Technische Universität München
Institut für Informatik
Theoretical Computer Science

WS 2015/16
Worksheet 6
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Fundamental Algorithms 6

K-Exercise 1

Write an algorithm that copies all keys that are stored in a binary search tree into an array of appropriate size. In the resulting array, the keys shall be sorted in descending order.

K-Exercise 2

Consider the binary tree given by the expression

```
x = (5, (3, emptyTree, (4, emptyTree, emptyTree)),
     (8, (6, emptyTree, emptyTree), (10, (9, emptyTree, emptyTree),
     (13, emptyTree, emptyTree))))
```

- draw a diagram of this binary tree and decide whether its a binary search tree
- perform the following operations (using the resp. algorithms from the lectures), and draw a diagram of the search tree after each operation:
  - `TreeInsert(x,11)`
  - `TreeDelete(x,5)`
  - `TreeInsert(x,5)`
  - `TreeInsert(x,12)`

K-Exercise 3

Decide whether the binary tree given in Exercise 2 is an AVL tree

- before the insert/delete operations, and
- after each of the regular insert/delete operations.

Again, perform the insert/delete operations given in exercise IV, and name and perform the rotation(s) to restore the AVL property after each step (if required). Draw a diagram of the search tree after each of your insert/delete, or rotation operations.