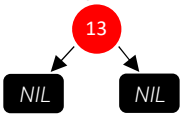
ADS Homework 10

Name - Tewodros Adane
Email - tadane@jacobs-university.de

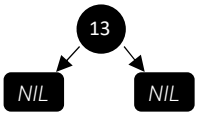
Problem 10.1 – Understanding Red Black Trees

a) Inserting the values [13, 44, 37, 7, 22, 16] in this order into a Red Black Tree will have the following steps:

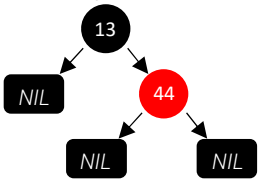
Inserting 13:



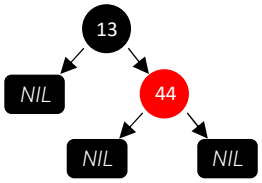
Fix up:



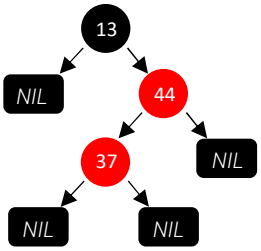
Inserting 44:



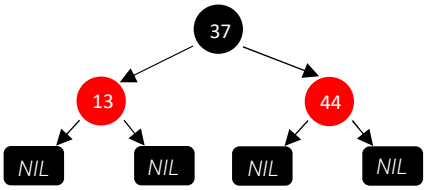
Fix up:



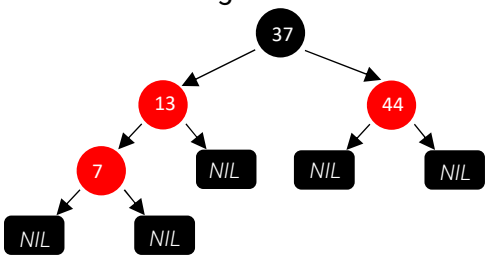
Inserting 37:



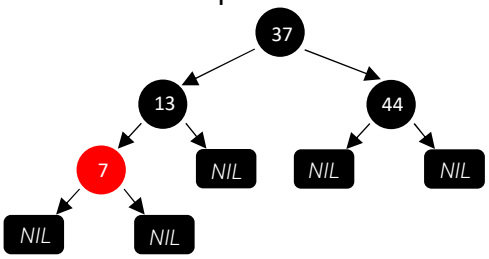
Fix up:



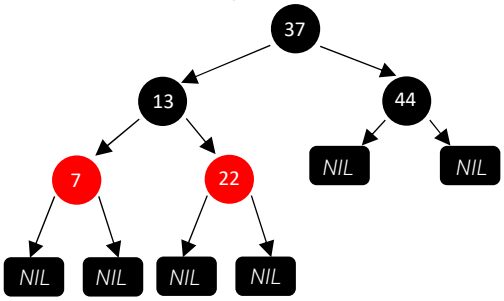
Inserting 7:



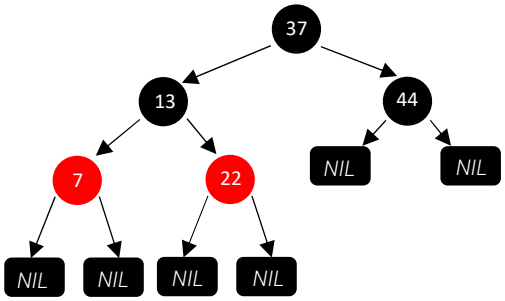
Fix up:

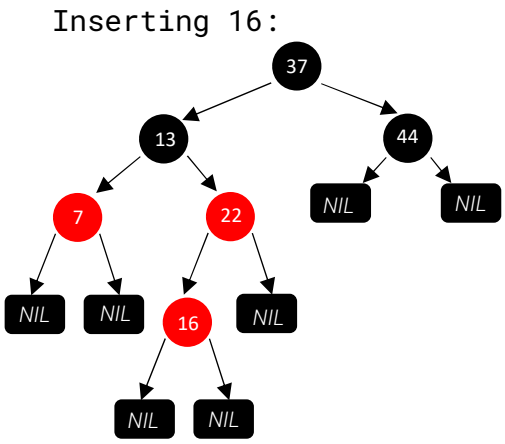


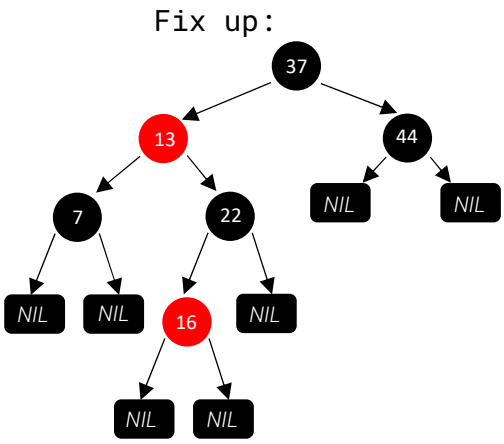
Inserting 22:



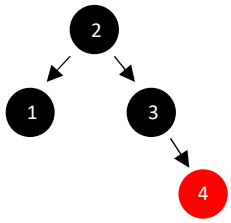
Fix up:

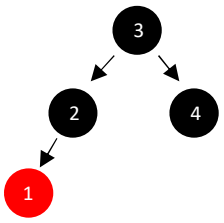


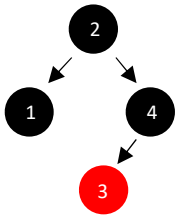


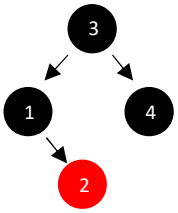


b) There are only four possible ways that [1, 2, 3, 4] can be represented in a Red black tree:









Problem 10.2 – Implementing Red Black Trees

The template implementation of a Red Black tree is in the file "*RedBlackTree.h*", and the usage is in "main.*cpp*".