Tutorial and Assignment Sheet – ODD 2022

15B11CI311 – Data Structures

Week 7 (26 Sep- 01 Oct, 2022)

Q.1. From a Time Table implemented using Array of List in given Fig 1, what change is required to add faculty name, room number, batches [Assuming to have one slot/node at one time interval]. After the change is done answer following queries

a. Is faculty named "SHS" free on sat between 12-2?

b. When is B9 batch available on Saturday?

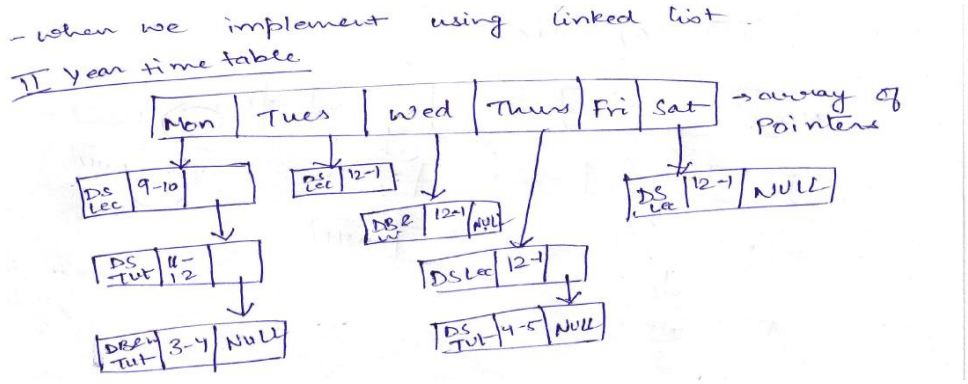
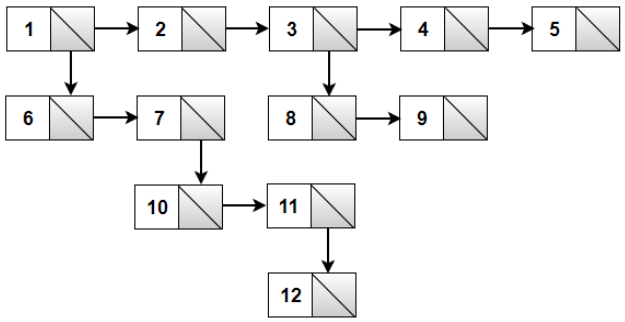


Fig 1

Q.2. Write pseudo code to Flatten the below Multilevel list row-wise and column-wise



Q.3. How do you count the number of leaf nodes in a given binary tree?

Q.4. Given a Binary Tree. Check whether all of its nodes have the value equal to the sum of their child nodes.

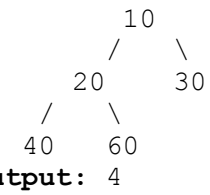
Q.5. The diameter of a tree (sometimes called the width) is the number of nodes on the longest path between two end nodes. The diagram below shows two trees each with diameter nine, the leaves that form the ends of the longest path are shaded (note that there is more than one path in each tree of length nine, but no path longer than nine nodes).

Input:

```
        1
      /   \
    2       3
```

Output: 3

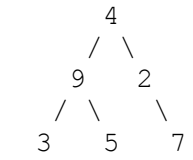
Input:



Output: 4

Q.6. Given a binary tree, find the largest value in each level.

Input :



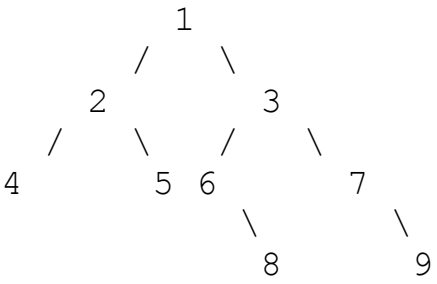
Output : 4 9 7

Explanation :

There are three levels in the tree:
1. {4}, max = 4
2. {9, 2}, max = 9
3. {3, 5, 7}, max=7

Q.7. Given a Binary Tree, find the **vertical traversal** of it starting from the leftmost level to the rightmost level. If there are multiple nodes passing through a vertical line, then they should be printed as they appear in level order traversal of the tree.

Input:



Output:

4 2 1 5 6 3 8 7 9