DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CSE207 (DATA STRUCTURES AND ALGORITHMS II)

Assignment 1 (Due Date: Nov 15, 2020) Total Marks: 20

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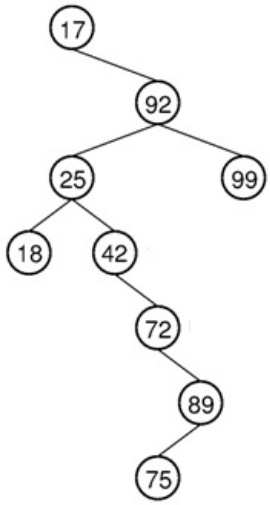
1. Given an AVL tree, prove that at most one rotation (either single or double) is required to balance the tree for the 'Insert' operation. **5**

2. Given an AVL tree, show by example that more than one rotation might be necessary to keep the tree balanced after the 'Delete' operation. **5**

3. What is meant by amortized running time of an algorithm? Why a splay tree has $O(\log n)$ amortized running time per operation? **4**

4. Consider a search for value 89 in the splay tree of the figure shown below. How many rotations are required in this example? Draw the *resulting trees* after each rotation. **6**



Submission Guidelines:

a) Write your answers on A4 size white paper. Typed answers are not acceptable.

b) Write your Student No. and Name on each page. Also write Page No. on each page.

c) Prepare a .pdf file, and the name of your .pdf file must be your 7-digit Student No.

d) Upload your hand-written answer (.pdf file) to a link provided to CSE Moodle site.

Deadline:

Deadline is set on 15 November, 2020 (Sunday) at 11:55 pm.