Submissions: This assignment is due in class on T Feb 4th 2020. Each student must submit his or her own assignment. Solutions can either be typed in Latex, MSWord or other such word processing software, or printed clearly. You must write your name and UUID clearly on your submitted assignment.

Academic Integrity: You are encouraged to work in groups, but everyone must write out their own solutions. Absolutely no word to word copying is allowed. Please refer to the course policies and schedules about this. If you have worked with other students on the assignment or referred to external sources, please mention all names and sources on your assignment.

Partial solutions: If you are sure that you know how to arrive at a solution, but you get stuck in some place, it is better to write the partial solution. Honest attempts at partial solutions will be awarded.

4030/6030 points: Students enrolled in 4030 can solve only the first two problems correctly for full points. The corresponding points for 6030 students are also mentioned. They need to solve another one for full points.

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**Problem 1 [50/40 pts]** Solve problem 0.2 of the textbook.

**Problem 2 [50/30 pts]** Write pseudocode to solve the following problem: You are given an array $A[1 \ldots n]$ whose each element is a point of the plane $(x, y)$. You need to sort the array so that points with lower $x$-coordinate come earlier, but among points with the same $x$-coordinate, the ones with larger $y$-coordinate come earlier. So, for example if the array contains,

$$(1, 2), (1, 4), (7, 10), (11, 3), (14, 1), (7, 2)$$

The output in this case should be:

$$(1, 4), (1, 2), (7, 10), (7, 2), (11, 3), (14, 1).$$

Analyze the running time of your algorithm as a function of $n$.

**Problem 3 [0/30 pts]** Consider the Fibonacci sequence defined as $F_0 = 1, F_1 = 1, F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$. Show, using induction, that there exists some constant $A$ such that $F_n \geq A(1.5)^n$. 
