National University

of Computer & Emerging Sciences Peshawar Campus

Name: _____ Roll No: _____

Program: CS
Semester: Spring - 2020
Time Allowed: 6 hrs.
Course: Data Structures Lab

Examination: Lab Exam
Total Marks: 50
Date: 19 h June, 2020
Lab Instructor: Muhammad Hamza

Instructions:

1. **Read all the instructions carefully.**
2. **Only submit source files and image files without enclosing it in any folder or zip file.**
3. **Plagiarism will not be tolerated and will be given straight 0 to anyone involved.**
4. **The exam is based on analytical and logical skills, so it's part of the exam to understand all the requirements on your own.**
5. **Score will be based on your creativity and working program.**
6. **All the submissions should be made on the slate only.**
7. **Please keep time limits in mind and try to submit the exam 15 min before end time.**

1. Suppose we have an array of size 26 filled with english alphabets and is sorted in ascending order. It looks like A,B,C,D,E,....,Z. Write an algorithm to unsort the array. Make sure that the unsorted list doesn't contain sub sorted lists of size greater than 2.
   e-g X,A,R,T,G,L,M,N,E,W,E,Q,.... (this unsorted list contains a sub sorted list L,M,N which has size greater than 2, such sorted lists within unsorted list are not allowed) but it's ok to have a sorted list of size 2 within unsorted list e-g X,A,R,T,G,L,M,E,W,E,Q,.... (L,M is a sorted list of size 2 which is allowed).

   Your solution should be creative.

2. Take the unsorted list from Q1 and insert all it's elements 1 by 1 in a binary tree, now take out all the elements from the root of the tree one by one and add them to the list again, once the array is full it should be sorted again. i-e A,B,C,D,E,F,G,.....,Z.

Good Luck :)