



Data Structure and Algorithm Training Program

Week 3: Practice Problems

Practice Problem Level : Easy

	Problem Description	Examples/Test Cases
Problem 1	Merge two sorted linked lists and return it as a new list. The new list should be made by splicing together the nodes of the first two lists.	Example 1: Input: 1->2->4, 1->3->4, Output: 1->1->2->3->4->4 Example 2: Input: NULL, NULL, Output: NULL Example 3: Input 1, NULL, Output: 1 Example 4: Input 1, 2, Output: 1->2
Problem 2	Implement Stack using two Queues Implement the following operations of a stack using queues. push(x) - Push element x onto stack. pop() - Removes the element on top of the stack. top() - Get the top element. empty() - Return whether the stack is empty.	Example: MyStack stack = new MyStack(); stack.push(1); stack.push(2); stack.top(); // returns 2 stack.pop(); // returns 2 stack.empty(); // returns false

Practice Problem Level : Medium

	Problem Description	Examples/Test Cases
Problem 3	Given a singly linked list, group all odd nodes together followed by the even nodes. Please note here we are talking about the node number and not the value in the nodes.	Example 1: Input: 1->2->3->4->5->NULL Output: 1->3->5->2->4->NULL Example 2: Input: 2->1->3->5->6->4->7->NULL Output: 2->3->6->7->1->5->4->NULL
Problem 4	Given a linked list and a value x, partition it such that all nodes less than x come before nodes greater than or equal to x. You should preserve the original relative order of the nodes in each of the two partitions.	Example 1: Input: head = 1->4->3->2->5->2, x = 3 Output: 1->2->2->4->3->5

Practice Problem Level : Difficult

	Problem Description	Examples/Test Cases
Problem 5	<p>You have n super washing machines on a line. Initially, each washing machine has some dresses or is empty.</p> <p>For each move, you could choose any m ($1 \leq m \leq n$) washing machines, and pass one dress of each washing machine to one of its adjacent washing machines at the same time .</p> <p>Given an integer array representing the number of dresses in each washing machine from left to right on the line, you should find the minimum number of moves to make all the washing machines have the same number of dresses. If it is not possible to do it, return -1.</p>	<p>Example 1: Input: [1,0,5] Output: 3 Explanation: 1st move: 1 0 <-- 5 => 1 1 4 2nd move: 1 <-- 1 <-- 4 => 2 1 3 3rd move: 2 1 <-- 3 => 2 2 2</p> <p>Example 2: Input: [0,3,0] Output: 2 Explanation: 1st move: 0 <-- 3 0 => 1 2 0 2nd move: 1 2 --> 0 => 1 1 1</p> <p>Example 3: Input: [0,2,0] Output: -1 Explanation: It's impossible to make all the three washing machines have the same number of dresses.</p>

Practice Problem Level : Difficult

Problem 6

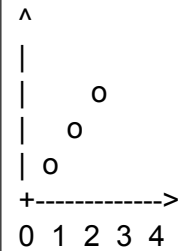
Problem Description

Given n points on a 2D plane, find the maximum number of points that lie on the same straight line.

Examples/Test Cases

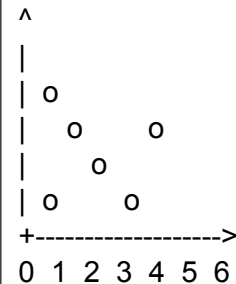
Example 1: Input: $[[1,1],[2,2],[3,3]]$ Output: 3

Explanation:



Example 2: Input: $[[1,1],[3,2],[5,3],[4,1],[2,3],[1,4]]$ Output: 4

Explanation:



Enjoy Algorithms!

Thank You.