Lahore University of Management and Sciences

Final Exam Manual

for

Introduction to Programming

(CS200)

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EXAM GUIDELINES

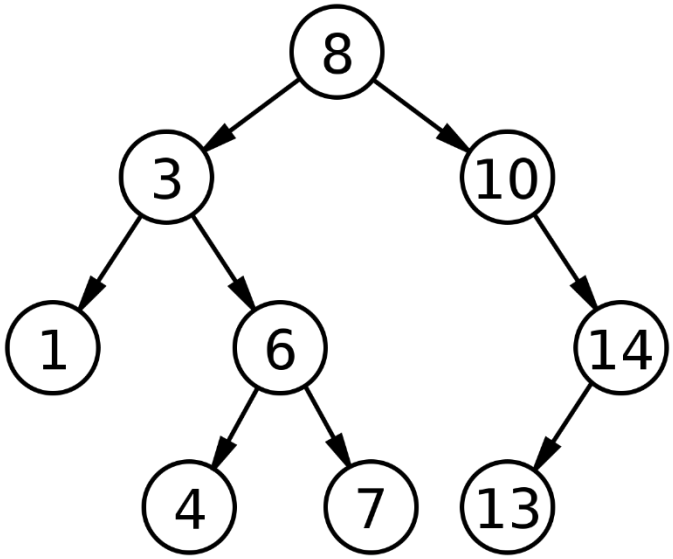
- Make sure you submit the exam before 11:45 AM. Any late submission will not be graded afterwards.
- There will be a folder created on LMS. You must submit your work in the respective folder during the assigned time. You and only you are responsible for your submissions.
- You should do your work with utmost clarity and precision. Do not waste your time trying to do something you do not understand.
- Any legitimate cheating case can and will be reported to Disciplinary Committee without any leniency. Plagiarism software(s) make our task easier.
- Please follow the exam etiquettes and follow code of conduct in the session.
- **Rename the provided tree.cpp files to this naming convention: YourRollNumber_FinalExam.cpp. Submit the .zip file only! (no .rar file submissions).** Failure to follow the naming convention may lead to deduction of marks.

Question # 1 [Marks: 40] **Est. Time: 60 mins**

NOTE: You have been provided with a tree.cpp file. You have to **implement the following tasks in the specified sections** in that file **ONLY**. **NO changes should be made to the rest of the code provided.**

In this task, you will be working with binary trees

Your task is to implement the following two functions in the file named "tree.cpp"



a) int maxDepth(node*):
This function calculates the height / max depth of the tree when the root node is passed as the parameter to the function. We'll assume that there are no duplicates in the binary tree. **(20)**

Input: node with value 8
Return: The height of the given tree is 3

Input: node with value 14
Return: The height of the given tree is 1

b) string givePath(int input_value):
Here, you have to trace the path to a node with value = input_value, starting from the root node. We'll assume that there are no duplicates in the binary tree. In case the path does not exist, return "Path DNE" **(20)**

Input: 7
Return: "8-> 3-> 6-> 7"

Input: 15
Return: "Path DNE"

Total marks: 20 + 20 = 40

NOTE: For the two functions

that you are required to make, there will be binary marking for them. We have designed test cases to check your implementation for correctness and these test cases return either 0 (in case of errors) or 20 (in case everything works perfectly fine).

Best of Luck!