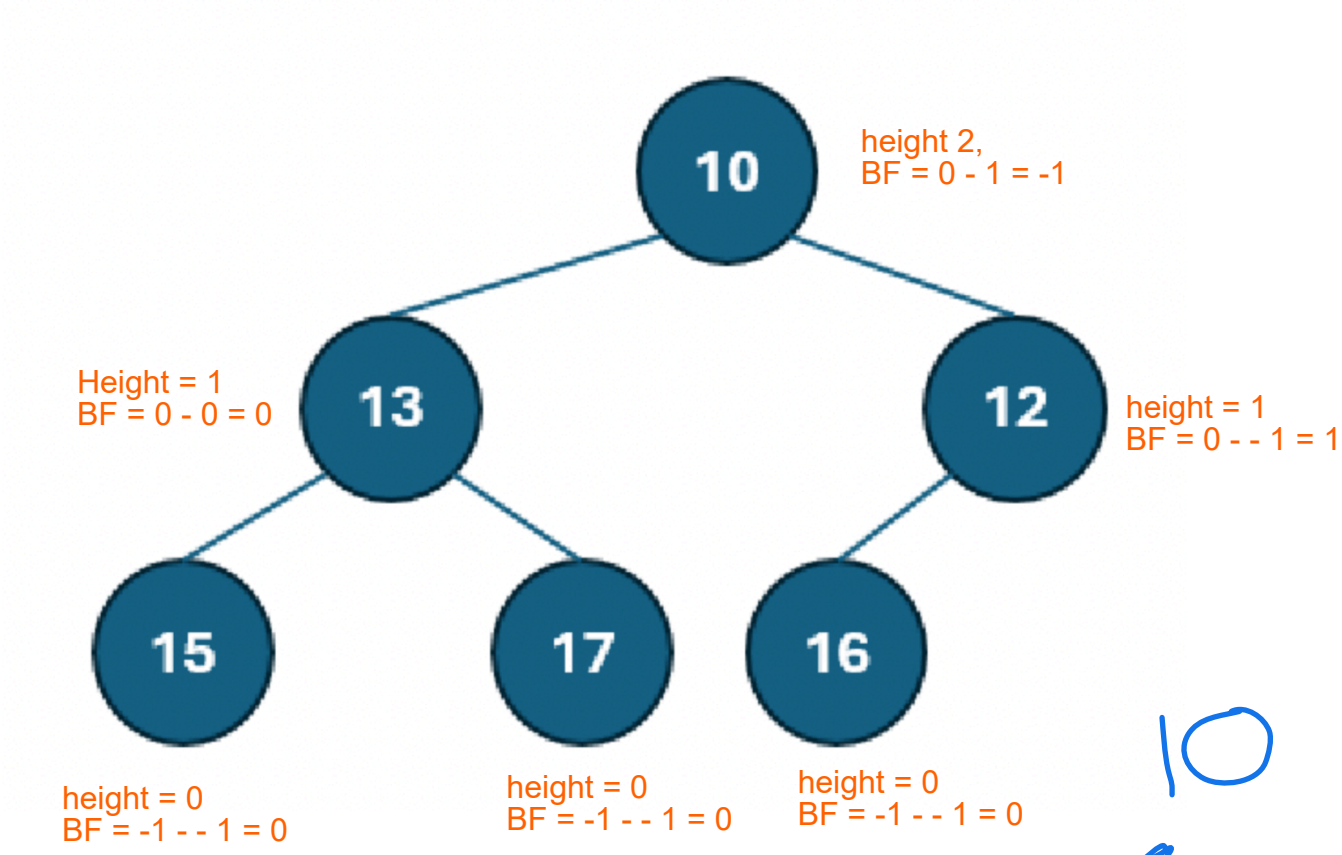
Courtney Hodge

Q1)Given the below Heap, perform the following operations: (25 pts)

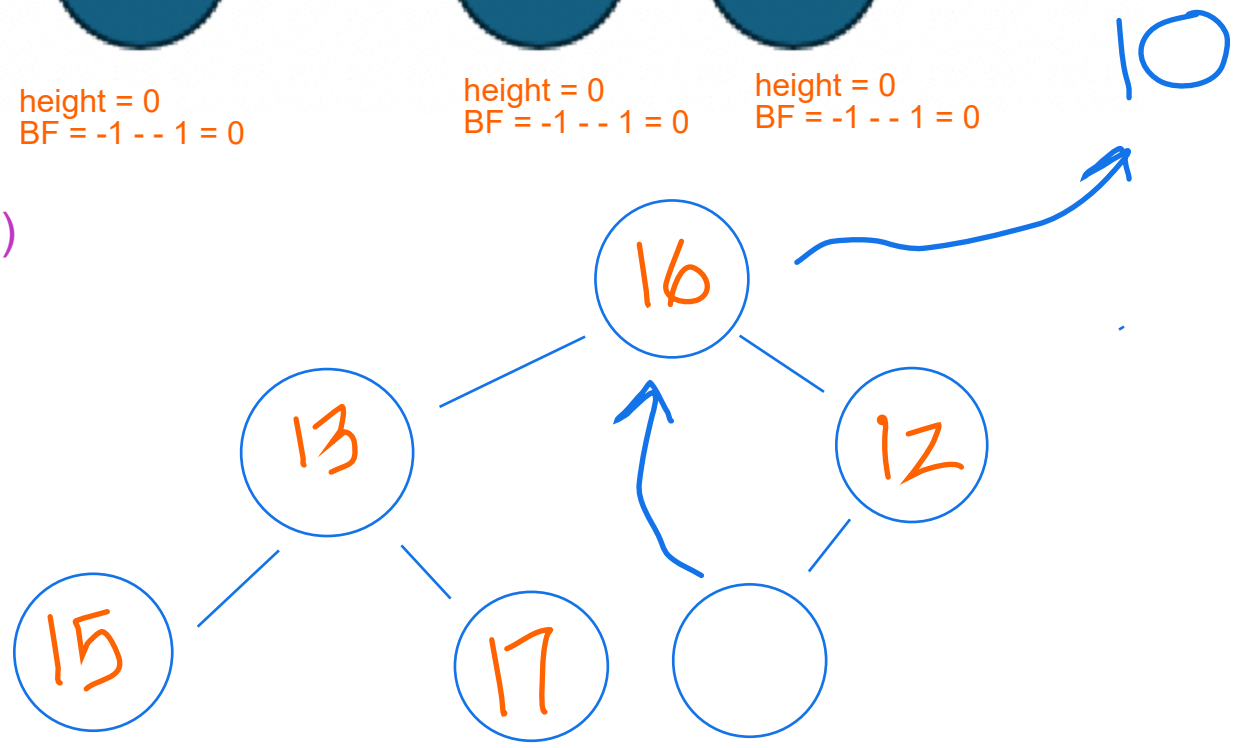
remove()

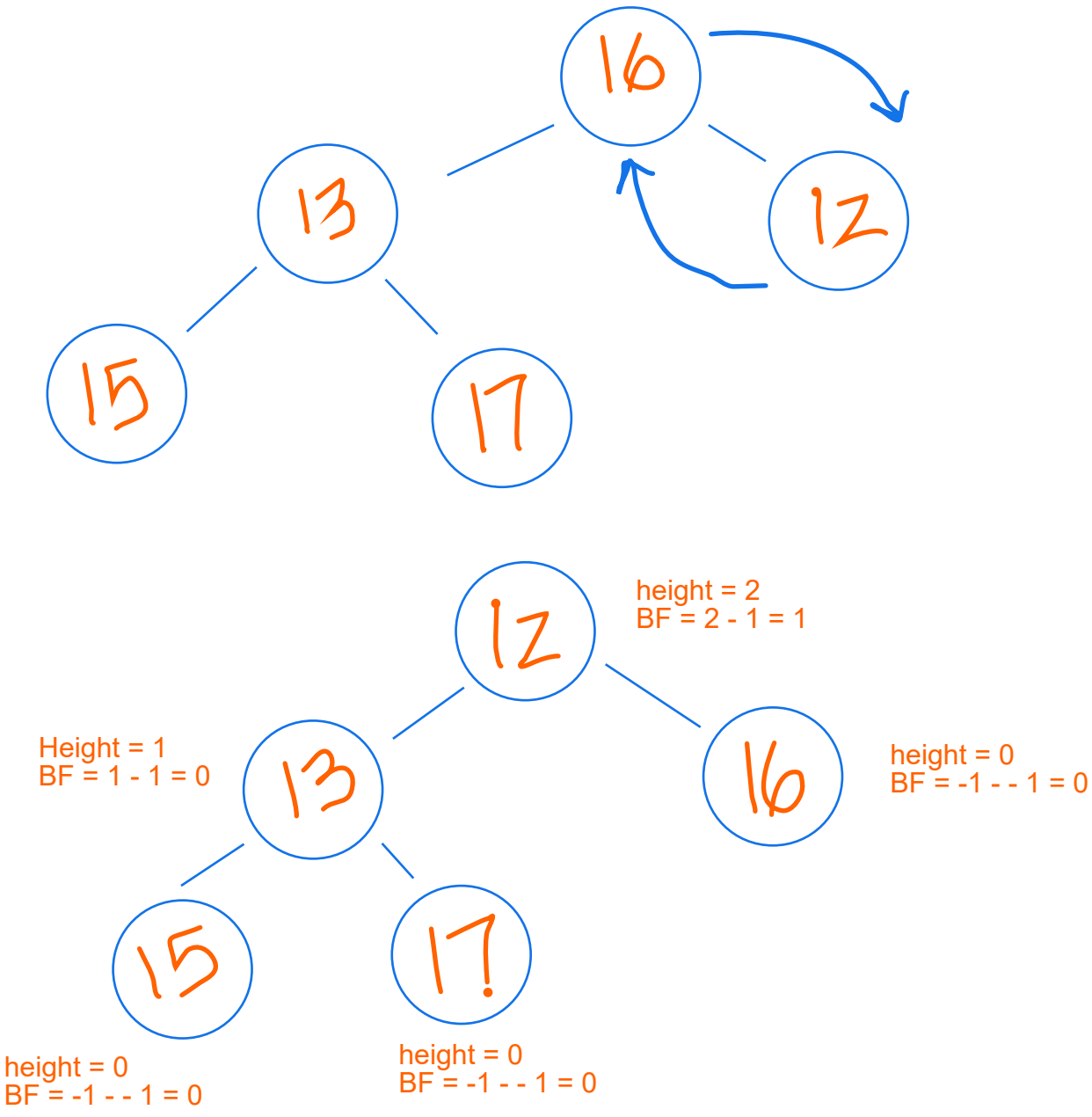
insert(5)

You need to show the balance factor of the heap both before and after each operation, and show any rotations required to rebalance the tree, if necessary



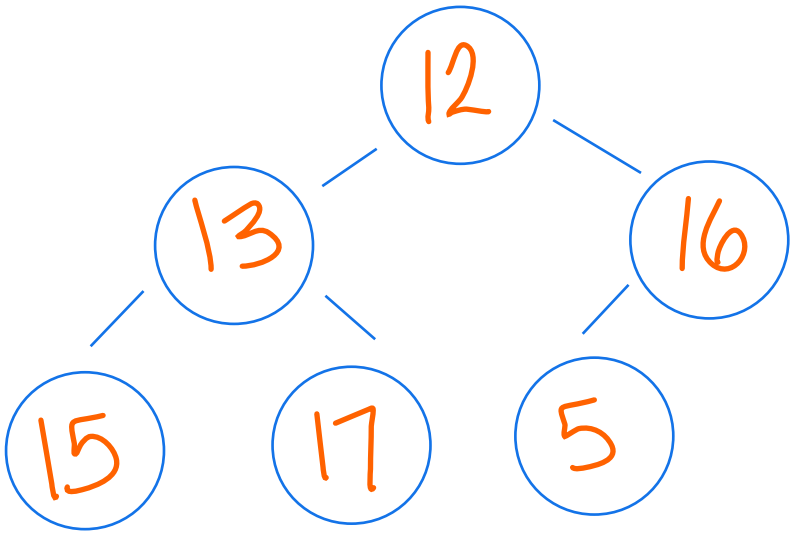
remove()

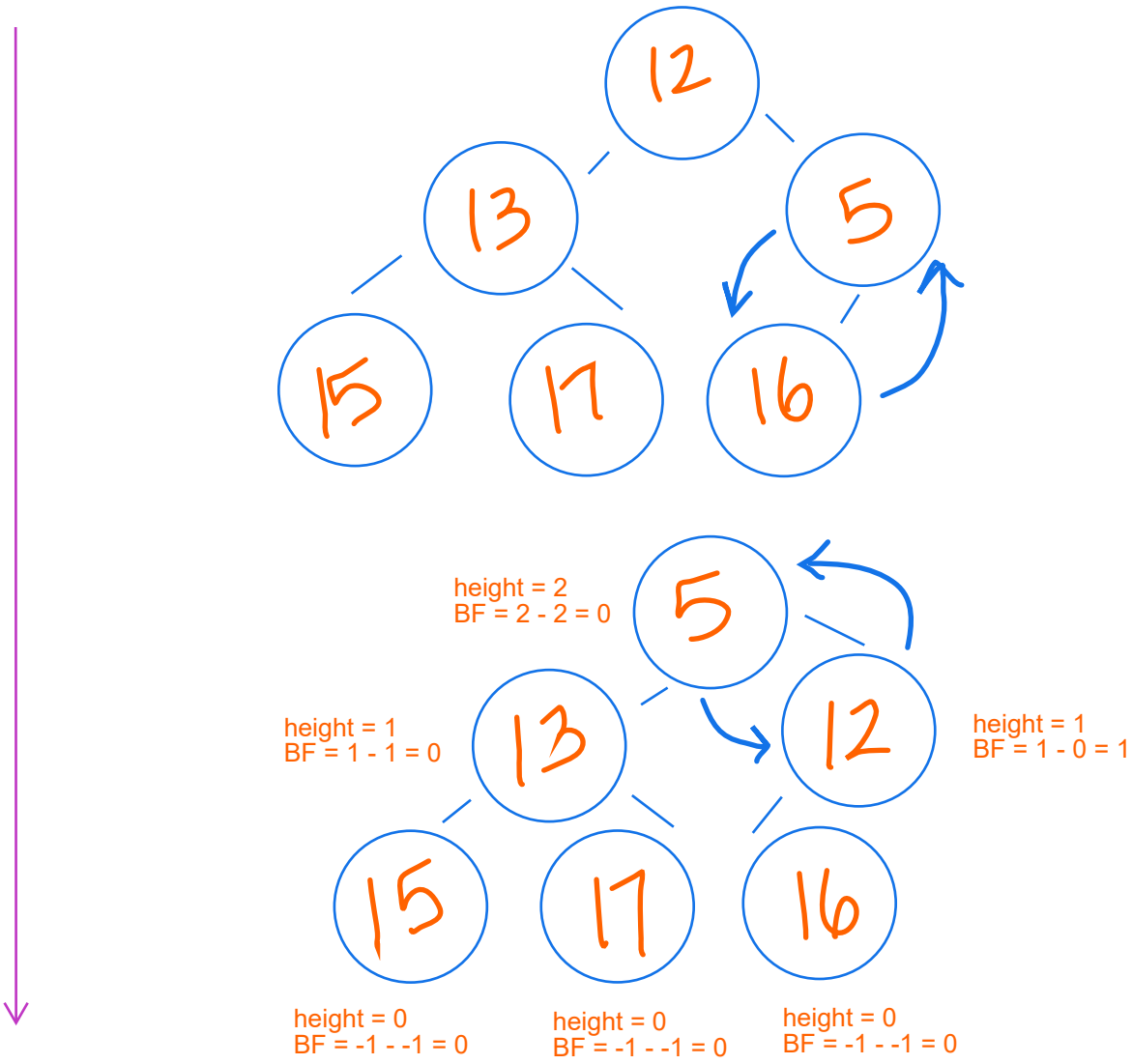



16
13
12
15
17

12
height = 2
BF = 2 - 1 = 1
Height = 1
BF = 1 - 1 = 0
13
16
height = 0
BF = -1 - - 1 = 0
15
17
height = 0
BF = -1 - - 1 = 0
height = 0
BF = -1 - - 1 = 0

insert(5)

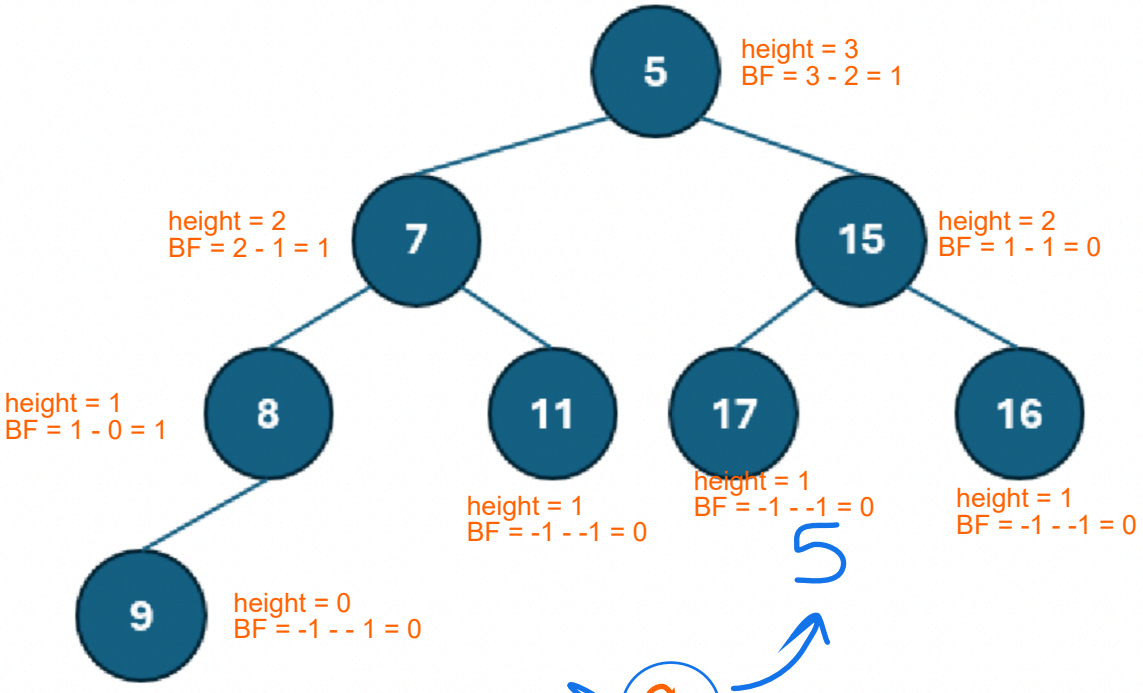

12
13
16
15
17
5

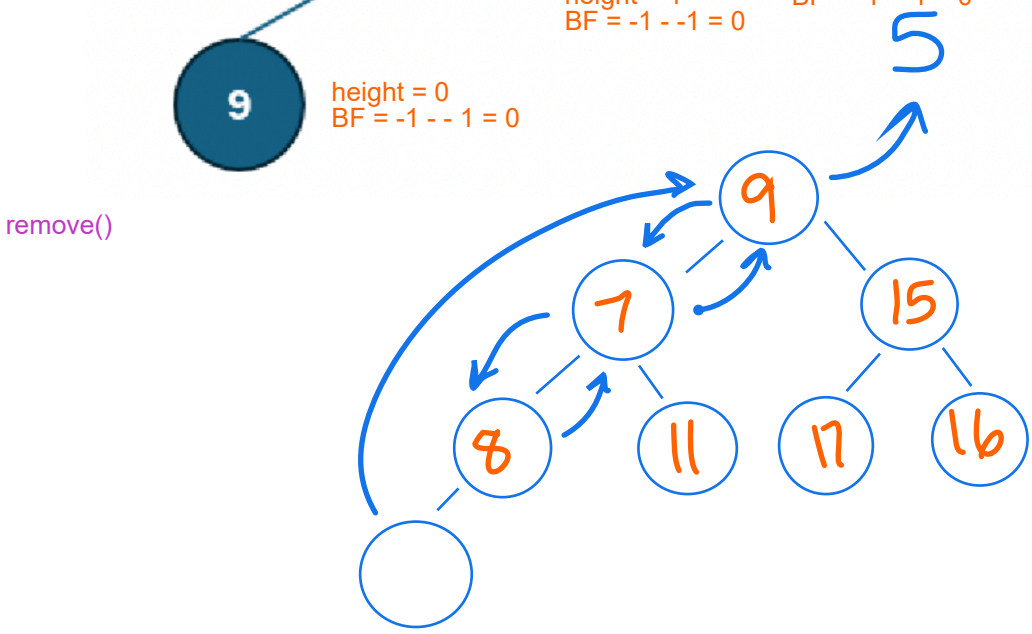

12
13
5
15
17
16
height = 2
BF = 2 - 2 = 0
5
height = 1
BF = 1 - 1 = 0
13
12
height = 1
BF = 1 - 0 = 1
15
17
16
height = 0
BF = -1 - -1 = 0
height = 0
BF = -1 - -1 = 0
height = 0
BF = -1 - -1 = 0

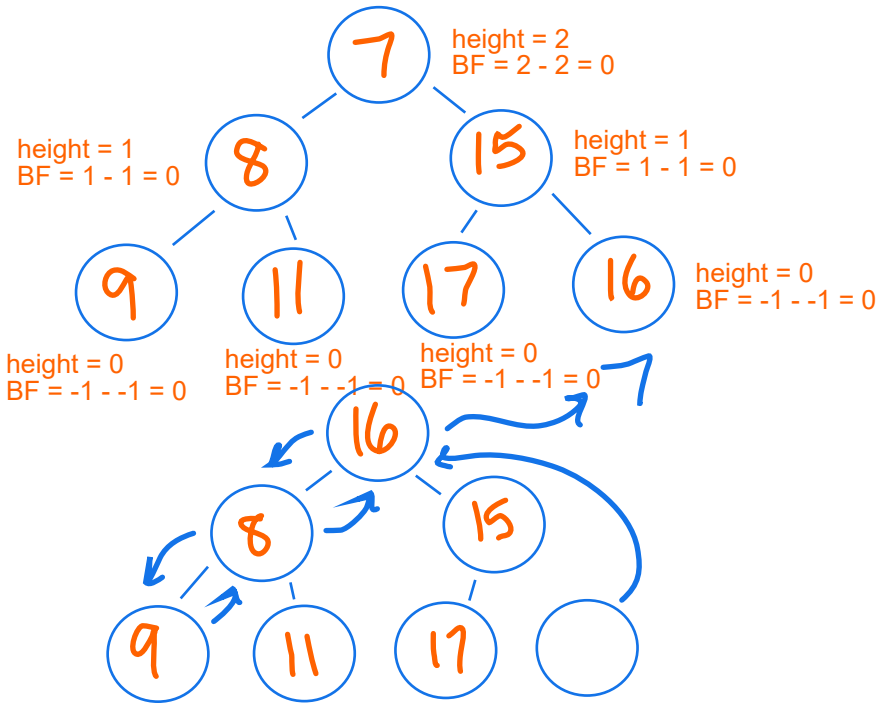
Q2)Given the below Heap, perform the following operations: (75 points)

remove()
remove()
List the **in-order traversal** of the tree at this point
insert(12)
insert(18)
insert(6)
List the **in-order traversal** of the tree at this point

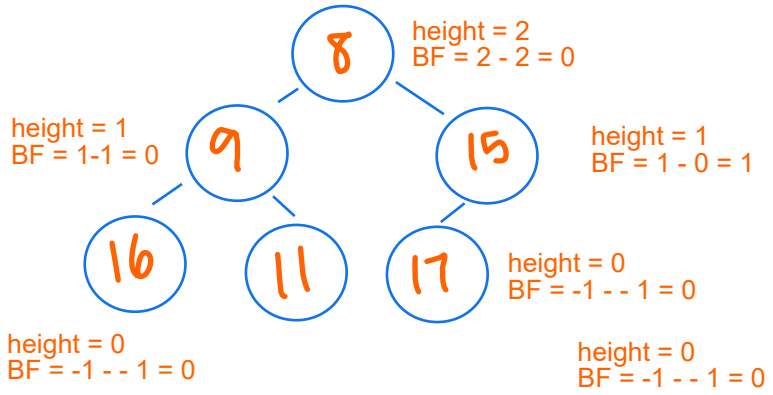
You need to show the balance factor of the heap both before and after each operation, and show any rotations required to rebalance the tree, if necessary.





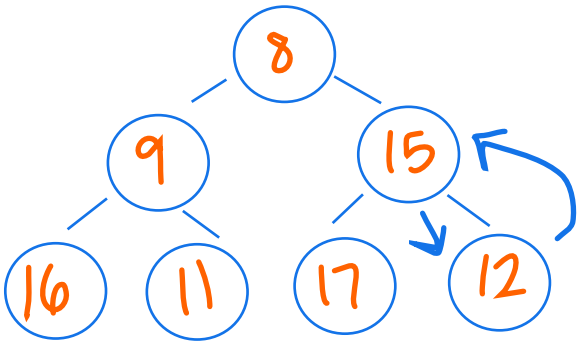


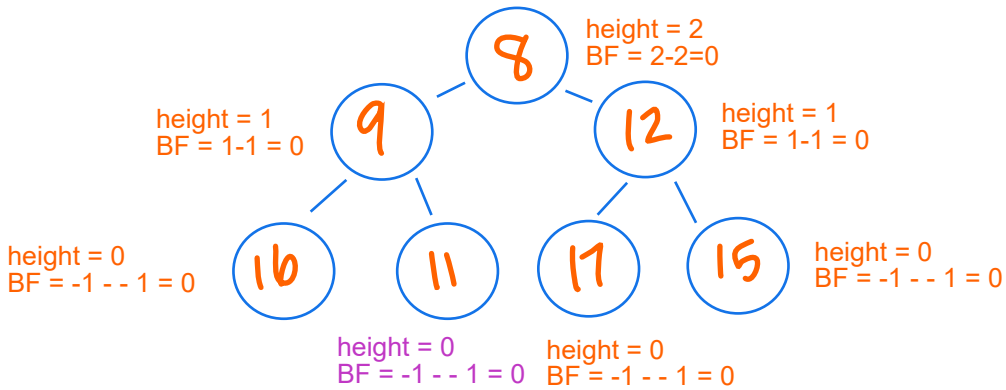
remove()



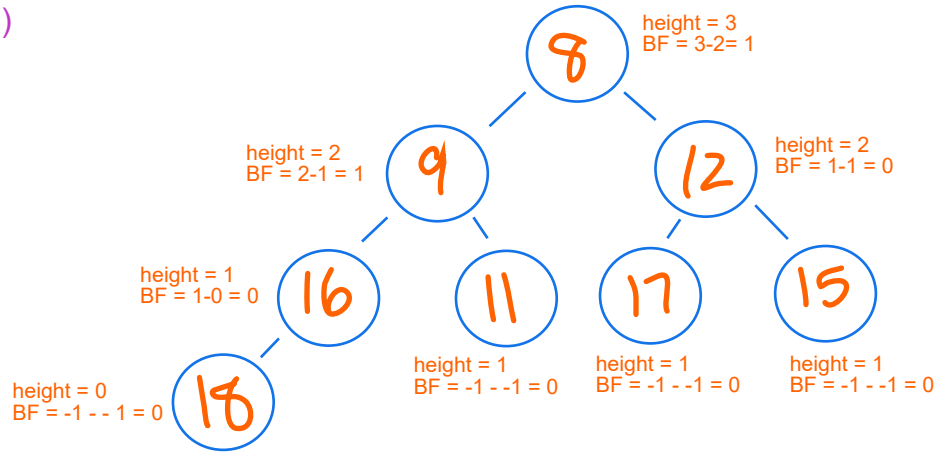
List the in-order traversal of the tree at this point: (16 9 11 8 17 15)

insert(12)

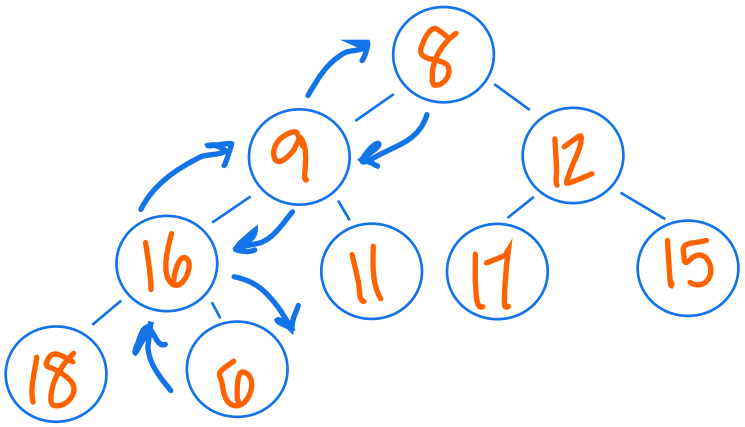


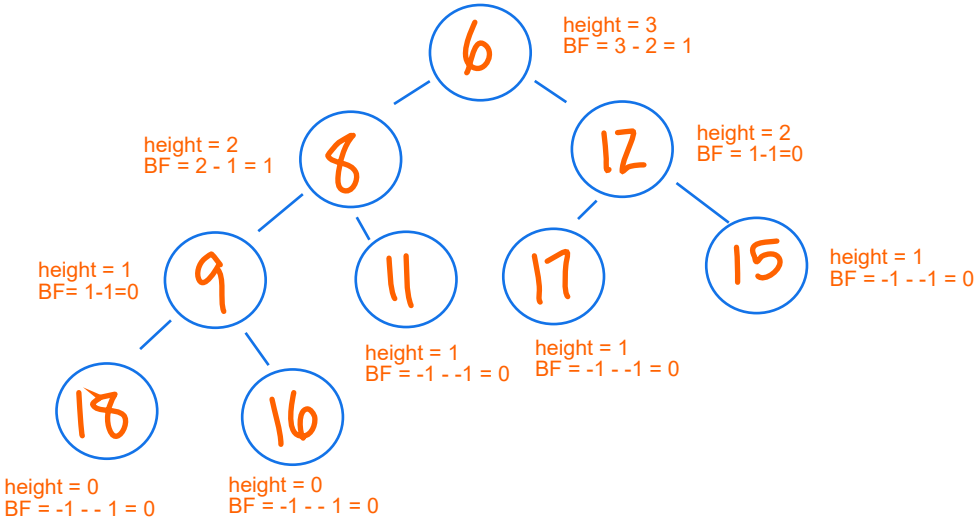


insert(18)



insert(6)





List the in-order traversal of the tree at this point: (18 9 16 8 11 6 17 12 15)