<u>I</u>NSTRUCTIONS

1. ALL Four PROBLEMS are COMPULSORY

2. Carefully read all assignment problems.
3. Write only a single main function. You can call the required functions from the main function. Print the list of elements wherever necessary.
4.   Name the file as follows: **S2021xxxxx A01.c**

5.   DO NOT zip. Upload a single .c file directly to your submission in the common Google classroom.
6.   Don't share or copy the codes. If malpractice is found, you will be awarded Zero.

QUESTION 1:   2-Points

Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

1. Open brackets must be closed by the same type of brackets.

2. Open brackets must be closed in the correct order.

Example 1:

Input: s = "()"

Output: **true**

Example 2:

Input: s = "()[]{}"

Output: **true**

Example 3:

Input: s = "(]"

Output: **false**

Constraints:

- 1 <= s.length <= 10^4
- s consists of parentheses only '()[]{}'.

QUESTION-2   2-Points

Write a program to concatenate two linked lists?

Question-3   3-points

Your task is to construct a tower in N days by following these conditions:

- Every day you are provided with one disk of distinct size.
- The disk with larger sizes should be placed at the bottom of the tower.
- The disk with smaller sizes should be placed at the top of the tower.

The order in which tower must be constructed is as follows:

- You cannot put a new disk on the top of the tower until all the larger disks that are given to you get placed.

Print N lines denoting the disk sizes that can be put on the tower on the ith day.

Input format

- First line: N denoting the total number of disks that are given to you in the N subsequent days
- Second line: N integers in which the ith integers denote the size of the disks that are given to you on the ith day

Note: All the disk sizes are distinct integers in the range of 1 to N

Output format

Print N lines. In the ith line, print the size of disks that can be placed on the top of the tower in descending order of the disk sizes. If on the ith day no disks can be placed, then leave that line empty.

Constraints

- $1 \leq N \leq 10^5$
- $1 \leq size\ of\ a\ disk \leq N$

Sample Input	Sample Output
5 4 5 1 2 3	5 4 3 2 1

QUESTION-4   3-Points

N boys are sitting in a circle. Each of them has some apples in their hand. You find that the total number of the

apples can be divided by N. So you want to divide the apples equally among all the boys. But they are so lazy that each one of them only wants to give one apple to one of the neighbors at one step. Calculate the minimal number of steps to make each boy have the same number of apples (**Note: solve by considering heap sort algorithm**).

Input Format

The first line of input is an integer N. 2 <= N <= 10000 The second line is N integers indicating the number of apples of the ith boy. Each integer is positive and no more than 10^9.

Output Format

A single line contains the minimal number of steps to make each boy have the same number of apples.

Sample Input	Sample output
4 1 3 9 7	8