

Deborah Barndt

ITMD 513 Open Source Programming

Professor Dr. Sam

Hw5

2-20-19

1 Question 1: (Sorted?)

2

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5 2-20-19

6 SortedList.py

7 hw5: Question 1 Sorted List

8

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

11

12 Written by Deborah Barndt.

13 '''

14

15 # Function that returns true if the list is already sorted in increasing order.

16 def isSorted(lst):

17 for i in range(len(lst) - 1):

18 if (lst[i] > lst[i + 1]):

19 return False

20 return True

21

22 # Function that will prompt the user to enter a list and then displays whether

23 # 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:
```

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=== RESTART: G:\ITMD 513 Open Source Programming Python\hw5\SortedList.py ===
Please enter a list of numbers with spaces: 1 1 3 4 4 5 7 9 10 30 11
The list is not sorted.

Would you like to enter another list? (y/n) y
Please enter a list of numbers with spaces: 1 1 3 4 4 5 7 9 10 30
The list is already sorted.

Would you like to enter another list? (y/n) y
Please enter a list of numbers with spaces: 1 2 5 6 7 8
The list is already sorted.

Would you like to enter another list? (y/n) y
Please enter a list of numbers with spaces: 1 3 8 4 6
The list is not sorted.

Would you like to enter another list? (y/n) y
Please enter a list of numbers with spaces: 4 5 6 8 9
The list is already sorted.

Would you like to enter another list? (y/n) y
Please enter a list of numbers with spaces: 3 5 6 8 2
The list is not sorted.

Would you like to enter another list? (y/n) n

Thank you. Please come again.
>>> |
```

53

54

55 Question 2: (Algebra: multiply two matrices)

56

57 '''

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60 AlgebraMatrix.py

61 hw5: Question 2 Algebra Matrix

62

63 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 multiplication 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()

```

122 Output Result:

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
== RESTART: E:\ITMD 513 Open Source Programming Python\hw5\AlgebraMatrix.py ==
Enter a matrix with spaces for matrix1: 1 2 4 5 6 7 5
Enter a matrix with spaces for matrix2: 1 2 3 4 5 6 8 7 9
You entered the wrong dimensions for matrices.
The multiplication of the matrices is:
```

123

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
== RESTART: E:\ITMD 513 Open Source Programming Python\hw5\AlgebraMatrix.py ==
Enter a matrix with spaces for matrix1: 1 2 3 4 5 6 7 8 9
Enter a matrix with spaces for matrix2: 0 2 4 1 4.5 2.2 1.1 4.3 5.2
The multiplication of the matrices is:

1.0 2.0 3.0      0.0 2.0 4.0      5.3 23.9 24.0
4.0 5.0 6.0      * 1.0 4.5 2.2      = 11.6 56.3 58.2
7.0 8.0 9.0      1.1 4.3 5.2      17.9 88.7 92.4
>>>
== RESTART: E:\ITMD 513 Open Source Programming Python\hw5\AlgebraMatrix.py ==
Enter a matrix with spaces for matrix1: 9 8 7 6 5 4 3 2 1
Enter a matrix with spaces for matrix2: 6 4 3 2 5 7 9 8 1
The multiplication of the matrices is:

9.0 8.0 7.0      6.0 4.0 3.0      133.0 132.0 90.0
6.0 5.0 4.0      * 2.0 5.0 7.0      = 82.0 81.0 57.0
3.0 2.0 1.0      9.0 8.0 1.0      31.0 30.0 24.0
>>>
== RESTART: E:\ITMD 513 Open Source Programming Python\hw5\AlgebraMatrix.py ==
Enter a matrix with spaces for matrix1: 3 2 1 6 5 7 4 2 9
Enter a matrix with spaces for matrix2: 2 4 6 8 10 12 14 16 18
The multiplication of the matrices is:

3.0 2.0 1.0      2.0 4.0 6.0      36.0 48.0 60.0
6.0 5.0 7.0      * 8.0 10.0 12.0      = 150.0 186.0 222.0
4.0 2.0 9.0      14.0 16.0 18.0      150.0 180.0 210.0
>>>
== RESTART: E:\ITMD 513 Open Source Programming Python\hw5\AlgebraMatrix.py ==
Enter a matrix with spaces for matrix1: 4 1 2 7 7 3 8 4 7
Enter a matrix with spaces for matrix2: 5 5 4 3 1 2 6 0 8
The multiplication of the matrices is:

4.0 1.0 2.0      5.0 5.0 4.0      35.0 21.0 34.0
7.0 7.0 3.0      * 3.0 1.0 2.0      = 74.0 42.0 66.0
8.0 4.0 7.0      6.0 0.0 8.0      94.0 44.0 96.0
>>> |
```

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