Activity Sheet 1

Manager name:

Recorder name:

Speaker name:

Questions

Section 1.1

1. For two positive numbers m, n, assuming $m > n$, the greatest common divisor of m and n is the same as the greatest common divisor of n and $m - n$. Use this idea to devise an algorithm for computing the greatest common divisor of two numbers.
2. Write an algorithm that takes as input a shorted array of integers, and another integer. It has to place the new integer in the appropriate place in the array, to maintain the sorted property. You must create and return a new array rather than change the given array.
3. (Book problem 1.1.5) Design an algorithm that given two lists each with numbers sorted from smallest to largest, possibly with repetitions, returns a list of the common numbers (possibly repeated if the lists had some number multiple times). Imagine that you can write your results in a variable length array. You can only access the lists

Section 1.2

4. Look at exercise 1.2.9, which describes an algorithm for finding the smallest distance between any two elements in an array.
    a. Describe in plain English why the algorithm is correct.
    b. There are at least two improvements we can make to improve this algorithm. What are they? Can you think of more improvements?
    c. Can you think of possibly a different approach to this problem?

Section 1.3

5. Look at exercise 1.3.1, which describes a sorting algorithm by performing "comparison counting", i.e. for each element counting the number of elements that are less than it, and using this information to sort the elements.
    a. Apply the algorithm to sort the list 60, 35, 81, 98, 14, 47
    b. Is this a stable sorting algorithm? Is it an in-place sorting algorithm?