COP 3502 Recitation Sheet: Sorting Solutions

1) Show the result of sorting the following array via **Bubble Sort**, showing the contents after each iteration of the algorithm:

Initial	3	2	16	8	12	9	19	1
1st iter	2	3	8	12	9	16	1	19
2nd iter	2	3	8	9	12	1	16	19
3rd iter	2	3	8	9	1	12	16	19
4th iter	2	3	8	1	9	12	16	19
5th iter	2	3	1	8	9	12	16	19
6th iter	2	1	3	8	9	12	16	19
7th iter	1	2	3	8	9	12	16	19

2) Show the result of sorting the following array via **Insertion Sort**, showing the contents after each iteration of the algorithm:

Initial	3	2	16	8	12	9	19	1
1st iter	2	3	16	8	12	9	19	1
2nd iter	2	3	16	8	12	9	19	1
3rd iter	2	3	8	16	12	9	19	1
4th iter	2	3	8	12	16	9	19	1
5th iter	2	3	8	9	12	16	19	1
6th iter	2	3	8	9	12	16	19	1
7th iter	1	2	3	8	9	12	16	19

3) Show the result of sorting the following array via **Selection Sort** (where we select for the maximum value on the first iteration), showing the contents after each iteration of the algorithm:

Initial	3	2	16	8	12	9	19	1
1st iter	3	2	16	8	12	9	1	19
2nd iter	3	2	1	8	12	9	16	19
3rd iter	3	2	1	8	9	12	16	19
4th iter	3	2	1	8	9	12	16	19
5th iter	3	2	1	8	9	12	16	19
6th iter	1	2	3	8	9	12	16	19
7th iter	1	2	3	8	9	12	16	19

4) In the process of Merge Sorting the array below, there are a total of 7 calls to the Merge function. Show the contents of the array after each one of those calls, in the sequence in which the calls complete.

Initial	3	2	16	8	12	9	19	1
1st merge	2	3	16	8	12	9	19	1
2nd merge	2	3	8	16	12	9	19	1
3rd merge	2	3	8	16	12	9	19	1
4th merge	2	3	8	16	9	12	19	1
5th merge	2	3	8	16	9	12	1	19
6th merge	2	3	8	16	1	9	12	19
7th merge	1	2	3	8	9	12	16	19

5) Show the result of running the Partition algorithm shown in class on the following array, using the item currently in index 0 as the partition element:

Index	0	1	2	3	4	5	6	7	8
Value	13	6	22	27	10	19	5	4	11
After Partition	5	6	11	4	10	13	19	27	22

6) For fun, here's a link to a Kattis problem that requires sorting:

https://open.kattis.com/problems/aprizenoonecanwin

(This is just in case anyone finishes the given exercises early!)