Algorithm Analysis and Data Structures
CS 5343.001: Homework #6

Due on Wednesday October 26, 2016 at 11:59pm

Professor Greg Ozbirn

Lizhong Zhang **(lxz160730)**
lxz160730@utdallas.edu

Contents

Problem 1 **2**

Problem 2 **2**

Problem 3 **3**

Problem 4 **4**

Problem 5 **6**

Problem 6 **8**

Problem 7 **10**

Problem 8 **12**

Problem 9 **14**

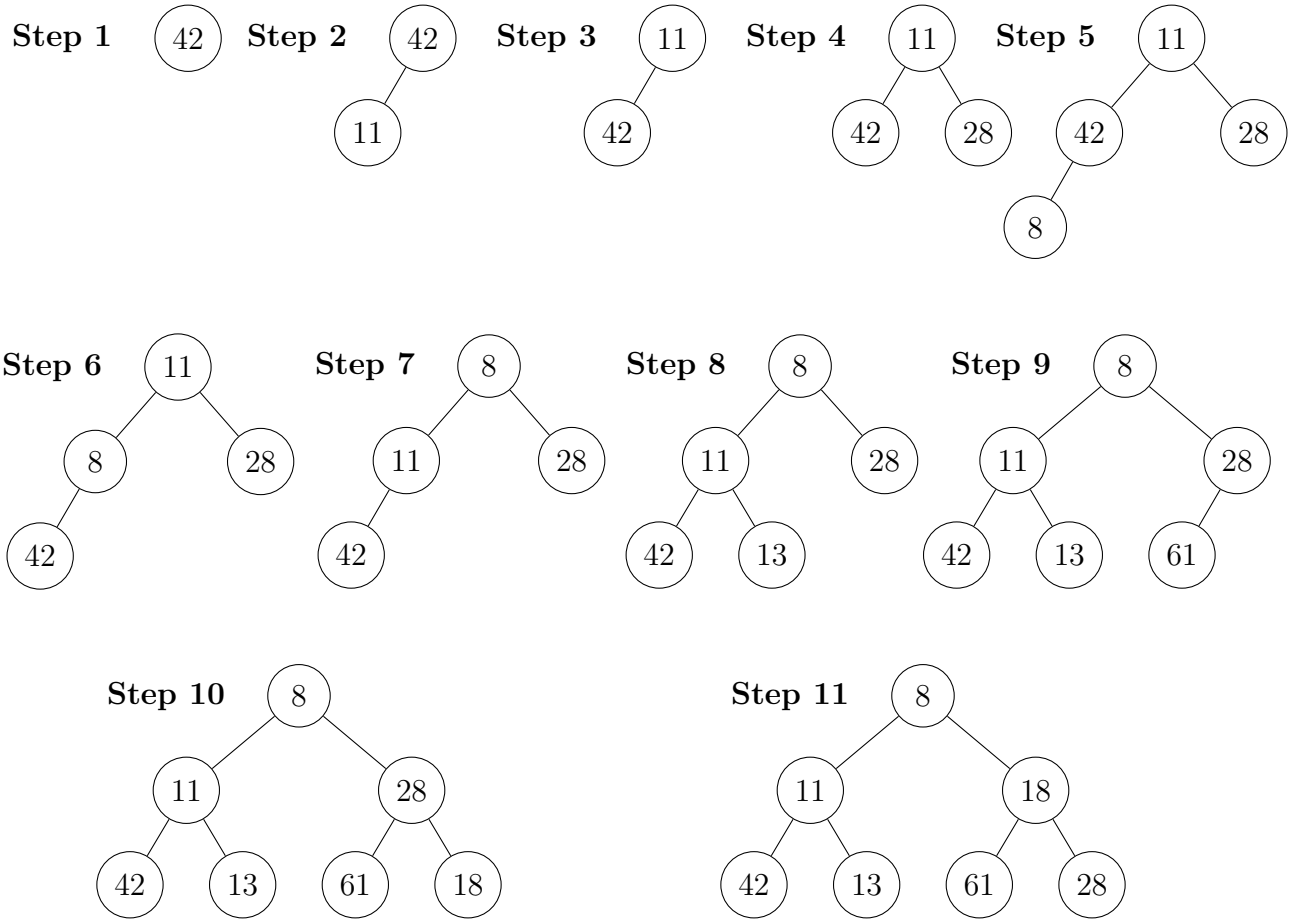
Problem 10 **16**

Part (a) 16

Part (b) 16

Part (c) 16

Problem 1

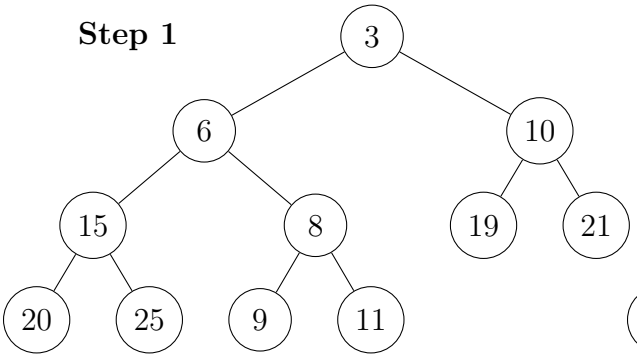


Problem 2

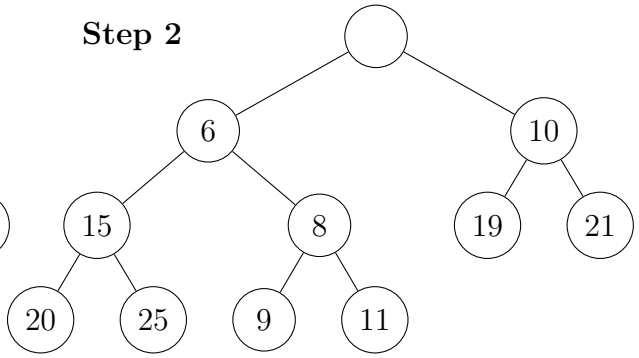
	8	11	18	42	13	61	28		
0	1	2	3	4	5	6	7	8	9

Problem 3

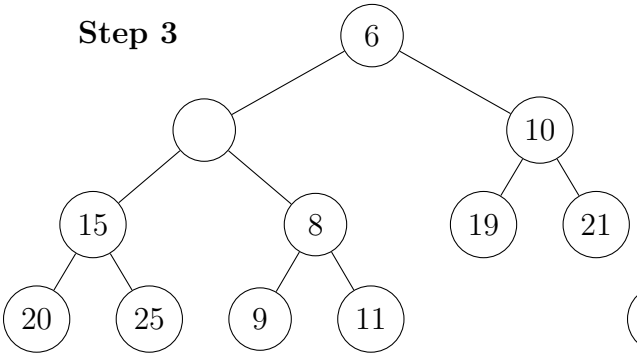
Step 1



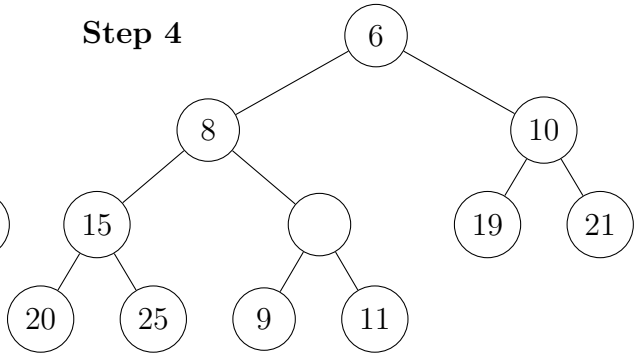
Step 2



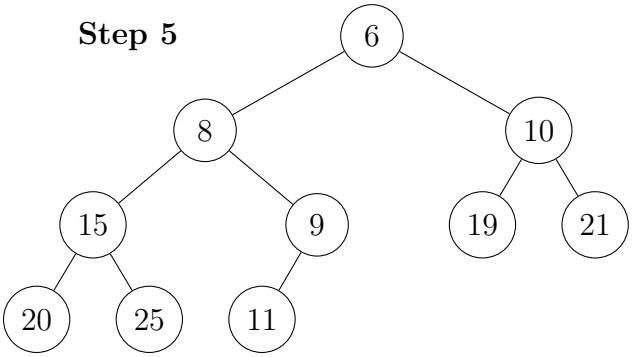
Step 3



Step 4

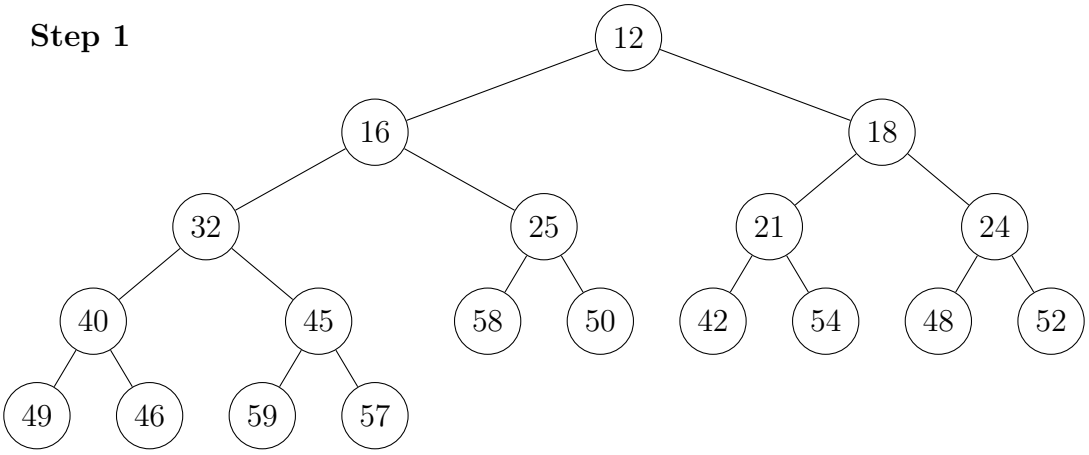


Step 5

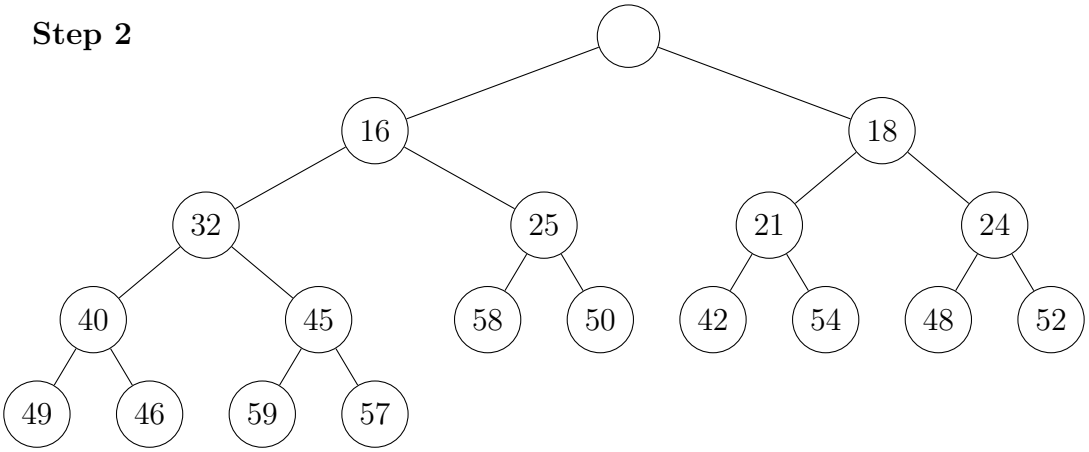


Problem 4

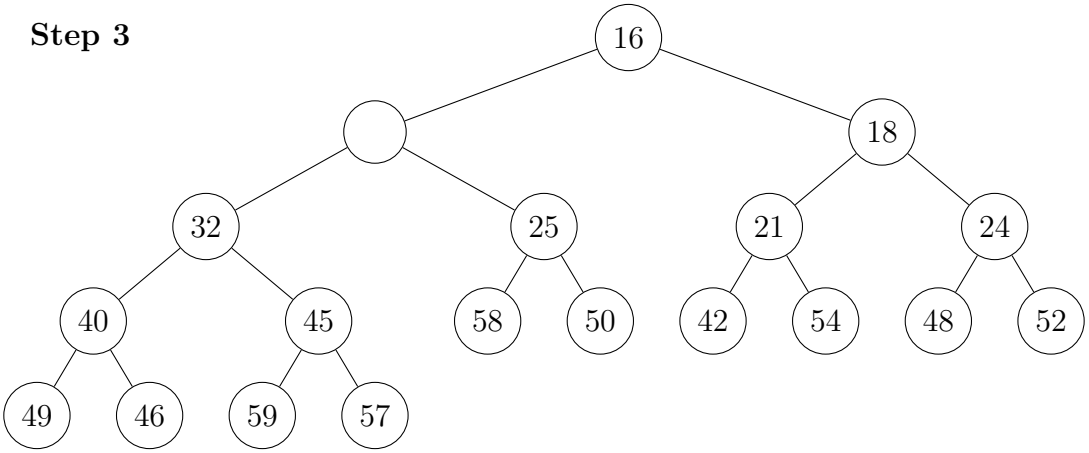
Step 1



Step 2

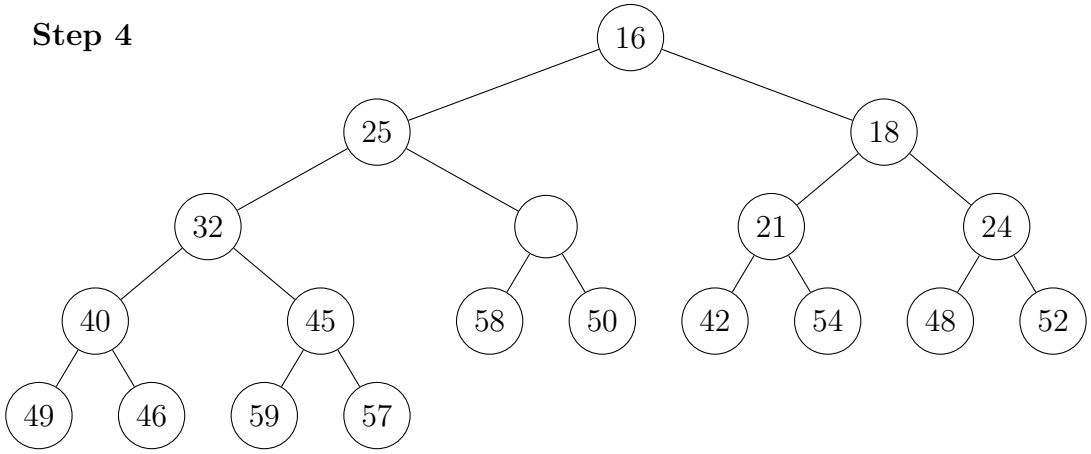


Step 3

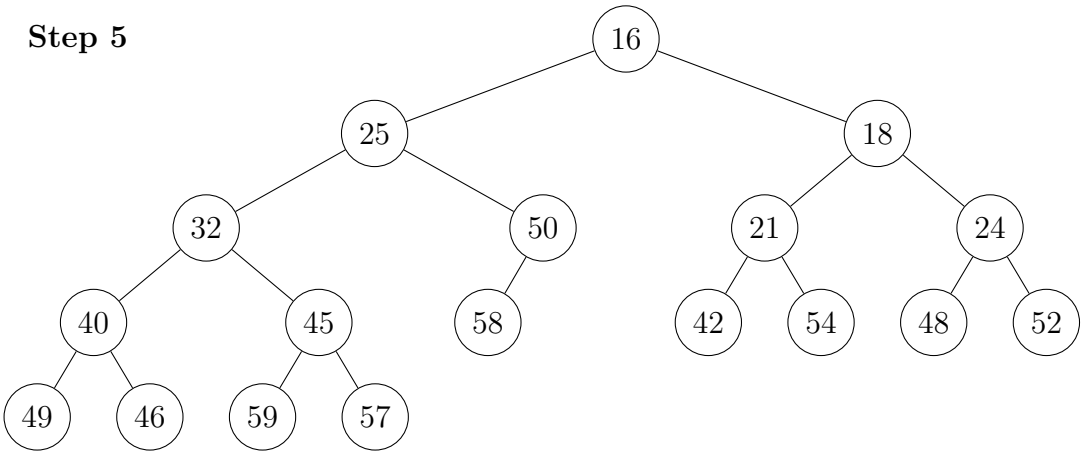


Problem 4 continued on next page...

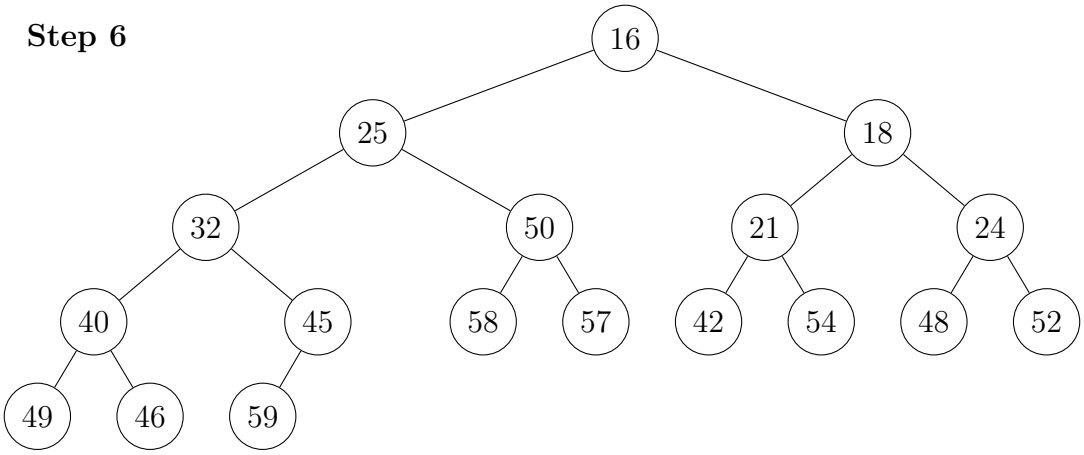
Step 4



Step 5

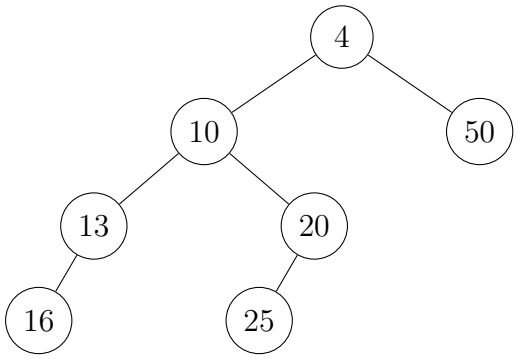


Step 6

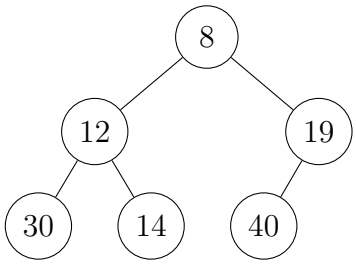


Problem 5

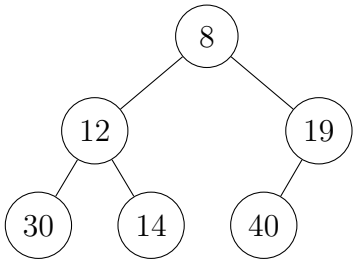
Start **h1**



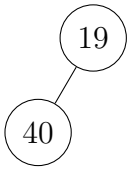
h2



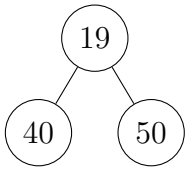
Step 1



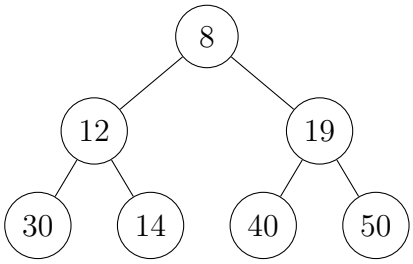
Step 2



Step 3

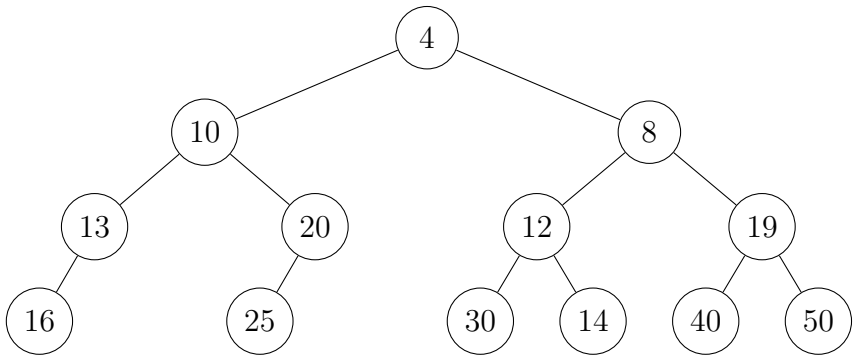


Step 4

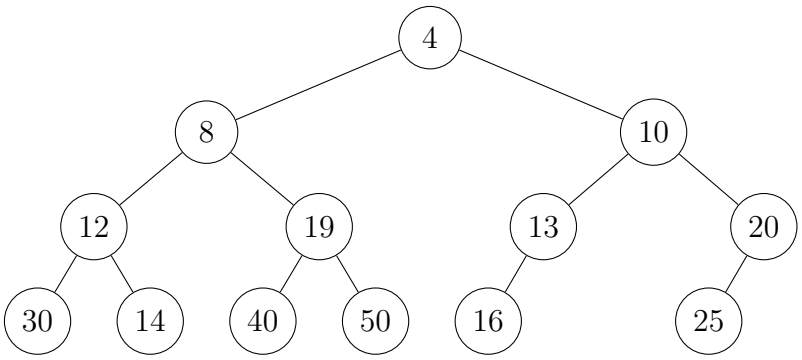


Problem 5 continued on next page...

Step 5



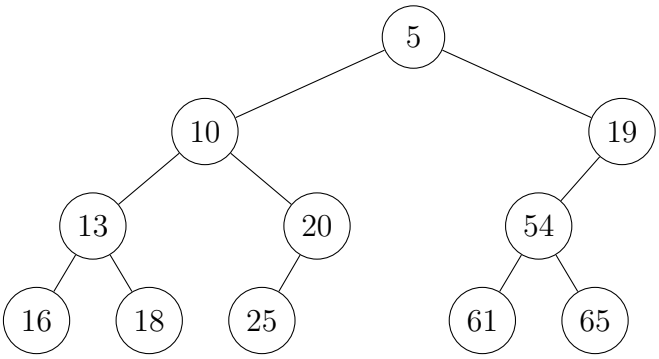
Step 6



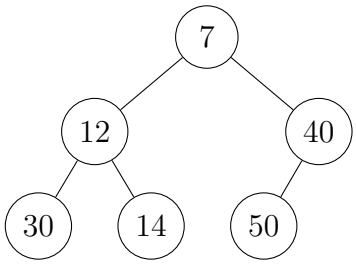
Problem 6

Start

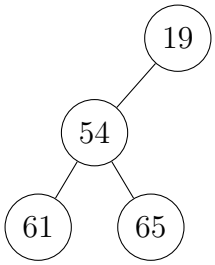
h1

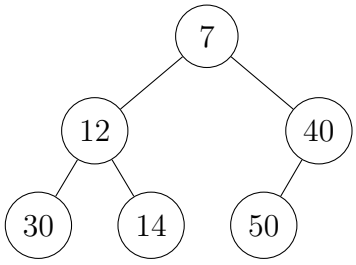


h2

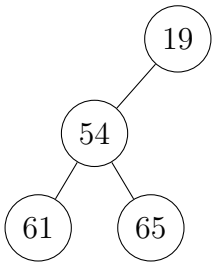


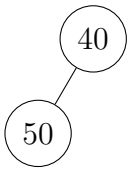
Step 1



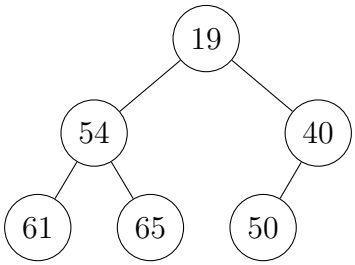


Step 2



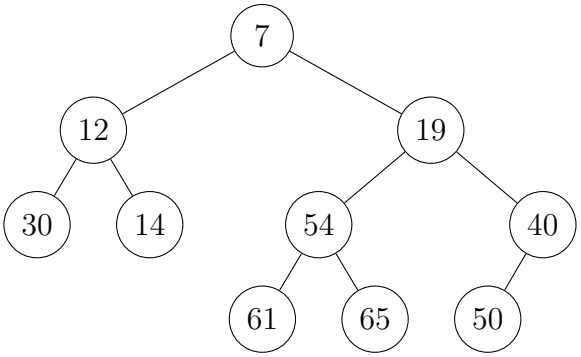


Step 3

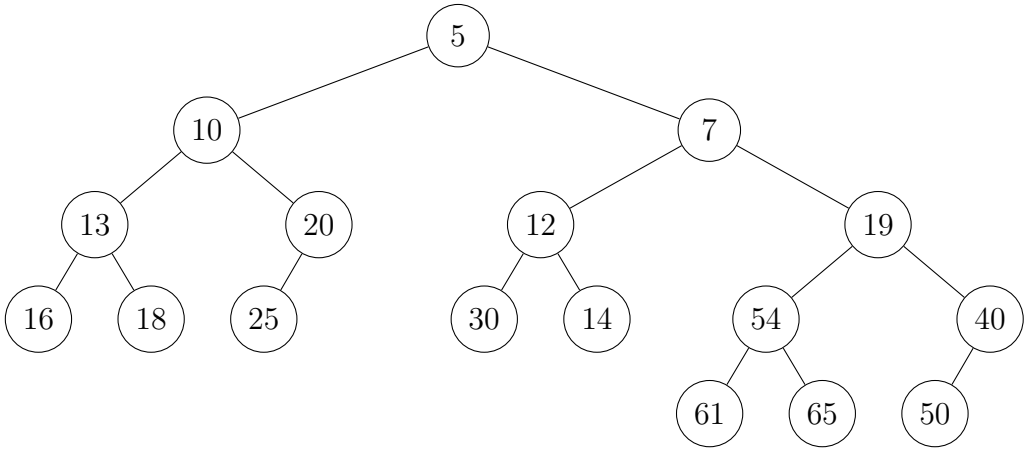


Problem 6 continued on next page...

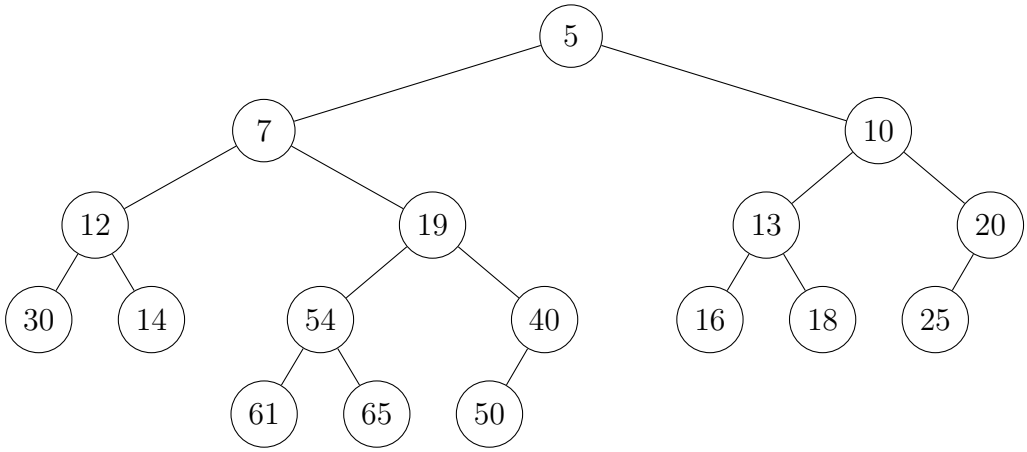
Step 4



Step 5



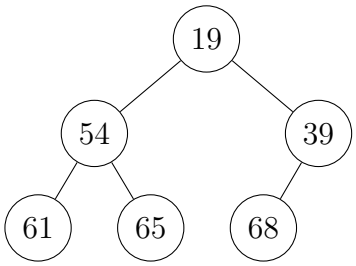
Step 6



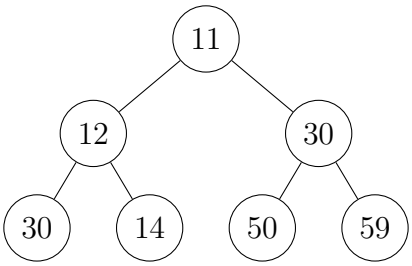
Problem 7

Start

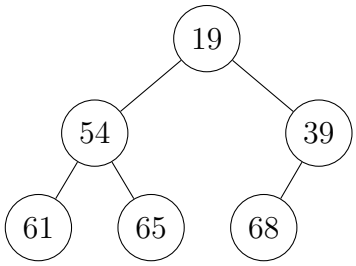
h1

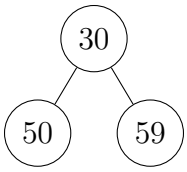


h2

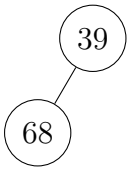


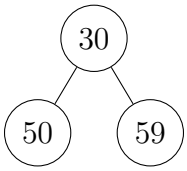
Step 1



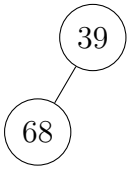


Step 2

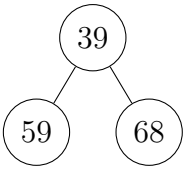




Step 3

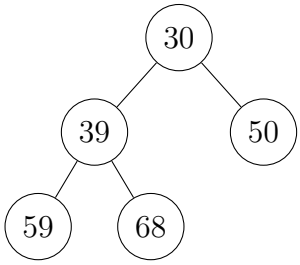


Step 4

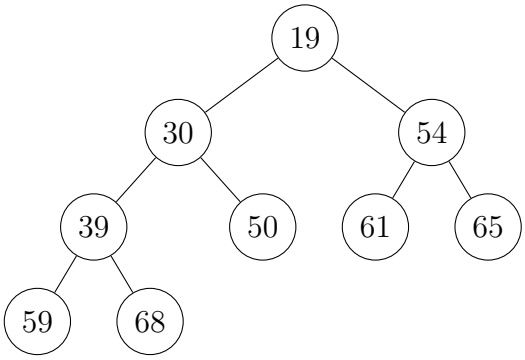


Problem 7 continued on next page...

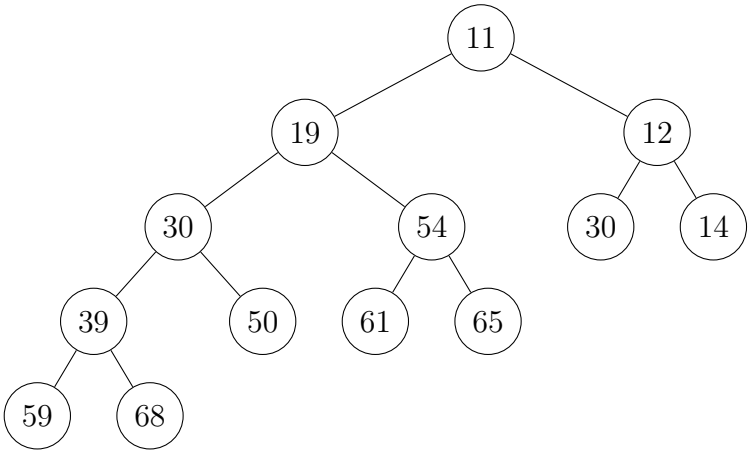
Step 5



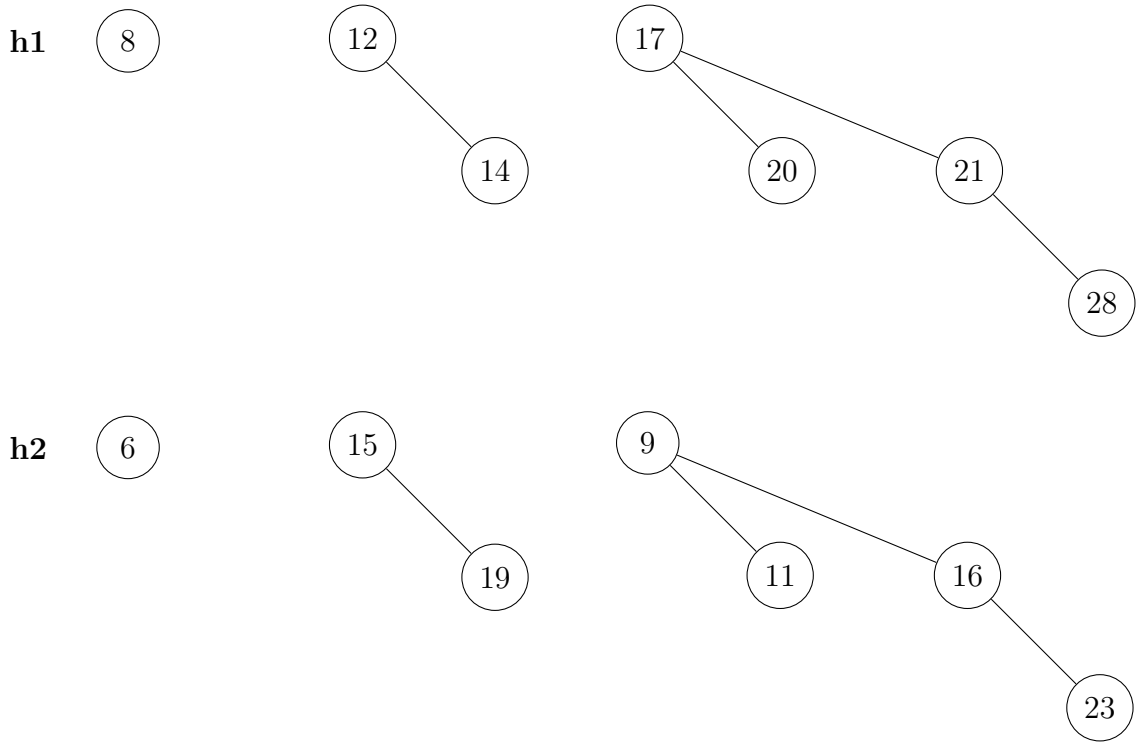
Step 6



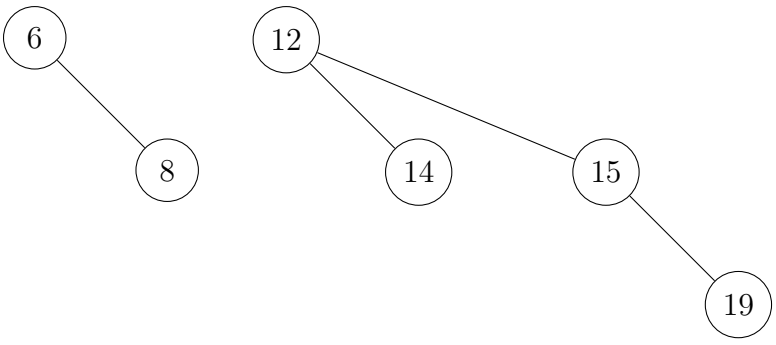
Step 7

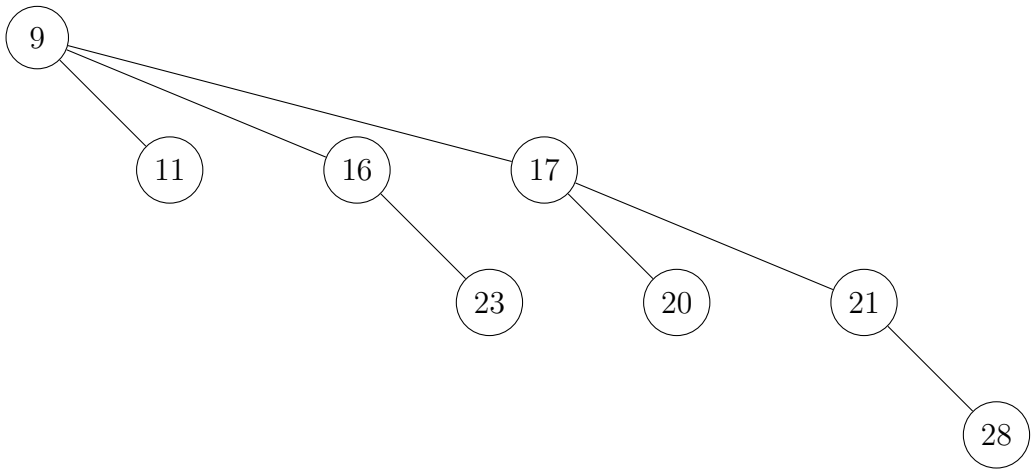


Problem 8

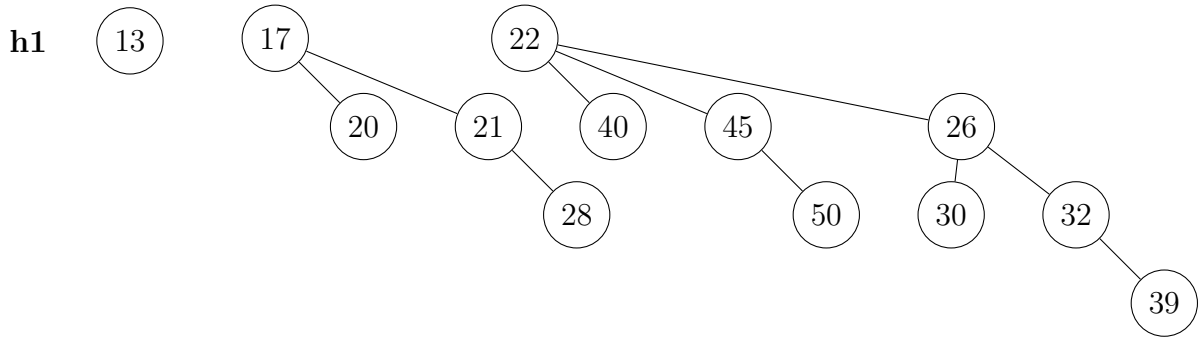


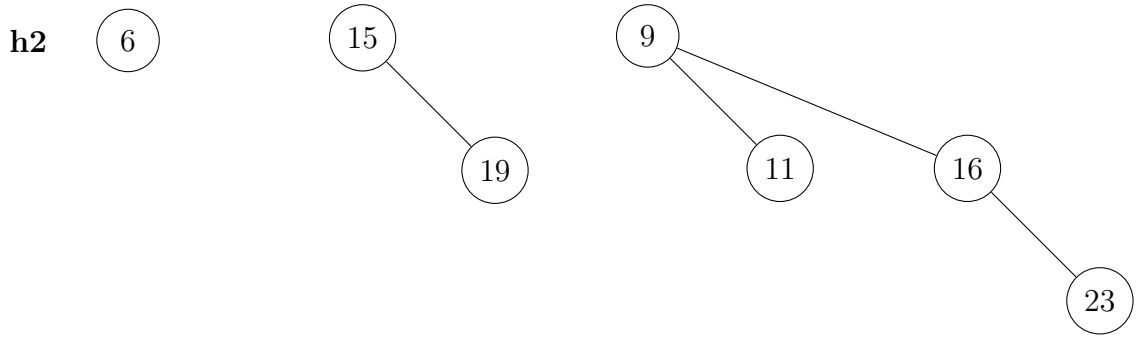
$h1 : 7$	111
$h2 : 7$	111
14	1110



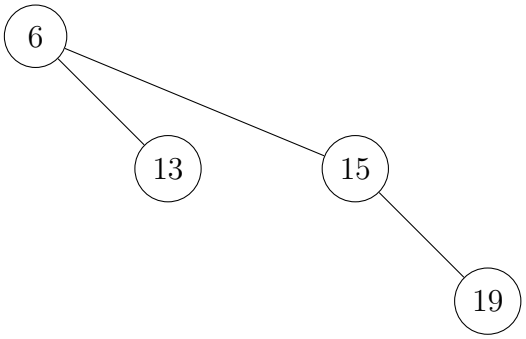

9
11
16
17
23
20
21
28

Problem 9

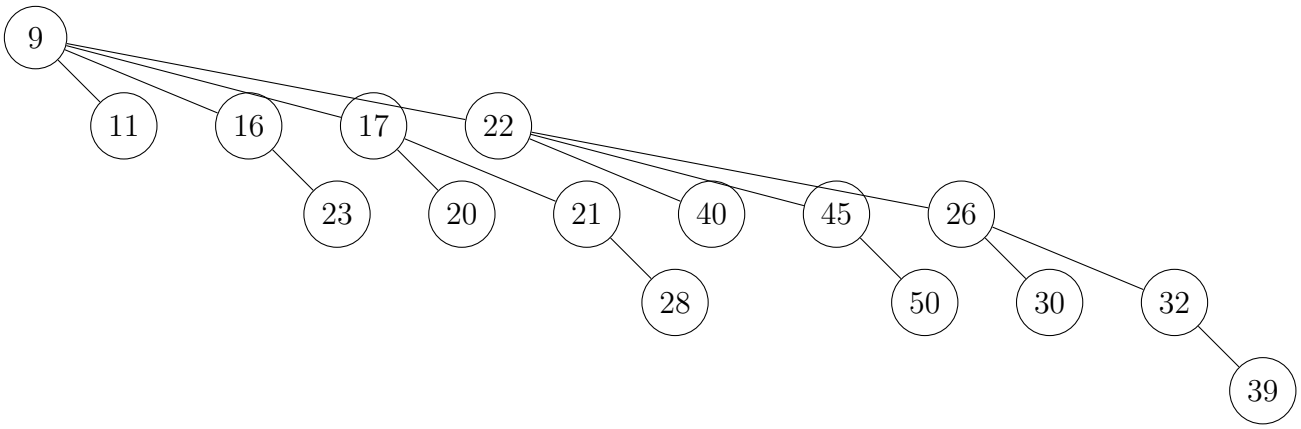




$h1 : 1 + 4 + 8 = 13$	1101
$h2 : 1 + 2 + 4 = 7$	111
20	10100



Problem 9 continued on next page...


9
11
16
17
22
23
20
21
40
45
26
28
50
30
32
39

Problem 10

Part (a)

	1	2	3	5	4	7	10	13	15	6	8	17	12	11	9	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Part (b)

If parent's index is i, then

- left child's index is $3i - 1$.
- middle child's index is $3i$.
- right child's index is $3i + 1$.

Part (c)

Let child's index be i.

$$parent's\ index = \begin{cases} \lceil \frac{i}{3} \rceil \text{ if } i \bmod 3 = 2 \\ \frac{i}{3} \text{ if } i \bmod 3 = 0 \\ \lfloor \frac{i}{3} \rfloor \text{ if } i \bmod 3 = 1 \end{cases}$$