5) (10 pts) ALG (Sorting)

(a) (4 pts) Consider sorting the array below in ascending order using Bubble Sort. Show the contents of the array after each iteration of the outer loop.

Original	6	12	1	9	4	2
1st iteration	**6**	**1**	**9**	**4**	**2**	**12**
2nd iteration	**1**	**6**	**4**	**2**	**9**	**12**
3rd iteration	**1**	**4**	**2**	**6**	**9**	**12**
4th iteration	**1**	**2**	**4**	**6**	**9**	**12**
5th iteration	**1**	**2**	**4**	**6**	**9**	**12**

Grading: 1 pt for each of the first four lines, only award the point if the whole line is correct.

(b) (6 pts) Please provide the best case and worst case run times (Big-O) for each of the following three sorting algorithms, in terms of n, the number of elements being sorted.

Sort	**Best Case**	**Worst Case**
Merge Sort	O(nlgn)	O(nlgn)
Quick Sort	O(nlgn)	$O(n^2)$
Insertion Sort	O(n)	$O(n^2)$

Grading: 1 pt for each. Each is either correct or not correct. Accept if O() is left out.