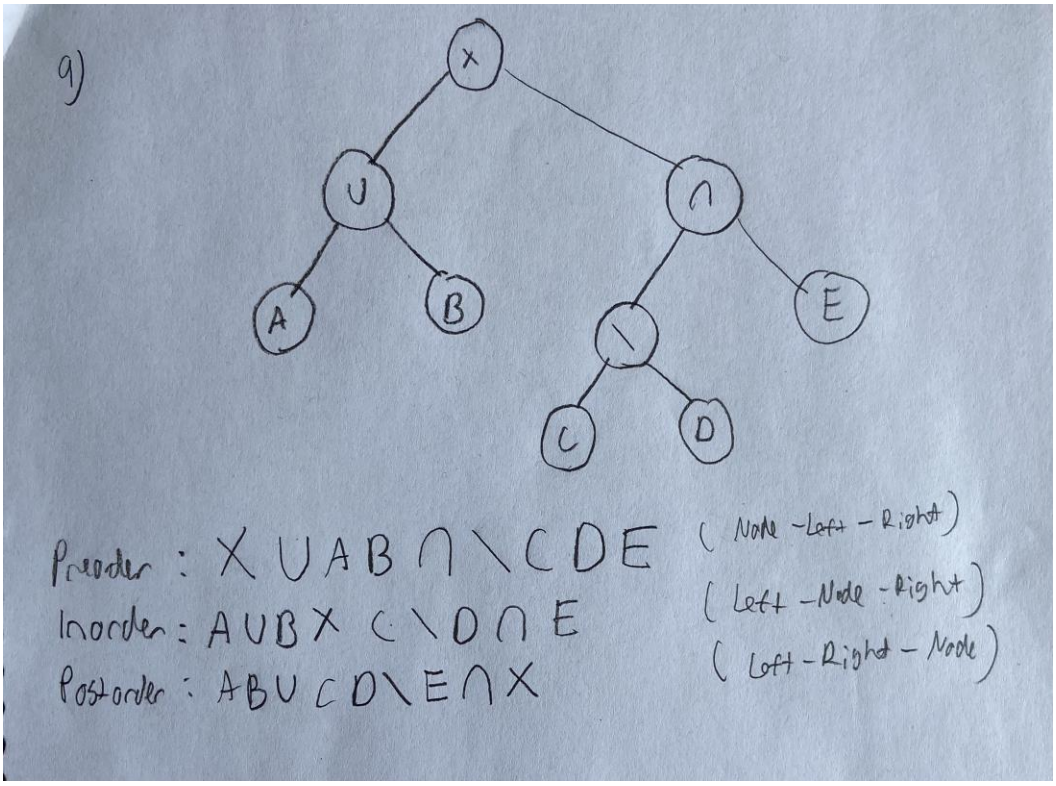
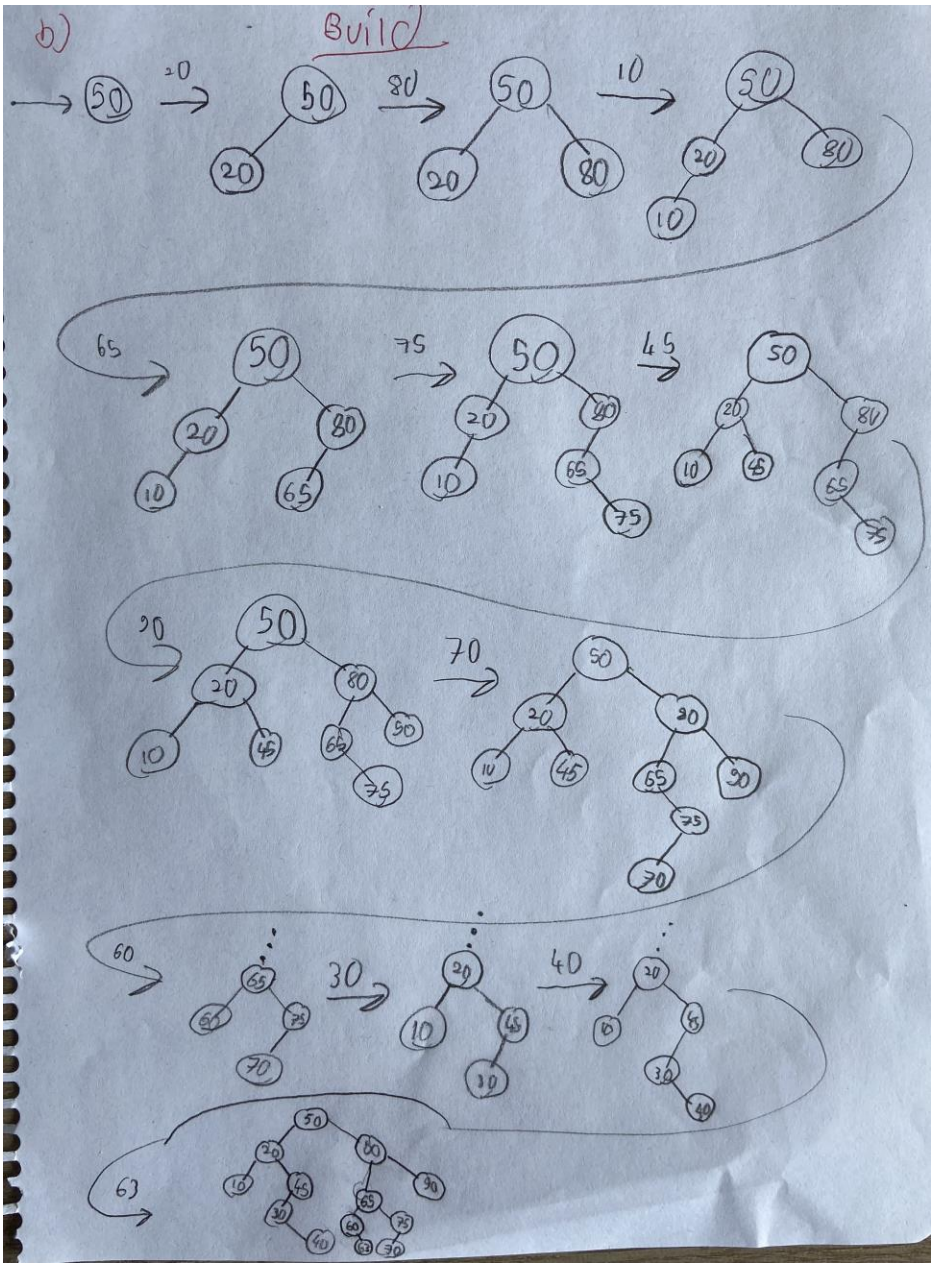
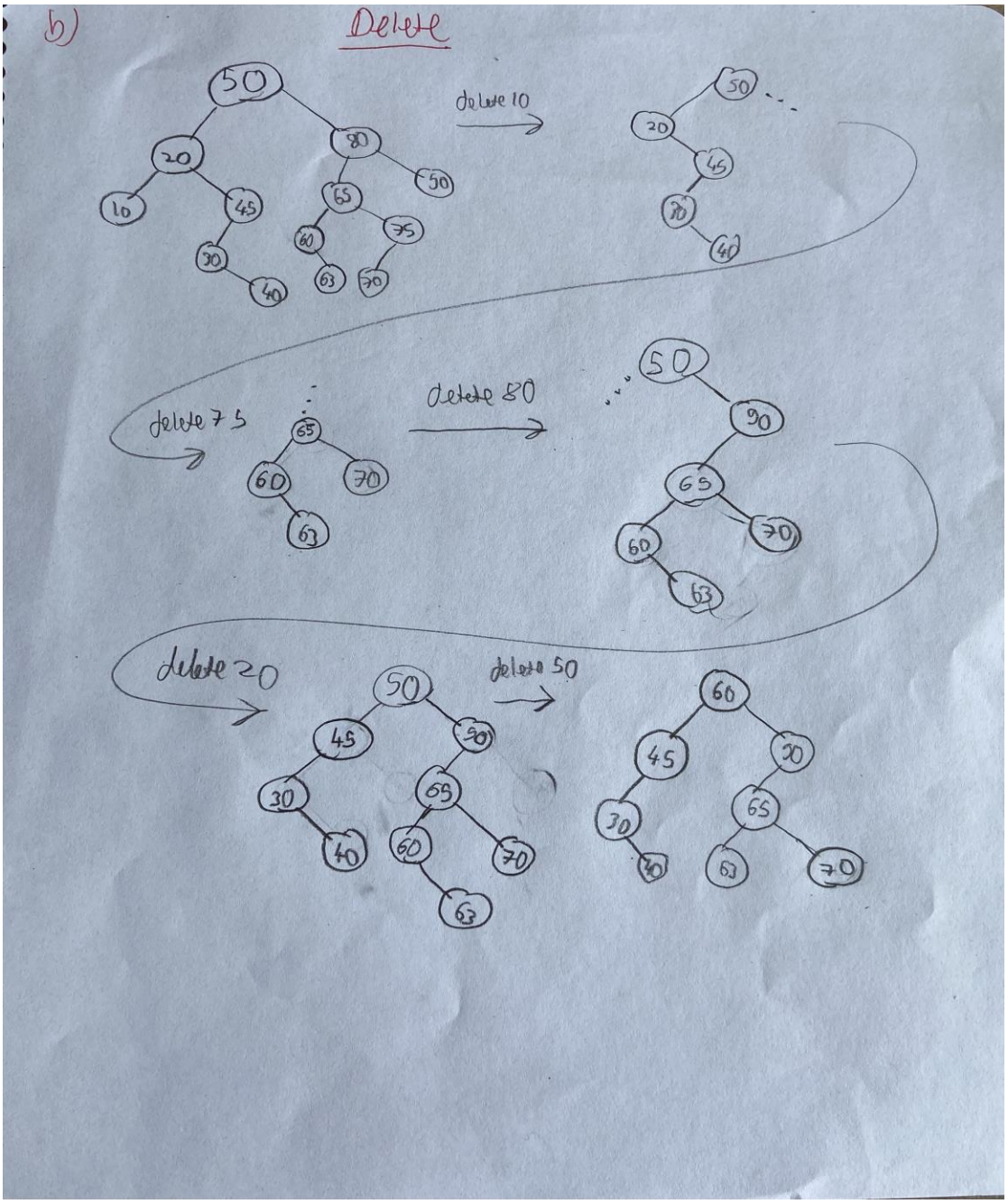
CS202-HW2(Utku Kurtulmus-21903025)(Sec1)

Question 1




b)
Build
50
20
80
10
65
75
45
90
70
60
30
40
63

b) Delete

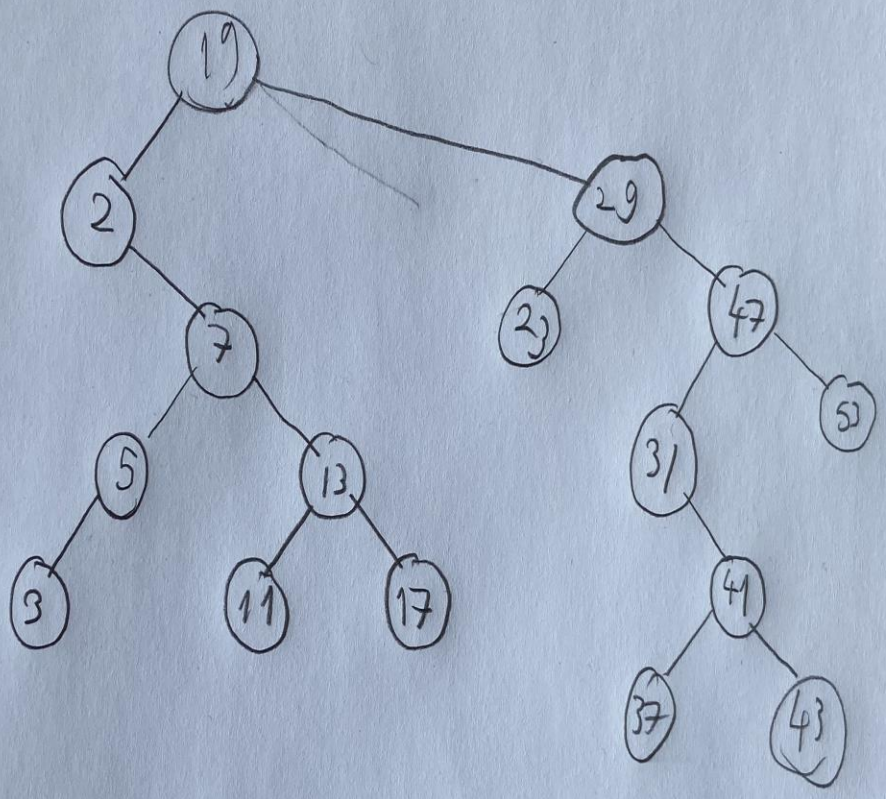

50
20
80
10
45
65
50
30
60
75
40
63
70
delete 10
50
20
45
30
40
delete 75
65
60
70
63
delete 80
50
30
65
60
70
63
delete 20
50
45
30
65
40
60
70
63
delete 50
60
45
30
30
65
40
63
70

c) left child

3, 5, 11, 17, 13, 7, 2, 23, 37, 43, 41

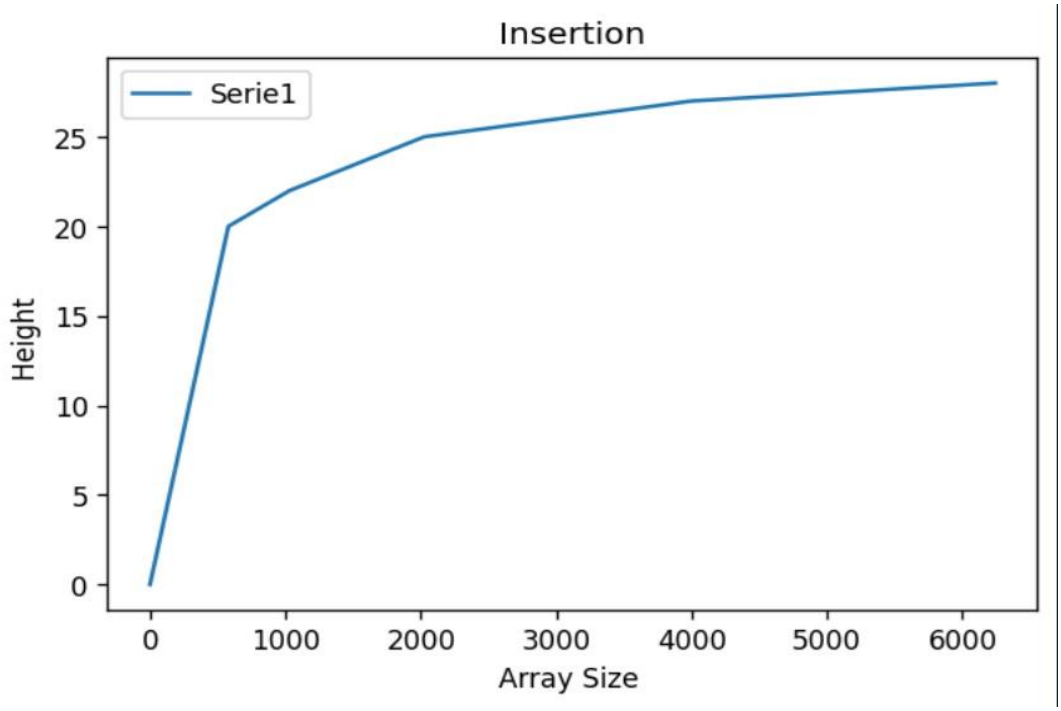
31, 53, 47, 29, 19. Postorder

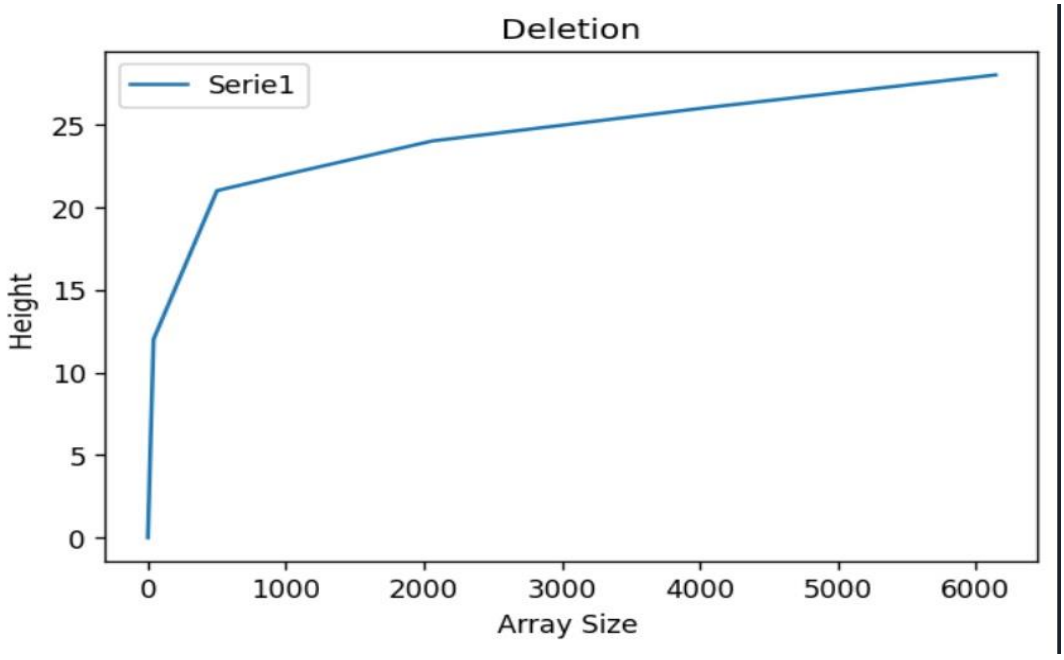
Since this is a post order 19 is the root



Preorder: 19, 2, 7, 5, 3, 13, 11, 17, 29, 23, 47, 31, 41, 37, 43, 53

Question 3


Insertion
Serie1
Height
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Array Size


Deletion
Serie1
Height
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Array Size

Comments on plots: I didn't include results of other executions since they are almost perfectly identical and on graph they overlap and it's not a good idea to put them together on graph. And I think this homework was really useful for us to understand the behavior of a binary search tree. We knew that in the worst case (sorted) binary search tree, the height is n (number of elements) and in best and average cases height is approximately log(n). We can see this relation on the plots. Moreover, in timing analysis there are various types of parameters that can change the result, but in height analysis we see almost perfectly identical results on different environments, and the theoretical and experimental results match.