《Backtracking》

1.

Given a string **A** and integer **B**, what is maximal lexicographical stringthat can be made from A if you do atmost B swaps.

2.

The set [1,2,3,…,n] contains a total of n! unique permutations.

By listing and labeling all of the permutations in order,  
We get the following sequence (ie, for n = 3 ) :

1. "123"

2. "132"

3. "213"

4. "231"

5. "312"

6. "321"

Given n and k, return the kth permutation sequence.

3.

The gray code is a binary numeral system where two successive values differ in only one bit.

Given a non-negative integer n representing the total number of bits in the code, print the sequence of gray code. A gray code sequence must begin with 0.

4.

Given a set of distinct integers, S, return all possible subsets.

5.

Given a set of candidate numbers (C) and a target number (T), find all unique combinations in C where the candidate numbers sums to T.

6.

Given two integers n and k, return all possible combinations of k numbers out of 1 2 3 ... n.

7.

Given a collection of integers that might contain duplicates, S, return all possible subsets.

8.

Given a digit string, return all possible letter combinations that the number could represent.

9.

Given a string s, partition s such that every string of the partition is a palindrome.

10.

Given n pairs of parentheses, write a function to generate all combinations of well-formed parentheses of length 2\*n.

11.

Given a collection of numbers, return all possible permutations.

12.

Given an integer n, return all distinct solutions to the n-queens puzzle.

Each solution contains a distinct board configuration of the n-queens’ placement, where 'Q' and '.' both indicate a queen and an empty space respectively.

13.

Write a program to solve a Sudoku puzzle by filling the empty cells.  
Empty cells are indicated by the character '.'

《Hashing》

14.

For Given Number N find if its **COLORFUL** number or not

**Return 0/1**

in order in an array and return the array from your function ( Looking at the function signature will make things clearer ). Note that, if no pair exists, return empty list.

If multiple solutions exist, output the one where **index2** is minimum. If there are multiple solutions with the minimum **index2**, choose the one with minimum **index1** out of them. Input: [2, 7, 11, 15], target=9 Output: index1 = 1, index2 = 2

15.

Find the largest continuous sequence in a array which sums to zero.

16.

Given an integer array ****A**** of size ****N**** containing ****0's**** and ****1's**** only.

You need to find the length of the ****longest**** subarray having count of 1’s ****one more**** than count of 0’s.

17.

Given an integer array ****A**** of size ****N****, find the first repeating element in it.

We need to find the element that occurs ****more than once**** and whose index of first occurrence is ****smallest****.

If there is no repeating element, return -1.

18.

Given an array S of n integers, are there elements a, b, c, and d in S such that a + b + c + d = target? Find all unique quadruplets in the array which gives the sum of target.

****Note:****

* Elements in a quadruplet (a,b,c,d) must be in non-descending order. (ie, a ≤ b ≤ c ≤ d)
* The solution set must not contain duplicate quadruplets.

19.

Given an array A of integers and another non negative integer k, find if there exists 2 indices i and j such that A[i] - A[j] = k, i != j.

20.

Given an 1D integer array ****A**** containing ****N**** distinct integers.

Find the number of unique pairs of integers in the array whose XOR is equal to ****B****.

21

Given an array of strings, return all groups of strings that are anagrams. Represent a group by a list of integers representing the index in the original list. Look at the sample case for clarification.

****Anagram :**** a word, phrase, or name formed by rearranging the letters of another, such as 'spar', formed from 'rasp'

22.

.Given an array A of integers, find the index of values that satisfy A + B = C + D, where A,B,C & D are integers values in the array

23.

A linked list is given such that each node contains an additional random pointer which could point to any node in the list or NULL.

24.

Given a string ****A**** consisting of lowercase characters.

Check if characters of the given string can be rearranged to form a ****palindrome****.

Return 1 if it is possible to rearrange the characters of the string ****A**** such that it becomes a palindrome else return 0.

25.

Given two integers representing the numerator and denominator of a fraction, return the fraction in string format.

If the fractional part is repeating, enclose the repeating part in parentheses.

26.

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

27.

Given a stream of numbers ****A****. On arrival of each number, you need to increase its first occurence by 1 and include this in the stream.

Return the final stream of numbers.

28.

Given an array of integers ****A**** and an integer ****B****.

Find the total number of subarrays having bitwise XOR of all elements equals to B.

29.

Given are Three arrays ****A****, ****B**** and ****C****.

Return the sorted list of numbers that are present in atleast 2 out of the 3 arrays.

30.

You are given a string, S, and a list of words, L, that are all of the same length.

Find all starting indices of substring(s) in S that is a concatenation of each word in L exactly once and without any intervening characters.

31.

Given an array of integers ****A**** and an integer ****B****.

Find the total number of subarrays having exactly B odd numbers.

32.

Given a string S and a string T, find the minimum window in S which will contain all the characters in T in linear time complexity.

33.

Given a string,   
find the length of the longest substring without repeating characters.

.《Heaps And Maps》

34.

****Max Heap**** is a special kind of ****complete binary tree**** in which for every node the value present in that node is greater than the value present in it’s children nodes.

Find the number of ****distinct Max Heap**** can be made from ****A distinct integers****.

In short, you have to ensure the following properties for the max heap :

* Heap has to be a complete binary tree ( A complete binary tree is a binary tree in which every level, except possibly the last, is completely filled, and all nodes are as far left as possible.)
* Every node is greater than all its children.

35.

Given two integers arrays ****A**** and ****B**** of size ****N**** each.

Find the ****maximum N elements**** from the sum combinations (Ai + Bj) formed from elements in array A and B.

36.

Given an 1D integer array ****A**** of size ****N**** you have to find and return the ****B**** largest elements of the array ****A****.

37.

Given an array ****A**** , representing seats in each row of a stadium. You need to sell tickets to ****B**** people.

Each seat costs equal to the number of vacant seats in the row it belongs to. The task is to maximize the profit by selling the tickets to B people.

38.

Given ****N**** bags, each bag contains ****Bi**** chocolates. There is a kid and a magician. In one unit of time, kid chooses a random bag ****i****, eats ****Bi**** chocolates, then the magician fills the ****ith**** bag with ****floor(Bi/2)**** chocolates.

Find the maximum number of chocolates that kid can eat in ****A**** units of time.

39.

Merge k sorted linked lists and return it as one sorted list.

40.

Given two equally sized 1-D arrays ****A, B**** containing ****N**** integers each.

A ****sum combination**** is made by adding one element from array ****A**** and another element of array ****B****.

Return the ****maximum C valid sum combinations**** from all the possible sum combinations.

41.

You are given an array of ****N**** integers, ****A1, A2 ,..., AN**** and an integer ****B****. Return the of count of distinct numbers in all windows of size ****B****.

Formally, return an array of size ****N-B+1**** where ****i'th**** element in this array contains number of distinct elements in sequence ****Ai, Ai+1 ,..., Ai+B-1.****

42.

Design and implement a data structure for LRU (Least Recently Used) cache. It should support the following operations: get and set.

《Tree Data Structure》

43.

You are given a preorder traversal ****A****, of a Binary Search Tree.

Find if it is a valid preorder traversal of a BST.

44.

Given a binary search tree, write a function to find the kth smallest element in the tree.

45.

Given a binary search tree ****A****, where each node contains a positive integer, and an integer ****B****, you have to find whether or not there exist two different nodes X and Y such that X.value + Y.value = B.

Return 1 to denote that two such nodes exist. Return 0, otherwise.

46.

Implement an iterator over a binary search tree (BST). Your iterator will be initialized with the root node of a BST.

The first call to next() will return the smallest number in BST. Calling next() again will return the next smallest number in the BST, and so on.

47.

Two elements of a binary search tree (BST) are swapped by mistake.  
Tell us the 2 values swapping which the tree will be restored.

48.

Given two integer array ****A**** and ****B****, you have to pick one element from each array such that their ****xor**** is ****maximum****.

Return this ****maximum xor**** value.

49.

Given a set of reviews provided by the customers for different hotels and a string containing ****Good Words****, you need to sort the reviews in descending order according to their ****Goodness Value**** (Higher goodness value first). We define the ****Goodness Value**** of a string as the number of ****Good Words**** in that string.

****NOTE:**** Sorting should be stable. If review ****i**** and review ****j**** have the same ****Goodness Value**** then their original order would be preserved.

You are expected to use Trie in an Interview for such problems

50.

Find shortest unique prefix to represent each word in the list.

51.

Given a binary tree denoted by root node ****A**** and a leaf node ****B**** from this tree.

It is known that all nodes connected to a given node ****(left child, right child and parent)**** get burned in 1 second. Then all the nodes which are connected through one intermediate get burned in 2 seconds, and so on.

You need to find the ****minimum time**** required to burn the complete binary tree.

52.

Given a binary tree, find its maximum depth.

The maximum depth of a binary tree is the number of nodes along the longest path from the root node down to the farthest leaf node.

53.

Given a binary tree containing digits from 0-9 only, each root-to-leaf path could represent a number.

An example is the root-to-leaf path 1->2->3 which represents the number 123.

Find the total sum of all root-to-leaf numbers % 1003.

54.

Given a binary tree and a sum, determine if the tree has a root-to-leaf path such that adding up all the values along the path equals the given sum.

55.

Given a binary tree, find its minimum depth.

The minimum depth is the number of nodes along the shortest path from the root node down to the nearest leaf node.

56.

Given a binary tree and a sum, find all root-to-leaf paths where each path’s sum equals the given sum.

57.

Given a binary tree

struct TreeLinkNode {

TreeLinkNode \*left;

TreeLinkNode \*right;

TreeLinkNode \*next;

}

Populate each next pointer to point to its next right node. If there is no next right node, the next pointer should be set to NULL.

Initially, all next pointers are set to NULL.

58.

Given a binary tree, return the zigzag level order traversal of its nodes’ values. (ie, from left to right, then right to left for the next level and alternate between).

59.

Given a binary tree, return the ****reverse level order traversal**** of its nodes values. (i.e, from left to right and from last level to starting level).

60.

Given a Binary Tree ****A**** consisting of ****N**** nodes.

You need to find all the cousins of node ****B****.

61.

Given a binary tree ****A**** of integers. Return an array of integers representing the ****right view**** of the Binary tree.

****Right view of a Binary Tree:**** is a set of nodes visible when the tree is visited from Right side.

62.

You are given the following :

* A positive number N
* Heights : A list of heights of N persons standing in a queue
* Infronts : A list of numbers corresponding to each person (P) that gives the ****number of persons**** who are ****taller**** than P and standing in front of P

You need to return list of actual order of persons’s height

63.

Given a binary tree, flatten it to a linked list in-place.

64.

Given a binary tree, return the Postorder traversal of its nodes values.。

65.

Consider lines of slope -1 passing between nodes.

Given a Binary Tree ****A**** containing ****N**** nodes, return all diagonal elements in a binary tree belonging to same line.

66.

Given a binary tree ****A**** consisting of ****N**** nodes, return a 2-D array denoting the vertical order traversal of ****A****.

Go through the example and image for more details.

67.

Find the lowest common ancestor in an unordered binary tree given two values in the tree.

68.

Given two binary trees, write a function to check if they are equal or not.

Two binary trees are considered equal if they are structurally identical and the nodes have the same value.

Return 0 / 1 ( 0 for false, 1 for true ) for this problem

69.

Given a binary tree, check whether it is a mirror of itself (ie, symmetric around its center).

70.

Given inorder and postorder traversal of a tree, construct the binary tree.

71.

Given preorder and inorder traversal of a tree, construct the binary tree.

72.

Given an array where elements are sorted in ascending order, convert it to a height balanced BST.

73.

Given an inorder traversal of a cartesian tree, construct the tree.

74.

Find shortest unique prefix to represent each word in the list.