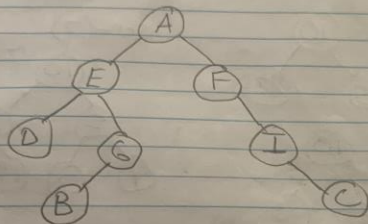


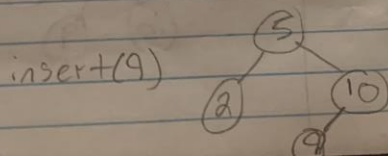
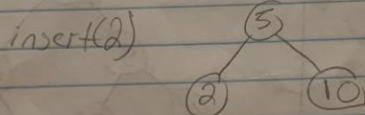
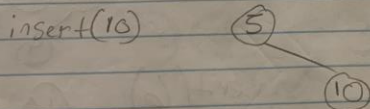
Homework #2 CptS 233

Tanner Crane
HW 2
CptS 233

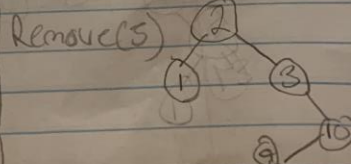
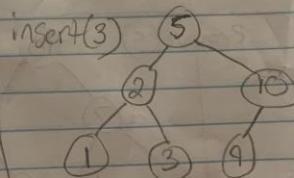
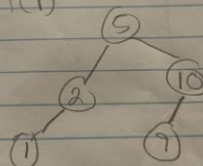
- ① Pre-order: A, E, D, G, B, F, I, C
In-order: D, E, B, G, A, F, I, C



- ② Step 1
↓ insert(5)
← root



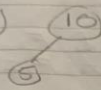
insert(1)



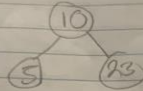
③ insert(10)



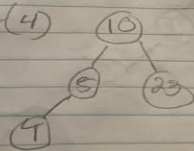
insert(5)



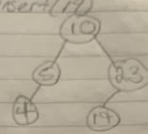
insert(23)



insert(4)



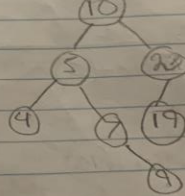
insert(12)



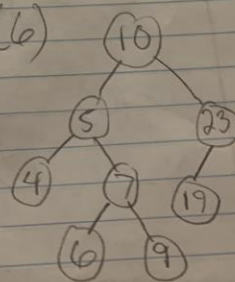
insert(7)



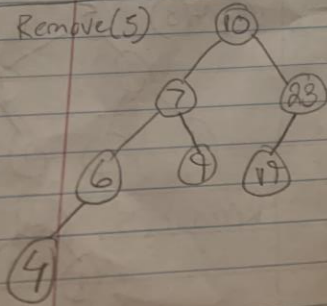
insert(9)



insert(6)



Remove(5)



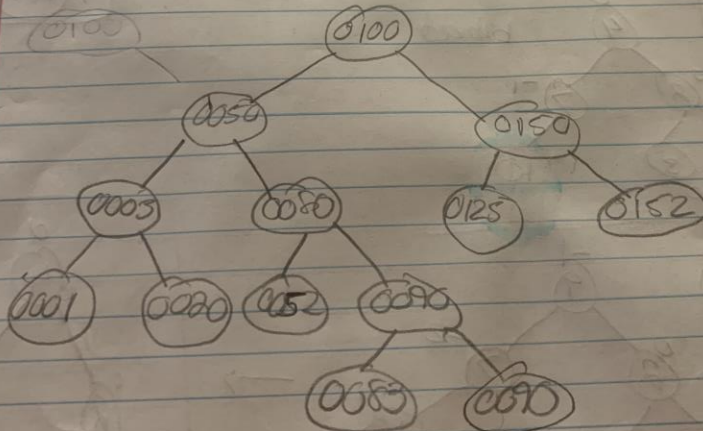
- 4) A) height == 4 (node)
 B) depth == 4 (090)
 C) height == 4

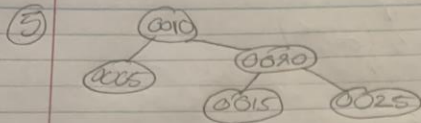
D) Pre-order:

0100, 0050, 0003, 0001, 0080, 0052, 0090,
 0083, 0099, 0150, 0125, 0152

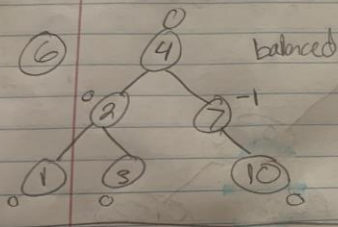
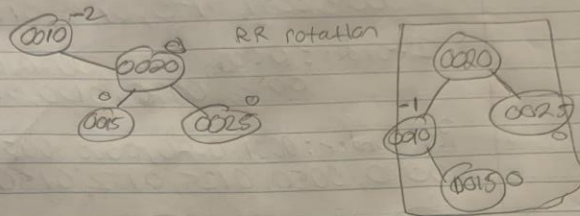
In-order: 0001, 0003, 0020, 0050, 0052, 0080,
 0083, 0090, 0100, 0125, 0150, 0152

Post-order: 0001, 0020, 0003, 0052, 0083, 0099, 0090,
 0080, 0050, 0125, 0152, 0150, 0100



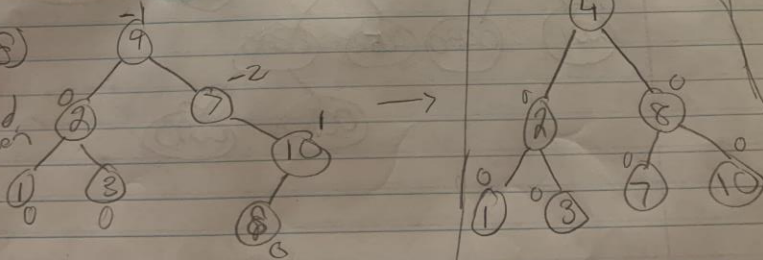


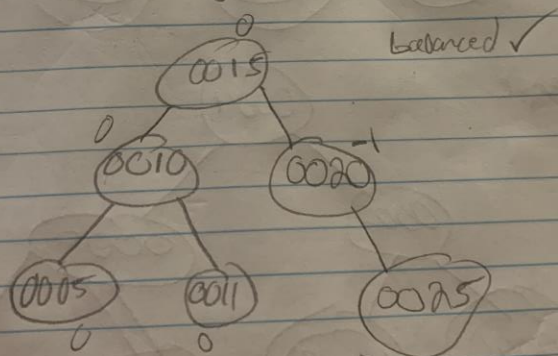
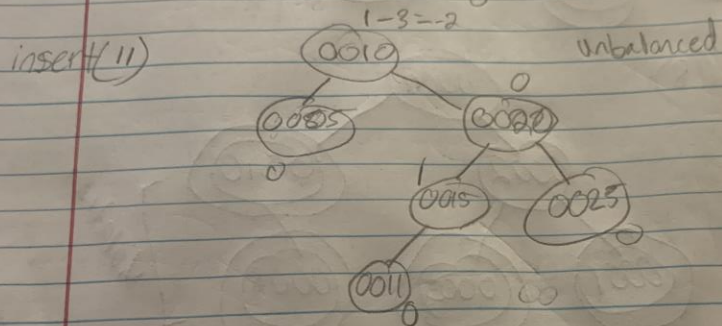
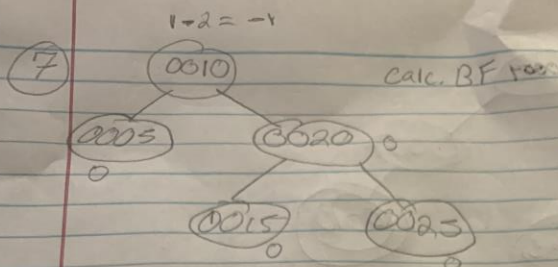
remove 5



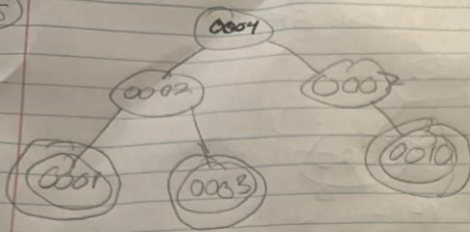
insert(8)

unbalanced
RL rotation

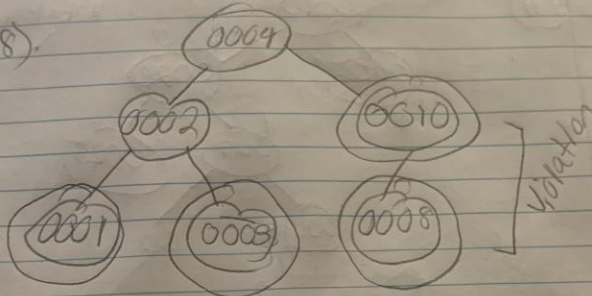




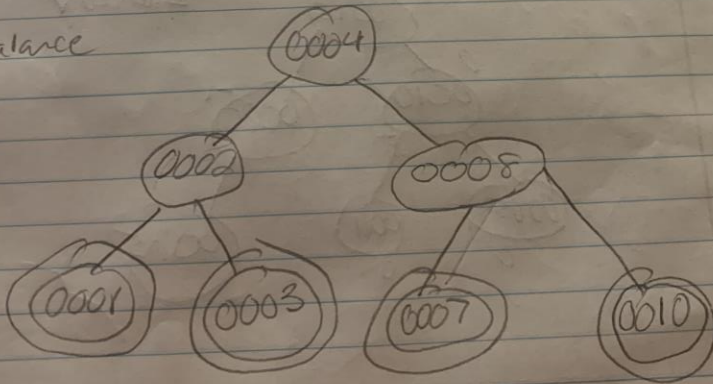
5

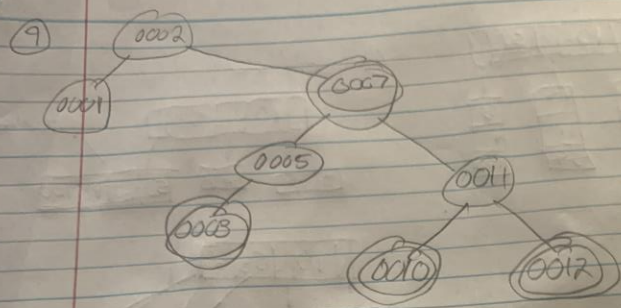


insert(8).

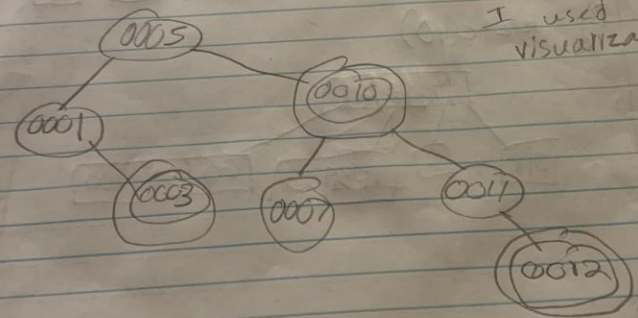


rebalance



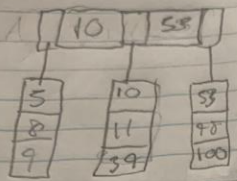


deleted2)

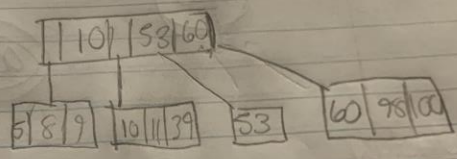
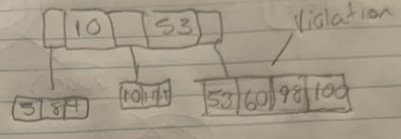


I used data visualization tool.

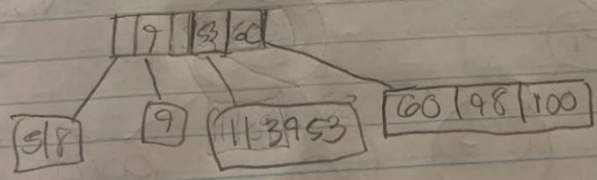
10



A) insert 60



B) delete(10)



11) A) size of internal nodes $M=3$

B) Leaf nodes $[L=6]$

* Int nodes show which place the data is stored. So from the given visualization we can see $L=6$

1) How tall (on Avg.) will our tree be?

at 85 height = 1
25-125 height = 2
125-625 height = 3
625-3125 height = 4

Avg. $n = 5^m < N \leq 5^{m+1}$ height = $m+1$

2) 30,000 records:

$5^6 < 30,000 \leq 5^7$
 $15625 < 30,000 \leq 78125$

* In this given interval the height = 6

3) 2,500,000 records:

$5^9 < 2,500,000 \leq 5^{10}$
 $1,953,125 < 2,500,000 \leq 9,765,625$

* In this given interval the height = 9