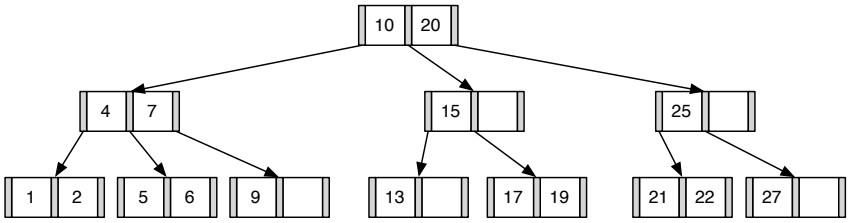
TU München, Fakultät für Informatik
Lehrstuhl III: Datenbanksysteme
Prof. Alfons Kemper, Ph.D.

Exercise for *Database System Concepts for Non-Computer Scientist* im WiSe 18/19

Alexander van Renen (renen@in.tum.de)
http://db.in.tum.de/teaching/ws1819/DBSandere/?lang=en

Sheet 12

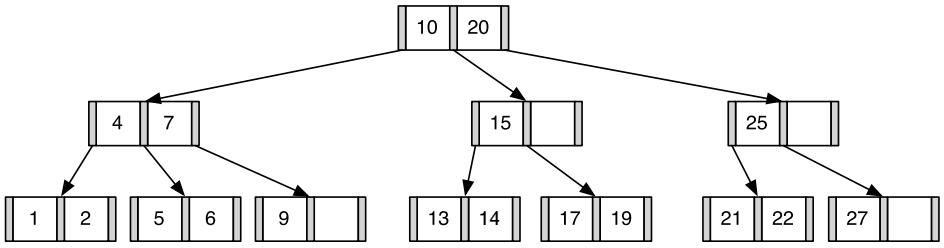
Exercise 1



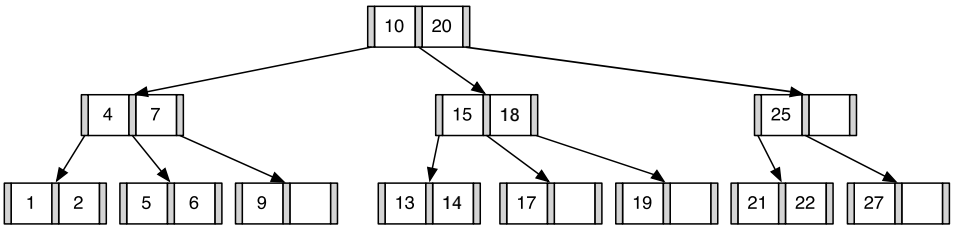
Insert 14, 18 and then 3 into the depicted B-Tree (degree $i = 1$).

Solution:

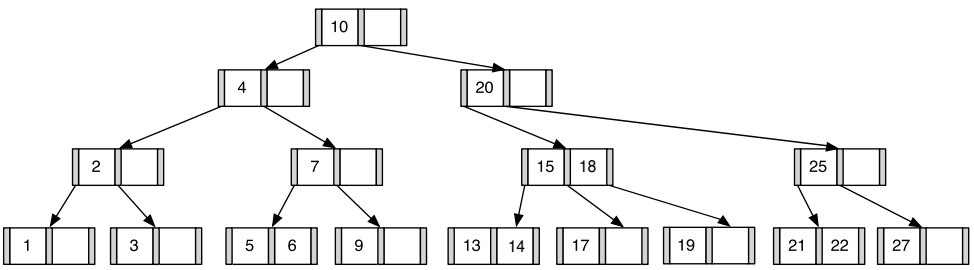
After inserting 14:



After inserting 18:



After inserting 3:



Exercise 2

Give a permutation of the numbers 1 to 24, such that when inserted into an empty B-Tree (degree $i = 2$) the height of the tree (number of layers) of the B-Tree is minimal. Draw the resulting tree.

Solution:

To be of minimal height. The resulting root of the tree must contain 5,10,15 and 20.
On possible option is the following:

- 1,2,5,6,7: a new root containing 5 is created
- 10,11,12: 5 and 10 are in the root node now
- 15,16,17: 1,10 and 15 are in the root node now
- 20,21,22: 1,10,15,20 are in the root node now
- Now, we can insert the remaining keys in an arbitrary order