PL 68
00014 HELSINGIN YLIOPISTO

Exercise 4 (18–22.10.2004)

1. Analyze the Θ-notation based time and space complexity of following program:

   compute(k)

   Where the procedure compute is defined as follows:

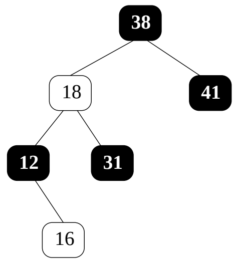
```
compute(m)
    if m $\leq$ 1 then return
    x ←0
    for i ←1 to k do
        x ←x+1
    print(x)
    compute(m/2)
```

2. Design and implement (in pseudocode) operation **list-merge(L1,L2)**

   - as input two linked lists $L1$ and $L2$
   - within a list, elements are in ascending order
   - operation merges two lists to one, where all elements are in ascending order
   - after operation $L1$ becomes the merged list
   - after operation $L2$ is empty

   What is time/space complexity of operator?

3.



   (a) remove 38 from the tree in above figure
   (b) remove 18 from the tree in above figure
   (c) add firstly 43 and then 45 to the tree in above figure
   (d) remove 38 from the tree resulting in part (*c*)
   (e) remove 42 from the tree resulting in part (*d*)

   Draw tree after each insertion/deletion and show what fixup-operation has the been used.