

Homework - 4

IC100 Introduction To Programming

Question 1

Given a matrix, identify if the matrix is symmetric or not. In the first line, you are given 1 integer n where n is the size of the input square matrix ($n \times n$). The next n lines contain n integers each, these are the elements of the matrix. You have to output Symmetric if the matrix is symmetric and Not Symmetric otherwise.

Example

Input:

3 // $n = 3$ (Size of the matrix)

1 2 3

2 3 4

3 4 5

Output:

Symmetric

Input:

3 3 // $n = 3$ (Dimensions of the matrix)

1 2 3

4 5 6

7 8 9

Output:

Not Symmetric

Question 2

Given an array which contains both positive and negative numbers, find if there is a subarray (of size at-least one) with 0 sum.

What is a subarray? Well, a subarray is a contiguous part of array. An array that is inside another array. For example, consider the array [1, 2, 3, 4], There are 10 non-empty sub-arrays. The subarrays are (1), (2), (3), (4), (1,2), (2,3), (3,4), (1,2,3), (2,3,4) and (1,2,3,4).

In the first line, you are given an integer n (size of the array) as input. In the second line you are given n numbers (the elements of the array).

You are supposed to output true in case there is a subarray (of size at-least one) with 0 sum else output false

Example

Input:

5 // Input Size of the array

4 2 0 1 6 // Input Array

Output:

Input:

true

5 // Input Size of the array

-3 2 3 1 6 // Input Array

Output:

false

Question 3

Check if the input integer can be expressed as the sum of two prime numbers of all possible combinations using functions. You have to write and use a function (which checks if given integer is prime or not) to solve this problem.

Input is a positive integer.

You are supposed to output true or false as per the case.

Example

Input:

5 // Input Integer

Output:

true // $5 = 3 + 2$

Input:

7 // Input Integer

Output:

true // $7 = 5 + 2$

Question 4

You are given a Roman numeral as a string in the input and you have to output the corresponding decimal integer.

The first line contains a single integer n denoting the size of the input string.

The second line consists of the string with n characters denoting the Roman Numeral.

Output a single integer denoting the number corresponding to the Roman numeral input.

Following is a chart showing Roman characters corresponding to various integer values. The input will only consist of characters from the following table.

Example

Input:

Roman Numeral	Number
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

1
X
Output:
10
Input:
10
MMMDCXXIV
Output:
3724
Input:
8
MDCCXXIX
Output:
1729

Question 5

You are given two strings s1 and s2. Write a function isSubstring(char s1[], char s2[]) which takes two strings as input, and returns the start index if the second string is a substring of the first, else returns -1. (Case Insensitive)

Note: Print the result in the main() function.

Example

Input:

Starfish

Star

Output:

0

Input:

Starfish

Fish

Output:

4

Input:

Exhibition
habit
Output:
-1

Submission

Please submit your homework in piazza under hw4 folder and make it a private submission to the instructors. Zip all the codes and name the zip as yourname_rollno
Submission deadline is 8:00pm Jan 12.