Data Structures & Algorithms
Lab 3: Trees & Recursion

Due on first session of lab 4 for your group

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Handing In

This lab should be completed and shown during the first session of lab 4 for your group. The TA will pass by your seat and evaluate each exercise. Upon successful completion of the lab, for each lab exercise, please provide a text file named ex_n.txt with the following content:

- indicate which file(s) implement the algorithm and/or data structure in the exercise;
- a brief explanation of the tests that were carried out to test the implementation;
- instructions on how to execute a test to verify the implemented code;
- answers to any theoretical questions asked in the exercise. Please submit all lab material collected into an archive (zip, rar, or tar.gz) via a Blackboard message to João Salvado and Federico Pecora.

Exercise 1 — Binary Trees

- Implement a binary tree and provide all of the dynamic set operations (as listed in the book on page 230).
- Add functions to compute the depth and size of tree.
- Write tests for each operation to show that it works as intended.
- Use your binary tree implementation to realize an algorithm that, given a set of numbers, prints them out in sorted order.

Exercise 2 — Testing (I)

Test the program on the sorting problems provided for Lab 1.

Exercise 3 — Testing (II)

Once you have completed the lab, test an exercise of a colleague and report which tests you conducted and the results of these tests.