

## HOMEWORK 4

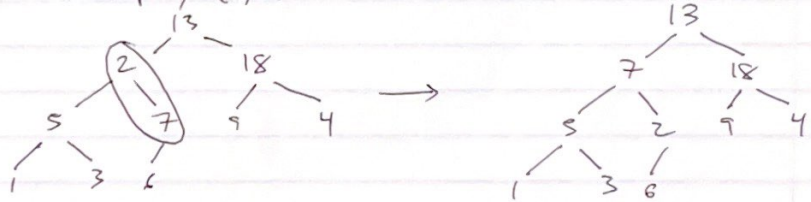
1) GIVEN  $a[0:5] = [13, 2, 18, 5, 6, 9]$ , SHOW THE PASSES OF INSERTION SORT.

PASS	13	2	18	5	6	9
1	13	2	18	5	6	9
2	2	13	18	5	6	9
3	2	13	18	5	6	9
4	2	5	13	18	6	9
5	2	5	6	13	18	9
6	2	5	6	9	13	18

b) BEST-CASE COMPLEXITY OF INSERTION SORT:  ~~$O(n^2)$~~   $O(n)$

c) WHAT IS THE COMPLEXITY OF INSERTION SORT IF ALL ELEMENTS ARE SORTED EXCEPT FOR ONE ELEMENT?  $O(n)$

2) GIVEN  $a[1:10] = [13, 2, 18, 5, 7, 9, 4, 1, 3, 6]$ , PLEASE WRITE THE RESULT OF  $\text{maxHeapify}(a, 2)$



RESULT:

$a[1:10] = [13, 7, 18, 5, 2, 9, 4, 1, 3, 6]$

3) APPLY MERGESORT TO  $a[1:8] = [3, 1, 4, 1, 5, 9, 2, 6]$

a) DETERMINE WORST-CASE TIME COMPLEXITY OF MERGESORT FOR REVERSE-ORDERED INPUT WITH SIZE  $n$ .

$O(n \log n)$

