**Homework # 5**

**Comparison of searching trees: BST, AVL and B-tree.**

Write a program for empirical comparative analyses of searching algorithms**BST, AVL and B-tree of order 7**. The program has to do the following:

* Generate ***vector***s with random integer numbers, with different size: 1000, 10 000, 20 000 (generate five different ***vectors*** for every size);
* Modify the functions implementing the three searching algorithms in a way to count the number of comparisons (for B-tree count separately comparisons within nodes and moving from one node to another - jumps) ;
* Apply the three searching algorithms to the **same *vector*** to build the three and count the number of steps (count moves to next node in the three and creation of a new node) to insert all numbers.
* Calculate the average number of steps for each algorithm according the results obtained by the five, randomly generated, vectors.
* Present the results in a table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | BST | AVL | B-tree; M=7 | |
| Within nodes | Jumps |
| 1000 |  |  |  |  |
| 10 000 |  |  |  |  |
| 20 000 |  |  |  |  |

**Delivery:**

**Electronic version:  all program files.**

**Hard copy:**

**(1)**     **source code of the function, that generates random numbers;**

**(2)**     **source code of functions (e.g. main) that calls functions implementing the search algorithms;**

**(3)**     **source code of the function (could be the same) that calculates statistics.**

**(2) result table**

**(3) analysis of results, including conclusion regarding whether the results support the theory?**