2) (10 pts) ALG (Sorting)

(a) (5 pts) Show the state of the following array below after each iteration of an Insertion Sort. The results after the first iteration and last iteration are included for clarity.

Original	13	6	9	44	18	22	3	11
1st iteration	6	13	9	44	18	22	3	11
2nd iteration	6	9	13	44	18	22	3	11
3rd iteration	6	9	13	44	18	22	3	11
4th iteration	6	9	13	18	44	22	3	11
5th iteration	6	9	13	18	22	44	3	11
6th iteration	3	6	9	13	18	22	44	11
7th iteration	3	6	9	11	13	18	22	44

Grading: 1 pt per row, whole row has to be perfect to get the point

(b) (5 pts) List the **worst case** run time of each of the following sorting algorithms, in terms of n, the number of items being sorted.

(i) Insertion Sort $O(n^2)$

(ii) Selection Sort $O(n^2)$

(iii) Heap Sort O(nlgn) or O(nlog(n))

(iv) Merge Sort O(nlgn) or O(nlog(n))

(v) Quick Sort $O(n^2)$

Grading: 1 pt for each slot, all or nothing.