

# ADS Homework 9

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## 1 Problem 9.1

### 1.1

The required step by step drawing of the Red-Black Tree is as follows;

Insert first num: 13 in red



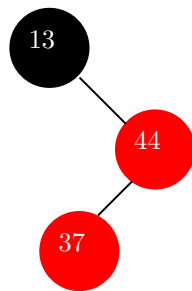
Fix Color



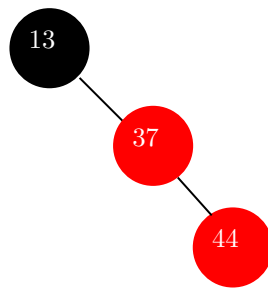
Insert next num: 44



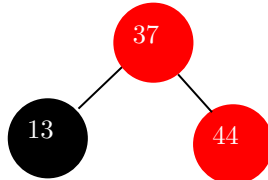
Insert next num: 37



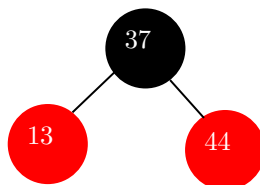
⇓ Rotate 44 to right

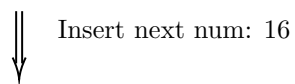
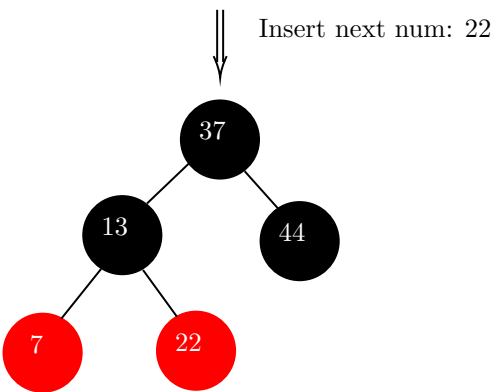
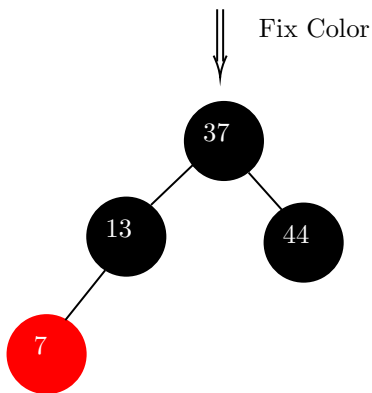
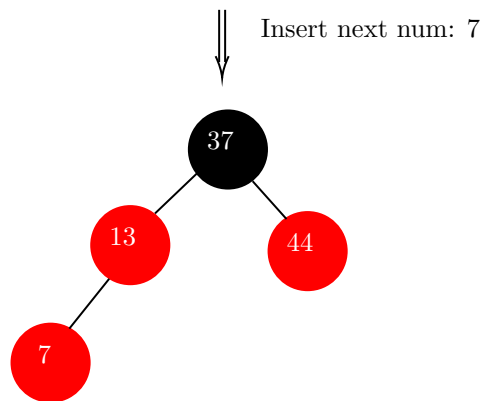


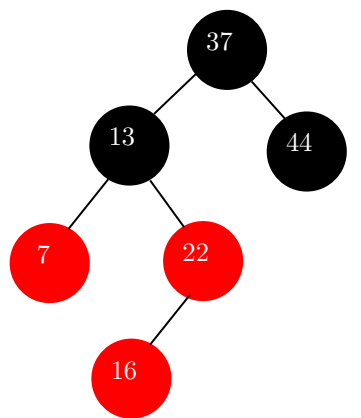
⇓ Rotate 13 to left



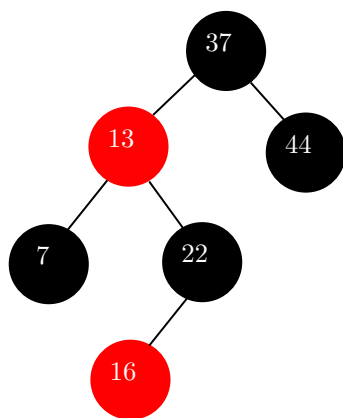
⇓ Fix Color





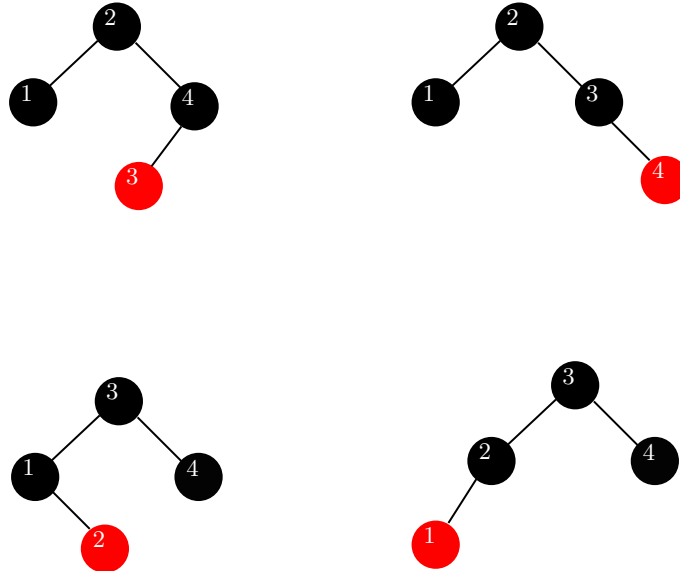


Fix Color



## 1.2

The possible red-black trees that stores the value 1,2,3,4 are as follows:



## 2 Problem 9.2

Please check the attached files rbt.cpp, rbt.h and testrbt.cpp.