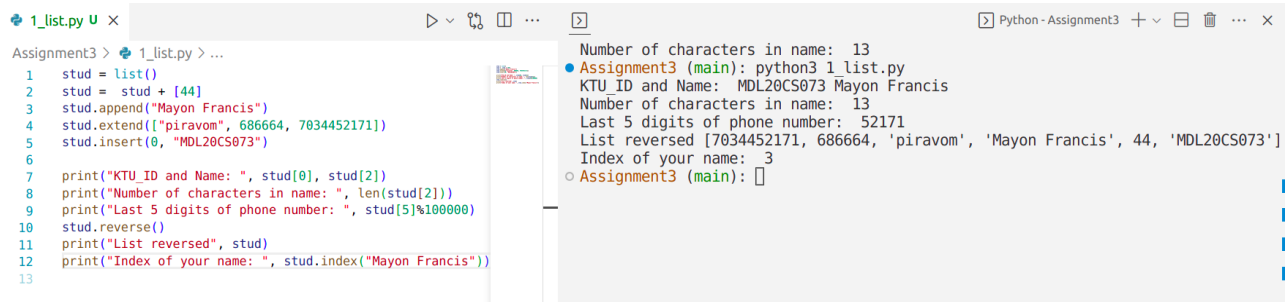
Programming in Python CST 362
Assignment 3

Mayon Francis
CS6A
44

1. List Manipulation

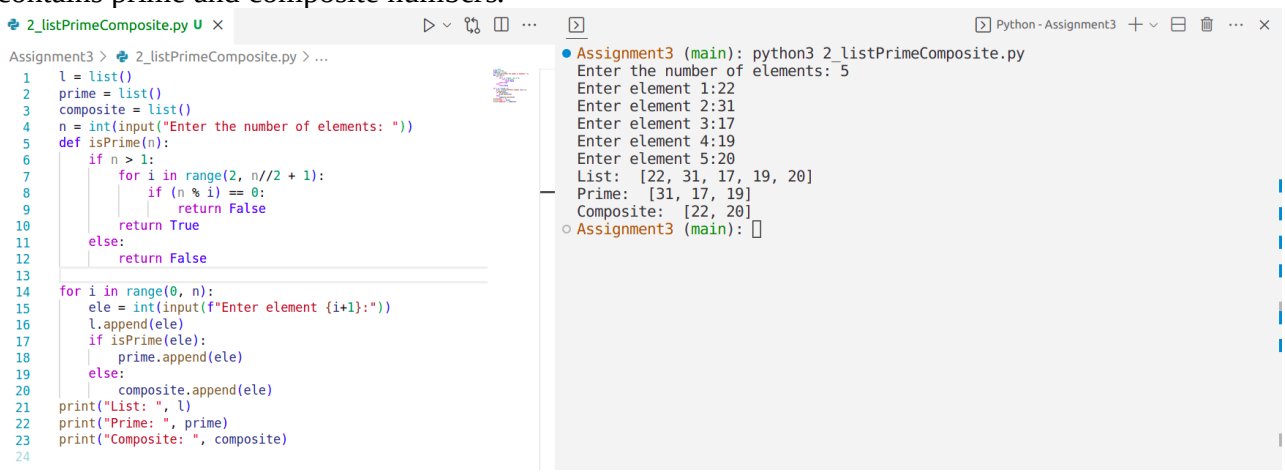


```
stud = list()
stud =  stud + [44]
stud.append("Mayon Francis")
stud.extend(["piravom", 686664, 7034452171])
stud.insert(0, "MDL20CS073")

print("KTU_ID and Name: ", stud[0], stud[2])
print("Number of characters in name: ", len(stud[2]))
print("Last 5 digits of phone number: ", stud[5]%100000)
stud.reverse()
print("List reversed", stud)
print("Index of your name: ", stud.index("Mayon Francis"))
```

```
Number of characters in name:  13
Assignment3 (main): python3 1_list.py
KTU_ID and Name:  MDL20CS073 Mayon Francis
Number of characters in name:  13
Last 5 digits of phone number:  52171
List reversed [7034452171, 686664, 'piravom', 'Mayon Francis', 44, 'MDL20CS073']
Index of your name:  3
Assignment3 (main):
```

2. Read list of numbers and store it in a list. Create two new lists from the list created which contains prime and composite numbers.

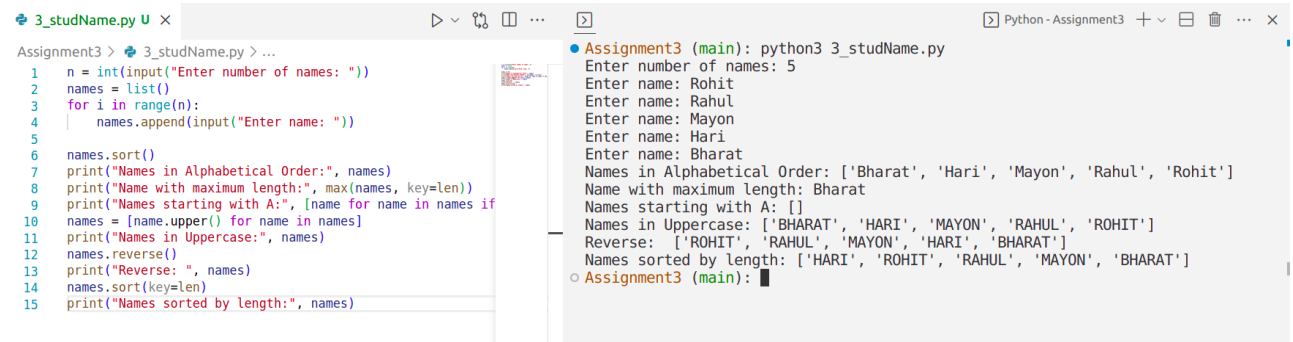


```
l = list()
prime = list()
composite = list()
n = int(input("Enter the number of elements: "))
def isPrime(n):
    if n > 1:
        for i in range(2, n//2 + 1):
            if (n % i) == 0:
                return False
        return True
    else:
        return False

for i in range(0, n):
    ele = int(input(f"Enter element {i+1}:"))
    l.append(ele)
    if isPrime(ele):
        prime.append(ele)
    else:
        composite.append(ele)
print("List: ", l)
print("Prime: ", prime)
print("Composite: ", composite)
```

```
Assignment3 (main): python3 2_listPrimeComposite.py
Enter the number of elements: 5
Enter element 1:22
Enter element 2:31
Enter element 3:17
Enter element 4:19
Enter element 5:20
List:  [22, 31, 17, 19, 20]
Prime:  [31, 17, 19]
Composite:  [22, 20]
Assignment3 (main):
```

3. Read list of students names and do the following

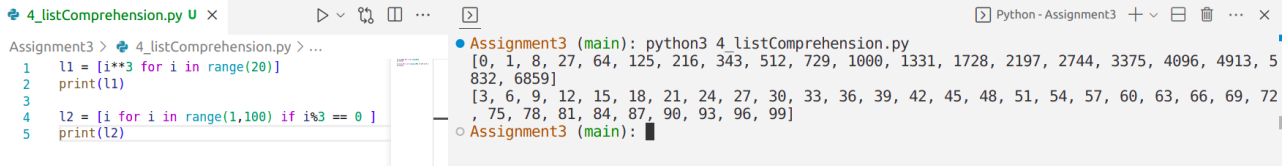


```
n = int(input("Enter number of names: "))
names = list()
for i in range(n):
    names.append(input("Enter name: "))

names.sort()
print("Names in Alphabetical Order:", names)
print("Name with maximum length:", max(names, key=len))
print("Names starting with A:", [name for name in names if
names = [name.upper() for name in names]
print("Names in Uppercase:", names)
names.reverse()
print("Reverse: ", names)
names.sort(key=len)
print("Names sorted by length:", names)
```

```
Assignment3 (main): python3 3_studName.py
Enter number of names: 5
Enter name: Rohit
Enter name: Rahul
Enter name: Mayon
Enter name: Hari
Enter name: Bharat
Names in Alphabetical Order: ['Bharat', 'Hari', 'Mayon', 'Rahul', 'Rohit']
Name with maximum length: Bharat
Names starting with A: []
Names in Uppercase: ['BHARAT', 'HARI', 'MAYON', 'RAHUL', 'ROHIT']
Reverse:  ['ROHIT', 'RAHUL', 'MAYON', 'HARI', 'BHARAT']
Names sorted by length: ['HARI', 'ROHIT', 'RAHUL', 'MAYON', 'BHARAT']
Assignment3 (main):
```

4. Use list comprehension to create lists

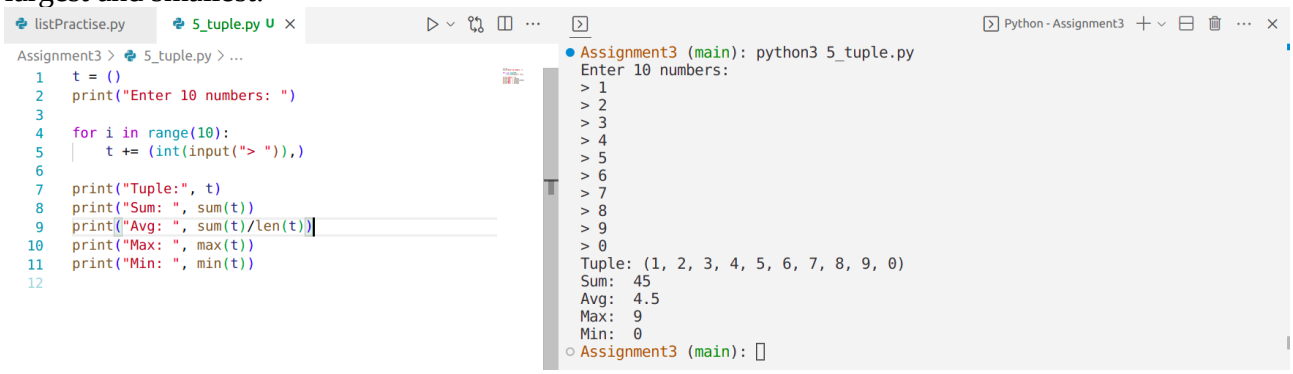


```
l1 = [i**3 for i in range(20)]
print(l1)

l2 = [i for i in range(1,100) if i%3 == 0 ]
print(l2)
```

```
Assignment3 (main): python3 4_listComprehension.py
[0, 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375, 4096, 4913, 5
832, 6859]
[3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72
, 75, 78, 81, 84, 87, 90, 93, 96, 99]
Assignment3 (main):
```

5. Read 10 numbers and stores it in a tuple. Find the sum, average of these elements also find the largest and smallest.



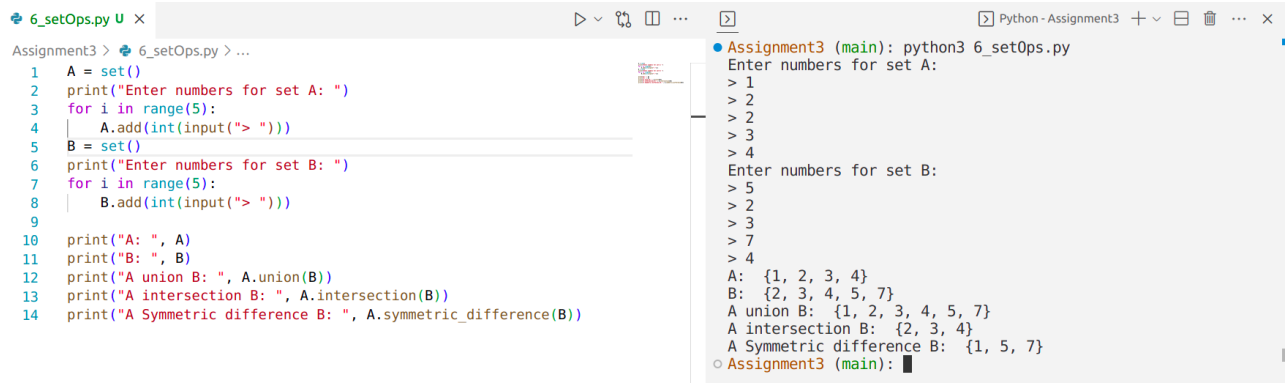
```
t = ()
print("Enter 10 numbers: ")

for i in range(10):
    t += (int(input("> ")),)

print("Tuple:", t)
print("Sum: ", sum(t))
print("Avg: ", sum(t)/len(t))
print("Max: ", max(t))
print("Min: ", min(t))
```

```
Assignment3 (main): python3 5_tuple.py
Enter 10 numbers:
> 1
> 2
> 3
> 4
> 5
> 6
> 7
> 8
> 9
> 0
Tuple: (1, 2, 3, 4, 5, 6, 7, 8, 9, 0)
Sum:  45
Avg:  4.5
Max:  9
Min:  0
Assignment3 (main):
```

6. Find the union, intersection and symmetric difference of two sets A and B. Read the sets.

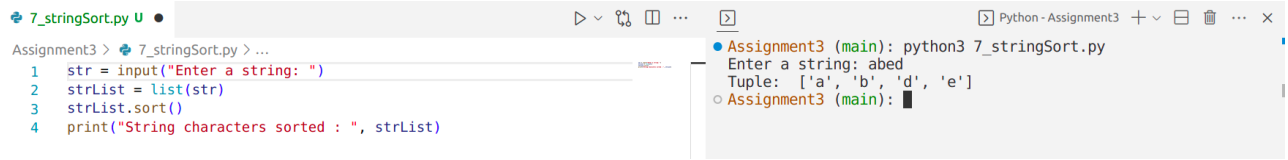


```
A = set()
print("Enter numbers for set A: ")
for i in range(5):
    A.add(int(input("> ")))
B = set()
print("Enter numbers for set B: ")
for i in range(5):
    B.add(int(input("> ")))

print("A: ", A)
print("B: ", B)
print("A union B: ", A.union(B))
print("A intersection B: ", A.intersection(B))
print("A Symmetric difference B: ", A.symmetric_difference(B))
```

```
Assignment3 (main): python3 6_setOps.py
Enter numbers for set A:
> 1
> 2
> 2
> 3
> 4
Enter numbers for set B:
> 5
> 2
> 3
> 7
> 4
A:  {1, 2, 3, 4}
B:  {2, 3, 4, 5, 7}
A union B:  {1, 2, 3, 4, 5, 7}
A intersection B:  {2, 3, 4}
A Symmetric difference B:  {1, 5, 7}
Assignment3 (main):
```

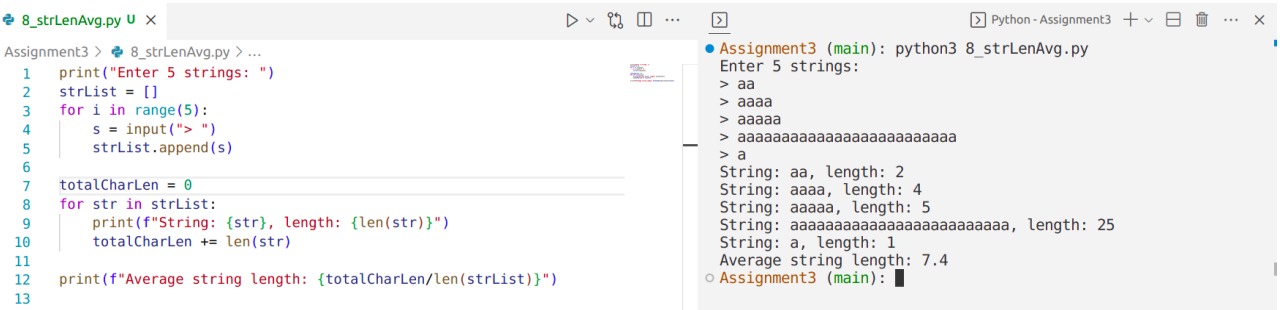
7.Read a string and print the words in alphabetical order



```
str = input("Enter a string: ")
strList = list(str)
strList.sort()
print("String characters sorted : ", strList)
```

```
Assignment3 (main): python3 7_stringSort.py
Enter a string: abed
Tuple:  ['a', 'b', 'd', 'e']
Assignment3 (main):
```

8.Read a string and print the words and its legth.Also find the average word length.



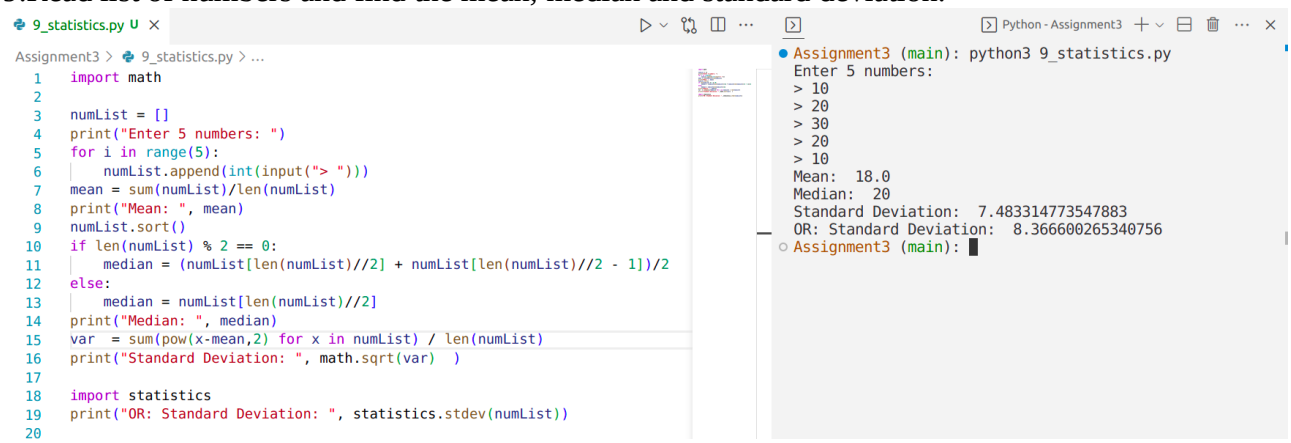
```
print("Enter 5 strings: ")
strList = []
for i in range(5):
    s = input("> ")
    strList.append(s)

totalCharLen = 0
for str in strList:
    print(f"String: {str}, length: {len(str)}")
    totalCharLen += len(str)

print(f"Average string length: {totalCharLen/len(strList)}")
```

```
Assignment3 (main): python3 8_strLenAvg.py
Enter 5 strings:
> aa
> aaaa
> aaaaa
> aaaaaaaaaaaaaaaaaaaaaaaa
> a
String: aa, length: 2
String: aaaa, length: 4
String: aaaaa, length: 5
String: aaaaaaaaaaaaaaaaaaaaaaaa, length: 25
String: a, length: 1
Average string length: 7.4
Assignment3 (main):
```

9.Read list of numbers and find the mean, median and standard deviation.



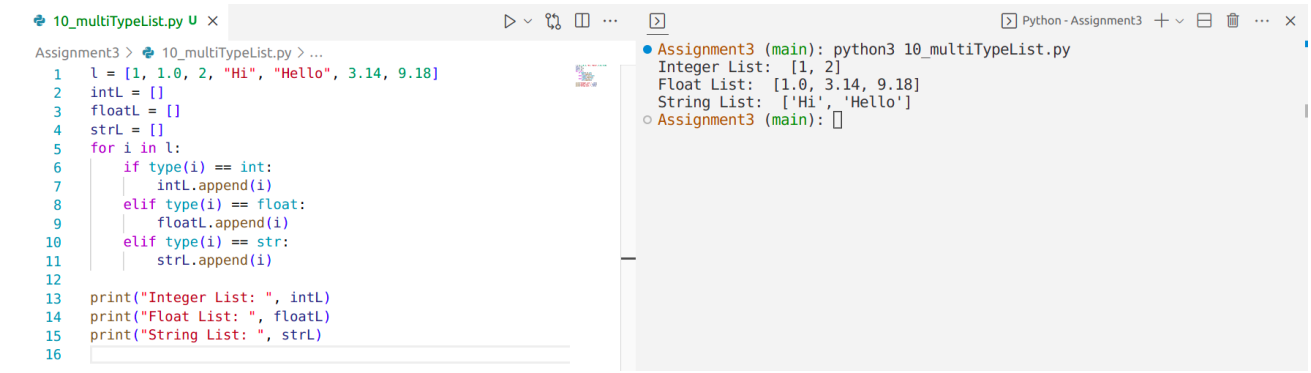
```
import math

numList = []
print("Enter 5 numbers: ")
for i in range(5):
    numList.append(int(input("> ")))
mean = sum(numList)/len(numList)
print("Mean: ", mean)
numList.sort()
if len(numList) % 2 == 0:
    median = (numList[len(numList)//2] + numList[len(numList)//2 - 1])/2
else:
    median = numList[len(numList)//2]
print("Median: ", median)
var  = sum(pow(x-mean,2) for x in numList) / len(numList)
print("Standard Deviation: ", math.sqrt(var)  )

import statistics
print("OR: Standard Deviation: ", statistics.stdev(numList))
```

```
Assignment3 (main): python3 9_statistics.py
Enter 5 numbers:
> 10
> 20
> 30
> 20
> 10
Mean:  18.0
Median:  20
Standard Deviation:  7.483314773547883
OR: Standard Deviation:  8.366600265340756
Assignment3 (main):
```

10. Consider a list consisting of integers, floating point numbers and strings. Separate them into different lists depending on the data types.

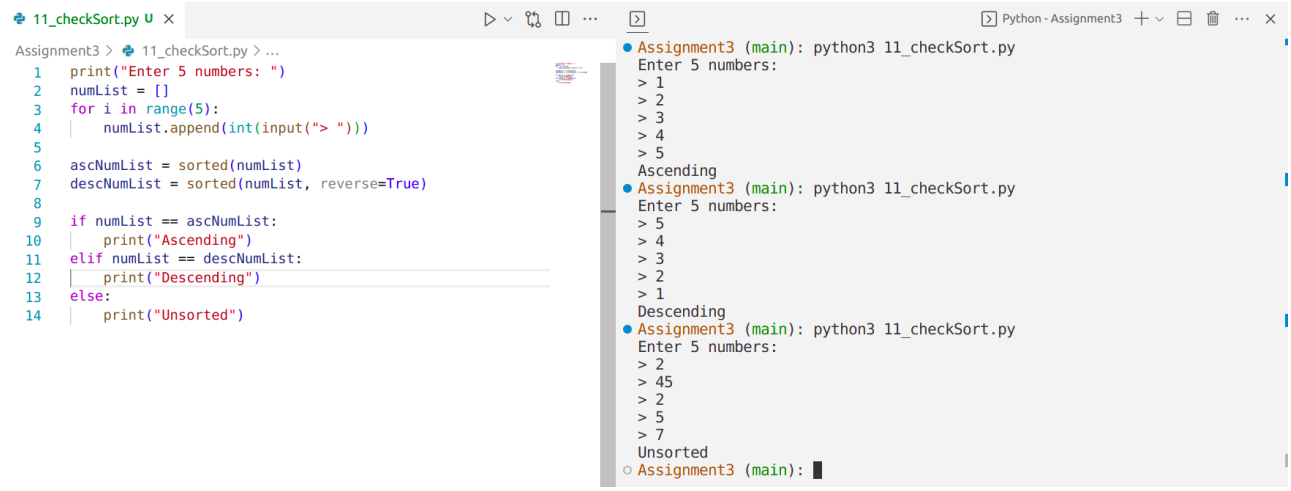


```
l = [1, 1.0, 2, "Hi", "Hello", 3.14, 9.18]
intL = []
floatL = []
strL = []
for i in l:
    if type(i) == int:
        intL.append(i)
    elif type(i) == float:
        floatL.append(i)
    elif type(i) == str:
        strL.append(i)

print("Integer List: ", intL)
print("Float List: ", floatL)
print("String List: ", strL)
```

```
Assignment3 (main): python3 10_multiTypeList.py
Integer List:  [1, 2]
Float List:  [1.0, 3.14, 9.18]
String List:  ['Hi', 'Hello']
Assignment3 (main):
```

11. Check if the items in the list are sorted in ascending or descending order and print suitable messages accordingly. Otherwise, print “Items in list are not sorted”



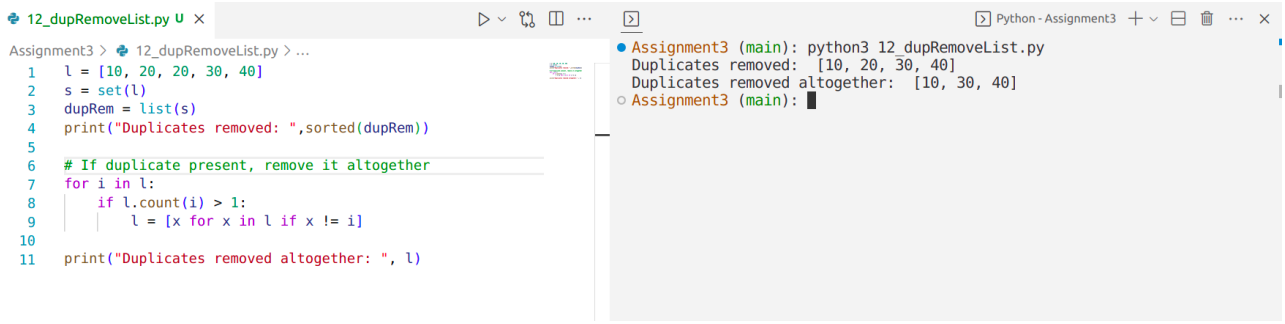
```
print("Enter 5 numbers: ")
numList = []
for i in range(5):
    numList.append(int(input("> ")))

ascNumList = sorted(numList)
descNumList = sorted(numList, reverse=True)

if numList == ascNumList:
    print("Ascending")
elif numList == descNumList:
    print("Descending")
else:
    print("Unsorted")
```

```
Assignment3 (main): python3 11_checkSort.py
Enter 5 numbers:
> 1
> 2
> 3
> 4
> 5
Ascending
Assignment3 (main): python3 11_checkSort.py
Enter 5 numbers:
> 5
> 4
> 3
> 2
> 1
Descending
Assignment3 (main): python3 11_checkSort.py
Enter 5 numbers:
> 2
> 45
> 2
> 5
> 7
Unsorted
Assignment3 (main):
```

12.Remove all duplicate elements from a list i/p:10 20 20 30 40 o/p:10 30 40



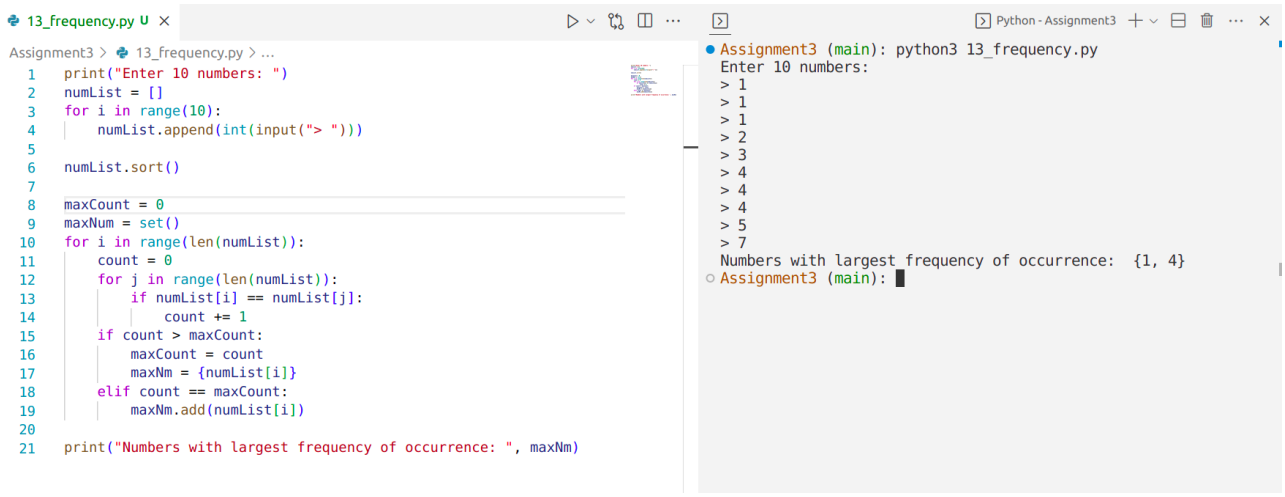
```
l = [10, 20, 20, 30, 40]
s = set(l)
dupRem = list(s)
print("Duplicates removed: ",sorted(dupRem))

# If duplicate present, remove it altogether
for i in l:
    if l.count(i) > 1:
        l = [x for x in l if x != i]

print("Duplicates removed altogether: ", l)
```

```
Assignment3 (main): python3 12_dupRemoveList.py
Duplicates removed:  [10, 20, 30, 40]
Duplicates removed altogether:  [10, 30, 40]
Assignment3 (main):
```

13.Find the number with largest frequency of occurrence. i/p:10 20 30 40 40 40 50 50 o/p:40



```
print("Enter 10 numbers: ")
numList = []
for i in range(10):
    numList.append(int(input("> ")))

numList.sort()

maxCount = 0
maxNum = set()
for i in range(len(numList)):
    count = 0
    for j in range(len(numList)):
        if numList[i] == numList[j]:
            count += 1
    if count > maxCount:
        maxCount = count
        maxNm = {numList[i]}
    elif count == maxCount:
        maxNm.add(numList[i])

print("Numbers with largest frequency of occurrence: ", maxNm)
```

```
Assignment3 (main): python3 13_frequency.py
Enter 10 numbers:
> 1
> 1
> 1
> 2
> 3
> 4
> 4
> 4
> 5
> 7
Numbers with largest frequency of occurrence:  {1, 4}
Assignment3 (main):
```