CS 171

Lab Assignment 10

This lab assignment uses many elements provided in the main bibliographic reference for

these lectures:

Programming in Python 3

A Complete Introduction to the Python Language,

2nd Edition,

Mark Summerfield

**Exercises**

**Exercise 1 String Matrix**

Given a String Matrix, perform column-wise concatenation of strings, handling variable lists lengths.

Examples：

Input: [[“Gfg”, “good”], [“is”, “for”]]

Output: [‘Gfgis’, ‘goodfor’]

Input: [[“Gfg”, “good”, “geeks”], [“is”, “for”, “best”]]

Output: [‘Gfgis’, ‘goodfor’, “geeksbest”]

Input: [['Gfg', 'good'], ['is', 'for'], ['Best']]

Output: ['GfgisBest', 'goodfor']

**Exercise 2 Array Monotonic**

Given an array A containing n integers. The task is to check whether the array is Monotonic or not. An array is monotonic if it is either monotone increasing or monotone decreasing.

An array A is monotone increasing if for all i <= j, A[i] <= A[j]. An array A is monotone decreasing if for all i <= j, A[i] >= A[j].

Return “True” if the given array A is monotonic else return “False” (without quotes).

Examples:

Input: [6, 5, 4, 4]

Output: true

Input: [5, 15, 20, 10]

Output: false

**Exercise 3 Pascal's Triangle**

Print Pascal's Triangle. n is the number of rows.

Example:

Input: n = 10

output:

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

1 6 15 20 15 6 1

1 7 21 35 35 21 7 1

1 8 28 56 70 56 28 8 1

1 9 36 84 126 126 84 36 9 1

**Exercise 4 Minimum Sum of Factors**

Given a number, find minimum sum of its factors.

Examples:

Input: 12

Output: 7

*Explanation:*

*Following are different ways to factorize 12 and sum of factors in different ways.*

*12 = 12 \* 1 = 12 + 1 = 13*

*12 = 2 \* 6 = 2 + 6 = 8*

*12 = 3 \* 4 = 3 + 4 = 7*

*12 = 2 \* 2 \* 3 = 2 + 2 + 3 = 7*

*Therefore minimum sum is 7*

Input: 105

Output: 15

**Exercise 5 Reverse linked list**

Given pointer to the head node of a linked list, the task is to reverse the linked list. We need to reverse the list by changing links between nodes.

Examples:

Input: Head of following linked list

1->2->3->4->NULL

Output: Linked list should be changed to,

4->3->2->1->NULL

Input: Head of following linked list

1->NULL

Output: Linked list should be changed to,

1->NULL