Deborah Barndt

ITMD 513 Open Source Programming

Professor Dr. Sam

Hw5

2-20-19

```
Question 1: (Sorted?)

'''
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2-20-19
SortedList.py
hw5: Question 1 Sorted List

This program will prompt the user to enter a list and display whether the list
is sorted or not sorted.

Written by Deborah Barndt.
'''

# Function that returns true if the list is already sorted in increasing order.
def isSorted(lst):
    for i in range(len(lst) - 1):
        if (lst[i] > lst[i + 1]):
            return False
    return True

# Function that will prompt the user to enter a list and then displays whether
# the list is sorted or is not sorted.
```
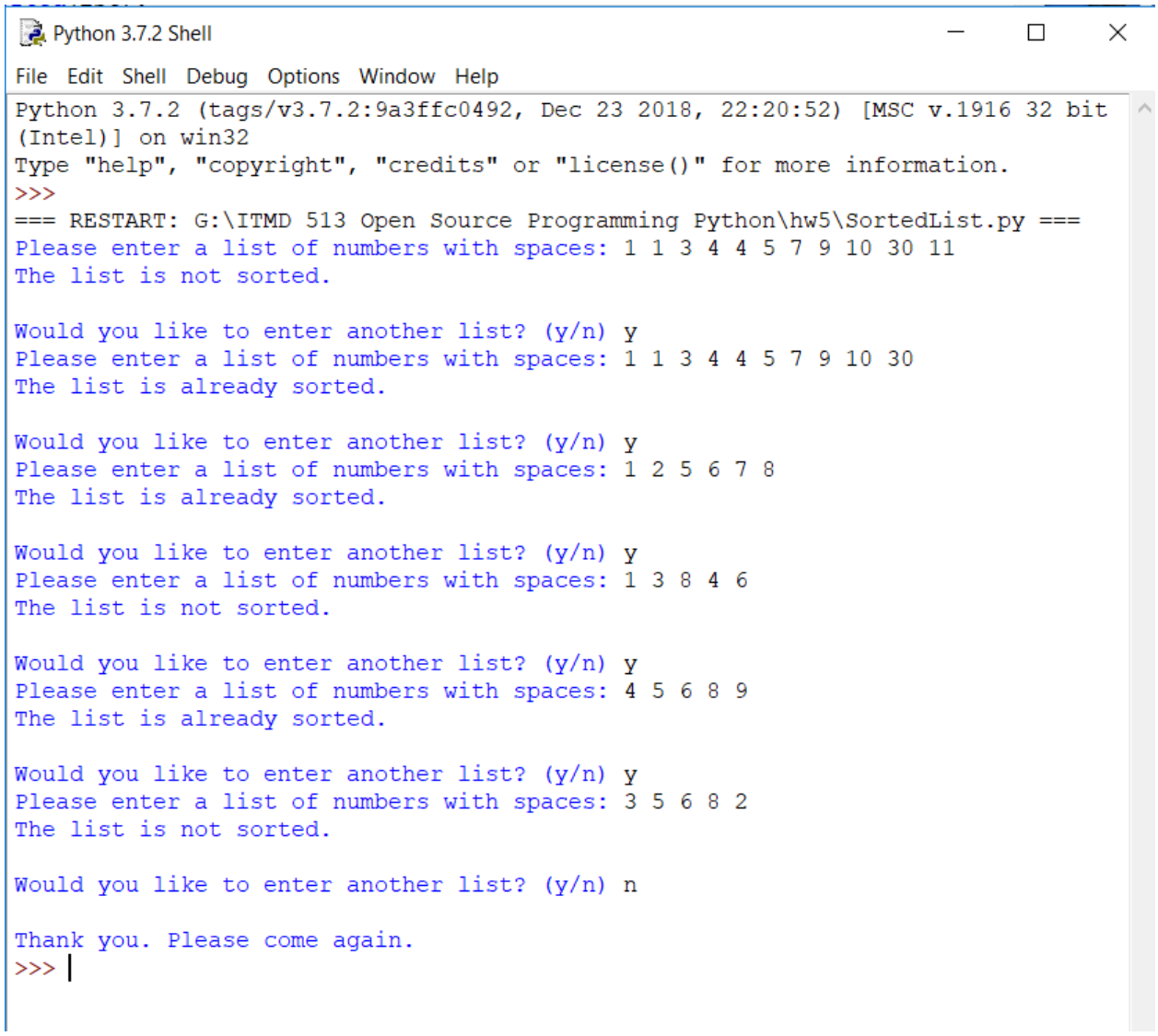

```
24  def main():
25      enterAgain = 'y'
26
27      while (enterAgain == 'y'):
28          lst = input('Please enter a list of numbers with spaces: ')
29
30          lst = lst.split(' ')
31
32          for i in range(len(lst)):
33              lst[i] = int(lst[i])
34          if isSorted(lst):
35              print('The list is already sorted.')
36
37              # Ask the user if they would like to enter another list.
38              enterAgain = input('\nWould you like to enter another list? (y/n) ')
39          else:
40              print('The list is not sorted.')
41
42              # Ask the user if they would like to enter another list.
43              enterAgain = input('\nWould you like to enter another list? (y/n) ')
44
45              if (enterAgain == 'n'):
46                  print('\nThank you. Please come again.')
47
48
49  # Call the main function to begin the test program.
50  main()
51
52  Output Result:
```



Question 2: (Algebra: multiply two matrices)

'''

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AlgebraMatrix.py

hw5: Question 2 Algebra Matrix

This program will prompt a user to enter two 3 x 3 matrices and display their

```
64      product.
65
66      Written by Deborah Barndt.
67      '''
68
69      # Function that will multiply two matrices given by the user.
70      def multiplyMatrix(a, b):
71          rowA = len(a)
72          colA = len(a[0])
73          rowB = len(b)
74          colB = len(b[0])
75
76          if (colA != rowB):
77              print('You entered the wrong dimensions for matrices.')
78              return
79
80          result = [[0 for row in range(colB)] for col in range(rowA)]
81
82          # For loop to iterate through each of the rows and columns.
83          for i in range(rowA):
84              for j in range(colB):
85                  for k in range(colA):
86                      result[i][j] += round(a[i][k] * b[k][j], 1)
87
88          return result
89
90      # Function to prompt the user to enter the two 3 x 3 matrices and displays
91      # the product.
92      def userMatrix(num):
```

```
93      userinput = input('Enter a matrix with spaces for matrix' + str(num) + ': ').split()
94
95      userinput = list(map(float, userinput))
96      total = len(userinput)
97      row = int(total ** 0.5)
98
99      matrix = [userinput[i:i + row] for i in range(0, total, row)]
100
101     return matrix
102
103 # Function that will store the input into both matrices.
104 def main():
105     matrix1 = userMatrix(1)
106     matrix2 = userMatrix(2)
107     productMatrix = multiplyMatrix(matrix1, matrix2)
108     display = [[' ', ' '], ['* ', '= '], [' ', ' ']]
109
110     print('The multplication of the matrices is:\n')
111
112     for i in range(len(matrix1)):
113         print(str(matrix1[i][0]) + ' ' + str(matrix1[i][1]) + ' '
114             + str(matrix1[i][2]) + '\t ' + display[i][0] + str(matrix2[i][0])
115             + ' ' + str(matrix2[i][1]) + ' ' + str(matrix2[i][2]) + '\t '
116             + display[i][1] + str(productMatrix[i][0]) + ' '
117             + str(productMatrix[i][1]) + ' ' + str(productMatrix[i][2]))
118
119
120 # Call the main function to begin the program.
121 main()
```

Output Result: