Data Structures Lab – ODD 2021 (due to Covid19, running in Special Semester 2021)

Lab Test 1

Max Time: 45 Minutes

Max Marks: 20

Set A (Students having ODD Enrolment Number will attempt Set A)

Q1. [6 Marks] [CO2] You have been given a matrix with M rows and N columns. Elements in each row of the given matrix are arranged in sorted (ascending) order. For any K (where K < M × N), it is desired to find out the Kth smallest element in the given matrix. Propose and implement an efficient scheme.

Q2. [14 Marks] [CO4] There are at most two children of a node in a binary tree and we call a binary tree as FULL, if every non-leaf (intermediate) node has exactly two children. Let's consider the Pre-order traversal of a FULL binary tree (FBT) as follows (information in these nodes are characters):

A B D H I E J K C F L M G N O

Write a program to reconstruct the FBT from given Pre-order traversal. To check, whether you have created the correct FBT or not, traverse the reconstructed FBT using In-order traversal.

Set B (Students having EVEN Enrolment Number will attempt Set B)

Q1. [6 Marks] [CO2] You have been given a matrix with M rows and N columns. Elements in each row and each column of the given matrix are arranged in sorted (ascending) order. For any K (where K < M × N), it is desired to find out the Kth smallest element in the given matrix. Propose and implement an efficient scheme.

Q2. [14 Marks] [CO4] There are at most two children of a node in a binary tree and we call a binary tree as FULL, if every non-leaf (intermediate) node has exactly two children. Let's consider the Post-order traversal of a FULL binary tree (FBT) as follows (information in these nodes are characters):

H I D J K E B L M F N O G C A

Write a program to reconstruct the FBT from given Post-order traversal. To check, whether you have created the correct FBT or not, traverse the reconstructed FBT using In-order traversal.