PRACTICAL EXAM [1] – CSD201 – SUMMER 2023
Duration: 85 minutes

Write a Java project that manages **lecturer** (**lecturer_code**: int, **teaching_hours**: int) on a **binary search tree** (ordered based on lecturer_code) **T** with the following requirements. Given the array of lecturer information, called **A**: (5, 55), (3, 33), (2, 22), (4, 44), (7, 77), (6, 66), (8, 88), (1, 11), (9, 99).

1. To obtain the tree from A *[constructor, (*+lecturer*) 2.5]*.
2. Count the number of levels using a breadth-first search *[num_level, 1.0]*.
3. Get the information of the lecturer having the maximum teaching hours *[peek_max_mark, 1.0]*.
4. Using a recursion to traverse by in-order and store the result to array Ain *[in_order_recur, 1.0]*.
5. Using an linked-list-based stack to traverse by pre-order and store the result to array Apre *[pre_order_list_stack, 1.0]*.
6. Comprise BST T2 from 2 arrays of Ain and Apre with a recursion *[comprise_in_pre, 1.0]*.
7. Sort A in increasing order by InsertionSort and determine whether A is equal with Ain *[insert_equal, 0.75]*.
8. A main function to test all requirements *[1.75]*!

Note: Submit java files only!