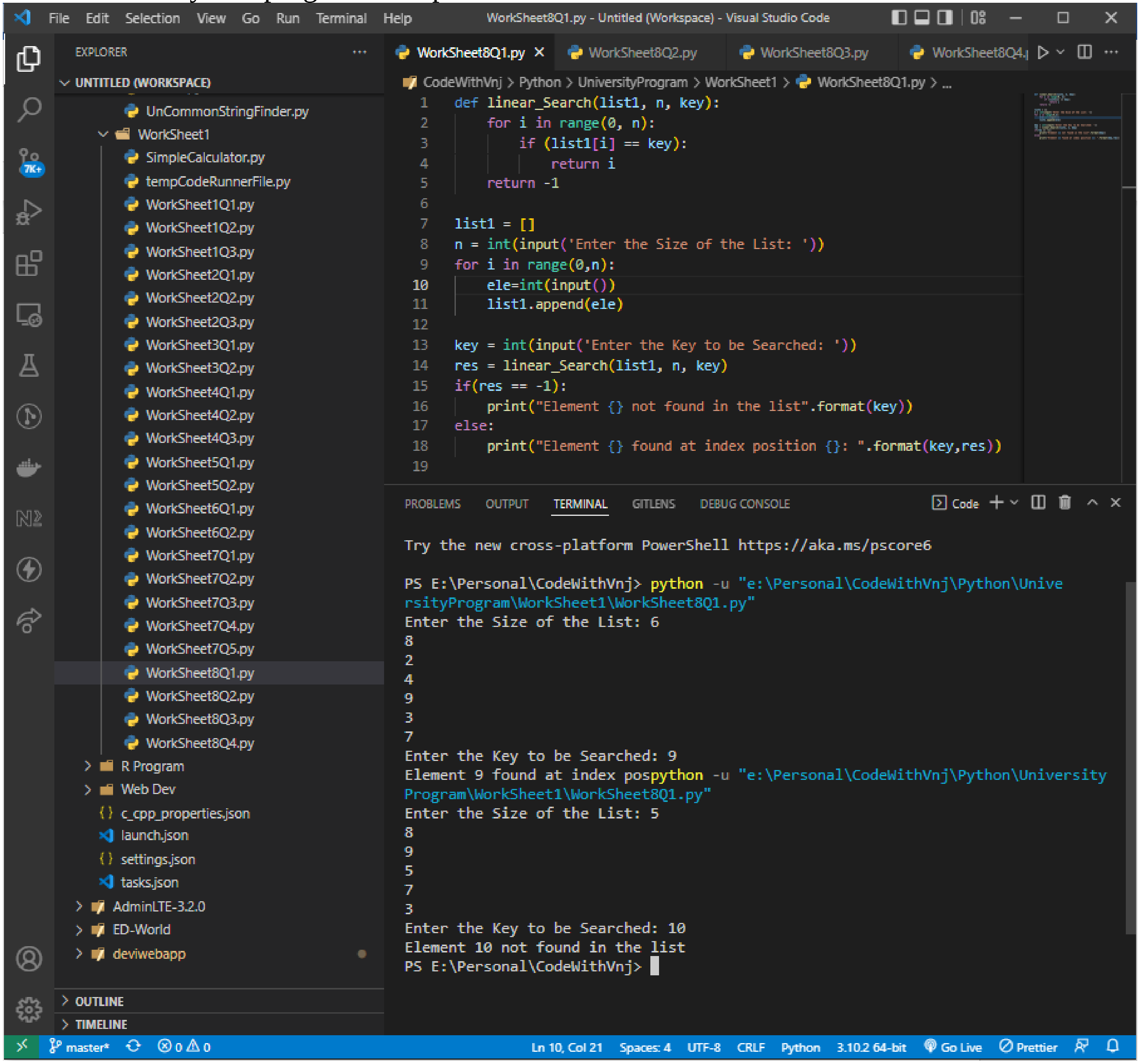
IV. Write a Python program to implement selection sort.

Source Code:

```
def selectionSort(array):
  n = len(array)
  for i in range(n):
    minimum = i
    for j in range(i+1, n):
      if (array[j] < array[minimum]):
        minimum = j
    temp = array[i]
    array[i] = array[minimum]
    array[minimum] = temp
  return array

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)
print("The Given Unsorted list is: ", list1)
print("The Sorted list is: ", selectionSort(list1))
```

4. Result/Output/Writing Summary:

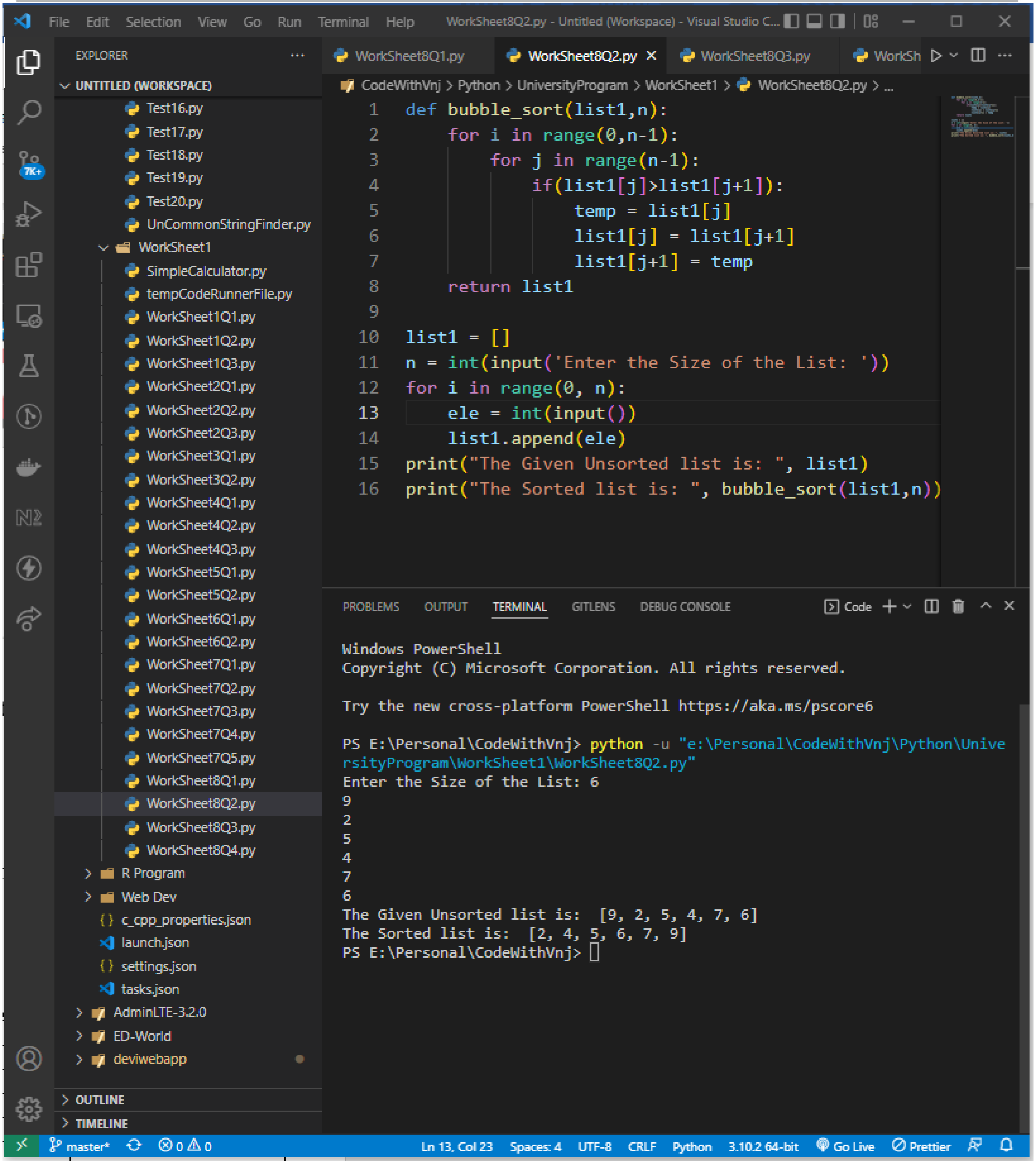
I. Write a Python program to implement linear search.



```
def linear_Search(list1, n, key):
    for i in range(0, n):
        if (list1[i] == key):
            return i
    return -1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0,n):
    ele=int(input())
    list1.append(ele)

key = int(input('Enter the Key to be Searched: '))
res = linear_Search(list1, n, key)
if(res == -1):
    print("Element {} not found in the list".format(key))
else:
    print("Element {} found at index position {}: ".format(key,res))
```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\Personal\CodeWithVnj> python -u "e:\Personal\CodeWithVnj\Python\Unive
rsityProgram\WorkSheet1\WorkSheet8Q1.py"
Enter the Size of the List: 6
8
2
4
9
3
7
Enter the Key to be Searched: 9
Element 9 found at index pospython -u "e:\Personal\CodeWithVnj\Python\University
Program\WorkSheet1\WorkSheet8Q1.py"
Enter the Size of the List: 5
8
9
5
7
3
Enter the Key to be Searched: 10
Element 10 not found in the list
PS E:\Personal\CodeWithVnj>
```

II. Write a Python program to implement bubble sort.



```python
def bubble_sort(list1,n):
    for i in range(0,n-1):
        for j in range(n-1):
            if(list1[j]>list1[j+1]):
                temp = list1[j]
                list1[j] = list1[j+1]
                list1[j+1] = temp
    return list1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)
print("The Given Unsorted list is: ", list1)
print("The Sorted list is: ", bubble_sort(list1,n))
```

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\Personal\CodeWithVnj> python -u "e:\Personal\CodeWithVnj\Python\Unive
rsityProgram\WorkSheet1\WorkSheet8Q2.py"
Enter the Size of the List: 6
9
2
5
4
7
6
The Given Unsorted list is:  [9, 2, 5, 4, 7, 6]
The Sorted list is:  [2, 4, 5, 6, 7, 9]
PS E:\Personal\CodeWithVnj> 
```
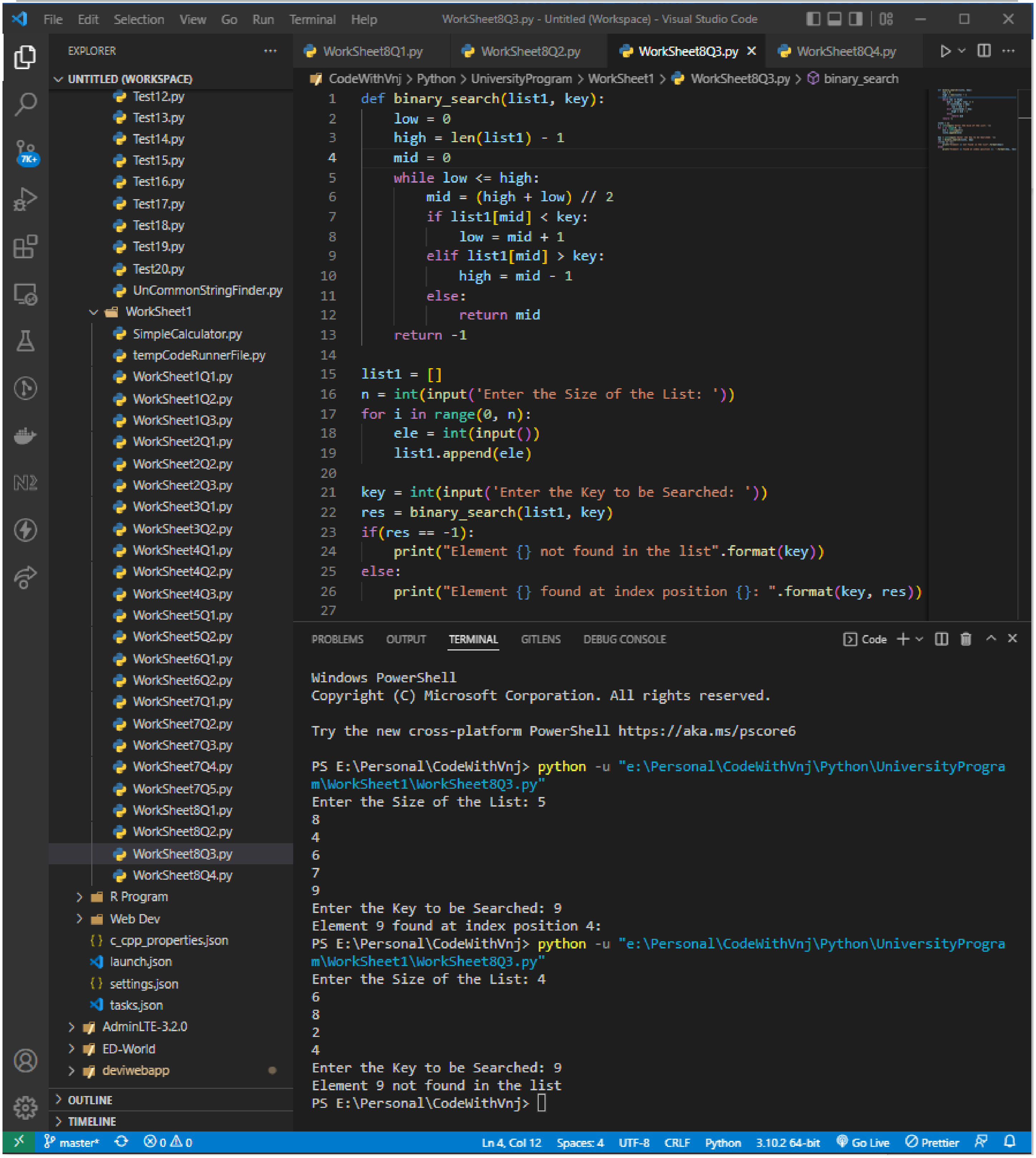

III. Write a Python program to implement binary search without recursion.



```python
def binary_search(list1, key):
    low = 0
    high = len(list1) - 1
    mid = 0
    while low <= high:
        mid = (high + low) // 2
        if list1[mid] < key:
            low = mid + 1
        elif list1[mid] > key:
            high = mid - 1
        else:
            return mid
    return -1

list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)

key = int(input('Enter the Key to be Searched: '))
res = binary_search(list1, key)
if(res == -1):
    print("Element {} not found in the list".format(key))
else:
    print("Element {} found at index position {}: ".format(key, res))
```

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\Personal\CodeWithVnj> python -u "e:\Personal\CodeWithVnj\Python\UniversityProgra
m\WorkSheet1\WorkSheet8Q3.py"
Enter the Size of the List: 5
8
4
6
7
9
Enter the Key to be Searched: 9
Element 9 found at index position 4:
PS E:\Personal\CodeWithVnj> python -u "e:\Personal\CodeWithVnj\Python\UniversityProgra
m\WorkSheet1\WorkSheet8Q3.py"
Enter the Size of the List: 4
6
8
2
4
Enter the Key to be Searched: 9
Element 9 not found in the list
PS E:\Personal\CodeWithVnj> 
```
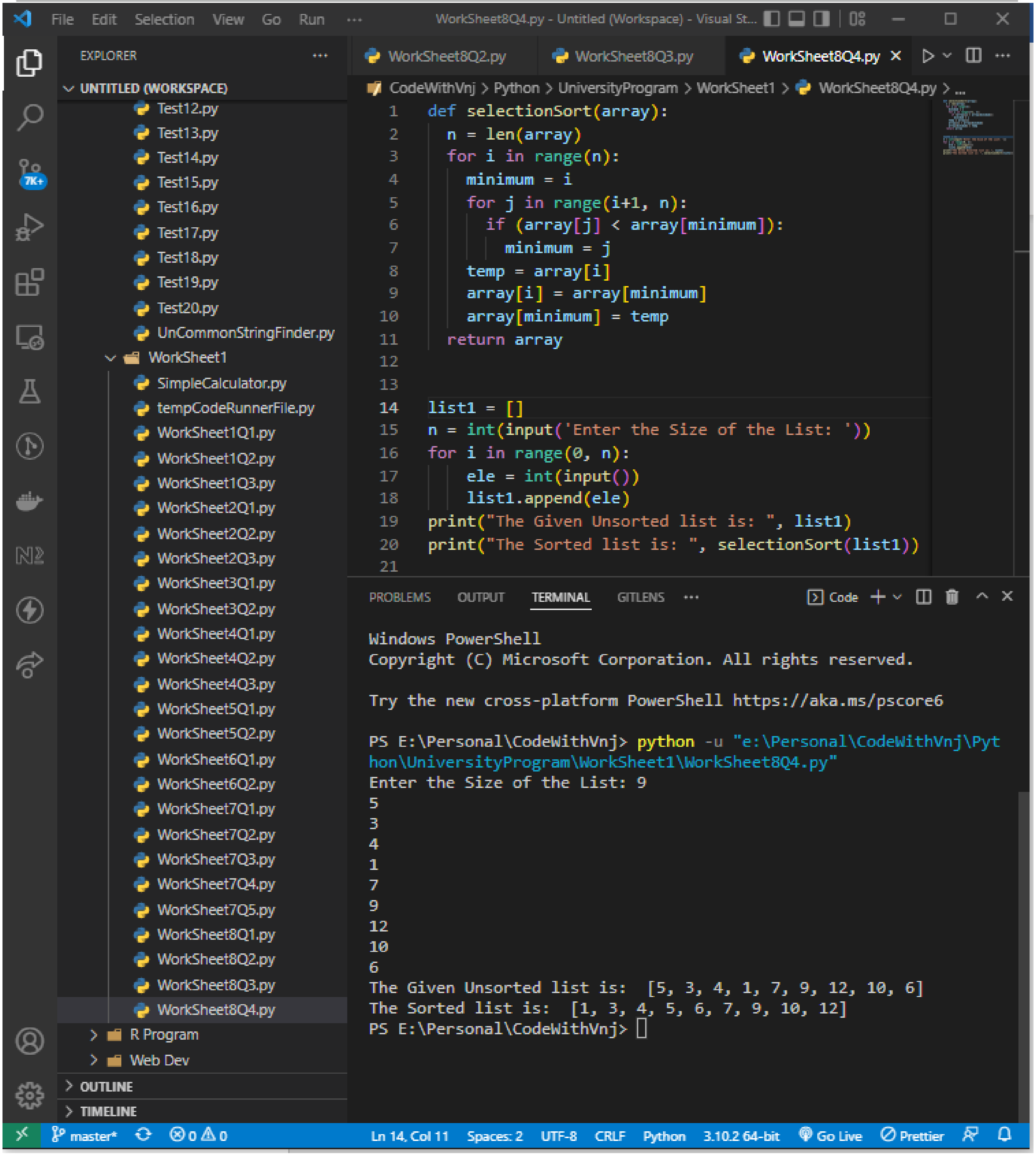

IV. Write a Python program to implement selection sort.



```python
def selectionSort(array):
  n = len(array)
  for i in range(n):
    minimum = i
    for j in range(i+1, n):
      if (array[j] < array[minimum]):
        minimum = j
    temp = array[i]
    array[i] = array[minimum]
    array[minimum] = temp
  return array


list1 = []
n = int(input('Enter the Size of the List: '))
for i in range(0, n):
    ele = int(input())
    list1.append(ele)
print("The Given Unsorted list is: ", list1)
print("The Sorted list is: ", selectionSort(list1))
```

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\Personal\CodeWithVnj> python -u "e:\Personal\CodeWithVnj\Pyt
hon\UniversityProgram\WorkSheet1\WorkSheet8Q4.py"
Enter the Size of the List: 9
5
3
4
1
7
9
12
10
6
The Given Unsorted list is:  [5, 3, 4, 1, 7, 9, 12, 10, 6]
The Sorted list is:  [1, 3, 4, 5, 6, 7, 9, 10, 12]
PS E:\Personal\CodeWithVnj> 
```

Learning outcomes (What I have learnt):

1. I have learnt, how to take List Input from User.

2. Learnt to implement various searching technique in the list.

3. Learnt to implement various sorting technique in the list.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			
4.			