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Part 4(a)

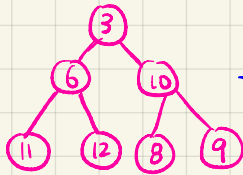
0	1	2	3	4	5	6
10	12	3	11	6	8	9

$(6/2)+1=4$, ignore last 4 nodes

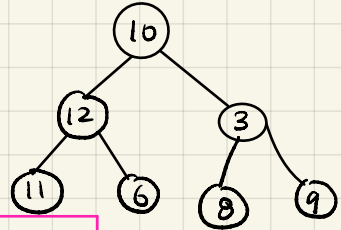
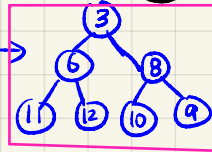
- heapify(2), 3 is the smallest

- heapify(1), swap(6, 12)

- heapify(0), swap(3, 10)



→ swap(10, 8) →

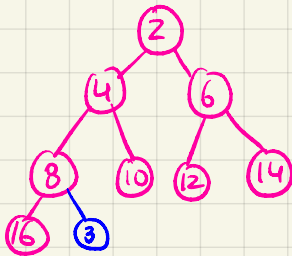


Part 4(b)

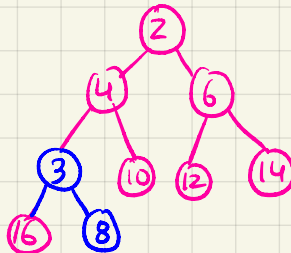
0	1	2	3	4	5	6	7
2	4	6	8	10	12	14	16

$(7/2)+1=4$ (leaf nodes)

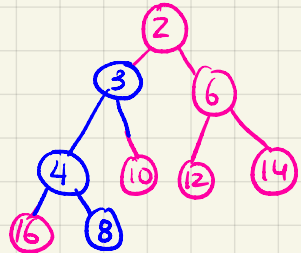
① insert 3



swap(8, 3)

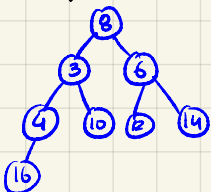


swap(3, 4)

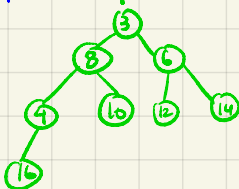


② pop(top element)

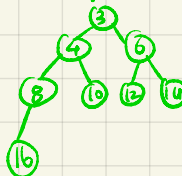
swap(2, 8), pop



swap(3, 8)

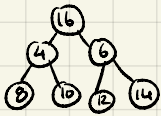


swap(4, 8)

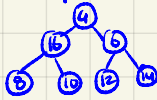


③ pop (top element)

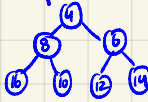
swap (3, 16), pop 3.



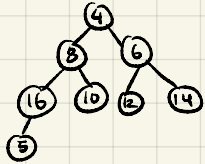
swap (4, 16)



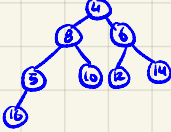
swap (8, 16)



④ insert 5



swap (5, 16)



swap (5, 8)

