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Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

week 4

Week 5

Week 6

Week 7

Week 8

Week 9

- Natural Language Processing - Author

Programming Assignment 3: Rotate the matrix

Due on 2020-04-02, 23:59 IST

Given a square matrix with n rows and n columns, you have to write a program to rotate this matrix such that each element is shifted by one place in a clockwise manner.

For example, given the following matrix

```
1 2 3
4 5 6
7 8 9
```

The output should be

```
4 1 2
7 5 3
8 9 6
```

Input Format:

The first line of the input contains a number n representing the number of rows and columns.

After this, there are n rows with each row containing n elements separated by a space

Output Format:

Print the elements of the modified matrix with each row in a new line and all the elements in each row is separated by a space.

Example 1:

Input:
3

Stylometry
(unit?
unit=164&lesson=165)

```

~
1 2 3
4 5 6
7 8 9

```

- Natural Language Processing - Author Stylometry - Part 01 (unit? unit=164&lesson=166)

Output:

```

4 1 2
7 5 3
8 9 6

```

Example 2:

Input:

```

4
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16

```

- Natural Language Processing - Author Stylometry - Part 02 (unit? unit=164&lesson=167)

Output:

```

5 1 2 3
9 10 6 4
13 11 7 8
14 15 16 12

```

- Natural Language Processing - Author Stylometry - Part 03 (unit? unit=164&lesson=168)

Explanation:

In the first example, there is an odd number of rows and columns hence excluding the middle element i.e. 5 all the elements were shifted by one position in a clockwise manner.

In the second example, there are even number of rows and columns hence all the elements were shifted by one position in a clockwise manner

- Natural Language Processing - Author Stylometry - Part 04 (unit? unit=164&lesson=169)

Sample Test Cases

- Natural Language Processing - Author Stylometry - Part 05 (unit? unit=164&lesson=170)

Input

```

6
1 1 2 2 3 3
Test Case 1
2 2 3 3 4 4
3 3 4 4 5 5
4 4 5 5 6 6
5 5 6 6 7 7
6 6 7 7 8 8

```

Output

```

2 1 1 2 2 3
3 3 2 3 3 3
4 4 5 4 4 4
5 5 5 4 5 5
6 6 6 7 6 6
6 7 7 8 8 7

```

- Natural Language Processing - Author Stylometry - Part 06 (unit? unit=164&lesson=171)

- Natural Language Processing - Author Stylometry - Part 07 (unit? unit=164&lesson=172)

- Natural Language Processing -

Author Stylometry - Part 08 (unit? unit=164&lesson=173)	18 7 43 9 26 39 8 14 49 24 28 37 34 18 27 23 6 27 2 0	33 7 43 9 26 39 8 14 49 24 28 37 34 18 27 23 6 2 7
○ Natural Language Processing - Author Stylometry - Part 09 (unit? unit=164&lesson=174)	33 12 8 39 50 49 1 36 34 24 23 17 28 7 10 38 41 3 0 8 30 23 45 16 39 4 7 16 39 29 13 6 47 15 4 46 37 10 2 16 50 9 45 7 3 37 3 2 11 39 39 37 20 25 45 1 3	8 30 12 8 39 50 49 1 36 34 24 23 17 28 7 10 38 2 0 10 2 16 23 45 16 39 4 7 16 39 29 13 6 47 15 41 3 0 5 45 37 25 50 9 45 7 3 3 7 32 11 39 39 37 4 46 37 11 2 39 12 19 28 47 46 2 7 37 40 7 20 20 20 25 45 13
○ Natural Language Processing - Author Stylometry - Part 10 (unit? unit=164&lesson=175)	7 40 7 20 20 11 8 3 9 38 11 2 39 12 19 5 18 17 7 14 22 8 13 18 29 50 17 9 23 33 46 48 21 5 25 17 2 3 39 50 44 37 3 7 47 13 22	23 33 46 48 21 5 5 18 17 7 14 22 8 11 8 3 9 38 44 7 38 13 8 38 34 25 17 23 39 50 13 18 29 50 17 9
○ Introduction to Networkx - Part 01 (unit? unit=164&lesson=176)	44 7 38 13 8 38 34 7 49 21 50 40 12 44 20 38 27 34	35 6 17 37 39 19 41 21 7 49 21 44 37 3 7 47 13 22 48 37 43 34 31 33 20 41 28 43 50 40 12 44 20 38 27 34
○ Introduction to Networkx - Part 02 (unit? unit=164&lesson=177)	35 6 17 37 39 19 41 21 4 3 40 28 45 9 38 32 24 11 36	30 12 45 25 37 42 44 44 4 40 28 45 9 38 32 24 11 36
○ Six Degrees of Separation : Meet your favourites (unit? unit=164&lesson=178)	28 4 46 44 18 16 48 9 6 32 30 12 45 25 37 42 44 44 32 16 41 42 18 14 33 49 35 32	42 50 14 45 27 10 2 32 1 6 41 46 44 18 16 48 9 6 32 12 48 34 41 1 31 15 41 2 4 29 15 42 18 14 33 49 3 5 32
○ Six Degrees of Separation : Meet your favourites - Part 01 (unit? unit=164&lesson=179)	42 50 14 45 27 10 2 15 4 1 24 29 15 7 49 38 36 46 12 12 48 34 41 1 31 50 41 3 1 9 42 46 9 8 19 7 19 42 40 46 25 12 18 27 6 18 1 1 19 34 36 37 46 14 37 3 6 45	40 46 25 12 18 50 41 31 9 42 46 9 7 49 38 36 46 12 10 12 49 18 27 6 18 11 1 9 34 36 37 46 8 19 7 19 42
○ Six Degrees of Separation : Meet your favourites - Part 02 (unit? unit=164&lesson=180)	10 12 49 18 38 39 47 13 7 49 24 28 49 26 21 44 1 7 34 11 11 46 11 15 20 13 42 41 33 15 8 11 15 49 20 2 9 3	11 11 46 38 39 47 13 7 4 9 24 28 49 26 21 14 37 3 6 45 9 1 11 15 20 13 42 41 33 15 8 11 15 49 20 44 17 3 4
○ Six Degrees of Separation : Meet your favourites - Part 03 (unit? unit=164&lesson=181)	9 1 1 38 9 49 30 47 49 1 4 29 44 38 30 10 44 2 38 16 2 16 42 31 32 31 21 1 4 49 45 24 39 42 15 19 4 4 19	16 1 38 9 49 30 47 49 14 29 44 38 30 10 44 2 29 3 2 16 42 31 32 31 21 14 4 9 45 24 39 42 15 19 44 1 9 38
○ Area Calculation - Don't Measure		

Test
Case
2

(unit? unit=164&lesson=182)		11 7 13 41 46 35 21 22 43 2 2 45 48 23 28 15 10 16 2 20 11 3 6 38 47 45 44 22 25 2 10 35 1 3 48 46	23 7 13 41 46 35 21 22 4 3 22 45 45 44 28 15 10 16 2 20 1 1 36 48 1 14 37 22 25 2 10 35 1 38 47 17 40 2 12 14 22 50 4 3 48 46 16 43 46 7 20 12 15 43 3 8 30 36 15 39 44 39 1 6 48 39 4 23 40 45 22 28 17 31 41 32 24 37 27 25 7 3 40 19 21 4 23 17 28 47 7 43 9 22 25 13 38 15 4 50 32 38 50 46 6 3 36 10 41 47 1 17 8 20 45 10 10 49 50 18 16 3 11 47
<input type="radio"/> Area Calculation - Don't Measure - Part 01 (unit? unit=164&lesson=183)		1 14 37 14 22 50 4 43 38 30 36 17 40 2 12 12 15 48 39 4 23 40 16 43 46 7 20 6 32 24 37 27 25 15 39 44 39 1 31 41 17 2 8 47 7 45 22 28 17 19 21 4 23 5 0 32 38 7 3 40 22 25 13 38 15 4 17 8 43 9 46 6 3 36 10 41 47 1 47 50 20 45 10 10 49 50 18 16 3 11	
<input type="radio"/> Area Calculation - Don't Measure - Part 02 (unit? unit=164&lesson=184)	Test Case 3	3 1 2 3 4 5 6 7 8 9	4 1 2 7 5 3 8 9 6
<input type="radio"/> Area Calculation - Don't Measure - Part 03 (unit? unit=164&lesson=185)		4 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	5 1 2 3 9 10 6 4 13 11 7 8 14 15 16 12
<input type="radio"/> Area Calculation - Don't Measure - Part 04 (unit? unit=164&lesson=186)		5 4 1 4 2 3 6 1 3 1 6 2 9 1 5 3 6 8 9 3 2 0 1 5 2 9	6 4 1 4 2 2 9 1 3 3 6 8 1 1 6 0 9 3 5 3 1 5 2 9 2
<input type="radio"/> Area Calculation - Don't Measure - Part 05 (unit? unit=164&lesson=187)	Test Case 4		
<input type="radio"/> Area Calculation - Don't Measure - Part 06 (unit? unit=164&lesson=188)	Test Case 5		
<input type="radio"/> Quiz : Assignment 9 (assessment? name=285)			
<input type="radio"/> Programming Assignment 1: Swap the Case (/noc20_cs35/progassignment? name=311)	Test Case 6		
<input type="radio"/> Programming Assignment-2: First and Last (/noc20_cs35/progassignment? name=312)			
<input type="radio"/> Programming Assignment 3: Rotate the matrix (/noc20_cs35/progassi name=313)		1 # Python program to rotate a matrix 2 3 # Function to rotate a matrix 4 def rotateMatrix(mat): 5 6 if not len(mat): 7 return 8 9 """ 10 top : starting row index	

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.
Sample solutions (Provided by instructor)

```

1 # Python program to rotate a matrix
2
3 # Function to rotate a matrix
4 def rotateMatrix(mat):
5
6     if not len(mat):
7         return
8
9     """
10         top : starting row index

```

○ Week 9
 Feedback
 (unit?
 unit=164&lesson=314)

Week 10

Week 11

Week 12

Text Transcripts

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```

11         bottom : ending row index
12         left : starting column index
13         right : ending column index
14     """
15
16     top = 0
17     bottom = len(mat)-1
18
19     left = 0
20     right = len(mat[0])-1
21
22     while left < right and top < bottom:
23
24         # Store the first element of next row,
25         # this element will replace first element of
26         # current row
27         prev = mat[top+1][left]
28
29         # Move elements of top row one step right
30         for i in range(left, right+1):
31             curr = mat[top][i]
32             mat[top][i] = prev
33             prev = curr
34
35         top += 1
36
37         # Move elements of rightmost column one step downwards
38         for i in range(top, bottom+1):
39             curr = mat[i][right]
40             mat[i][right] = prev
41             prev = curr
42
43         right -= 1
44
45         # Move elements of bottom row one step left
46         for i in range(right, left-1, -1):
47             curr = mat[bottom][i]
48             mat[bottom][i] = prev
49             prev = curr
50
51         bottom -= 1
52
53         # Move elements of leftmost column one step upwards
54         for i in range(bottom, top-1, -1):
55             curr = mat[i][left]
56             mat[i][left] = prev
57             prev = curr
58
59         left += 1
60
61     return mat
62
63 # Utility Function
64 def printMatrix(mat,n):
65     for i in range(n):
66         for j in range(n):
67             if(j==n-1):
68                 print(mat[i][j],end="")
69             else:
70                 print(mat[i][j],end=" ")
71
72         if(i!=n-1):
73             print()
74
75 n = int(input())
76
77 matrix = []
78 for i in range(1,n+1):
79     l = list(map(int, input ().split ()))
80     matrix.append(l)
81
82 matrix = rotateMatrix(matrix)
83 # Print modified matrix
84 printMatrix(matrix,n)

```

