Homework 4

Handed out Tuesday, August 3. Due at the start of class Monday, August 9. Late homeworks will not be accepted.

**Problem 1.** Let $(E, L)$ be a subset system ($A \in L$ and $A' \subseteq A$ then $A' \in L$). A matroid is a subset system $(E, L)$ with the following property:

If $A, B \in L$ and $|A| < |B|$ then $\exists x \in B \setminus A$ such that $A \cup \{x\} \in L$

Prove that the following alternative definition is equivalent. A matroid is a subset system $(E, L)$ with the following property:

$\forall A \subseteq E$ let $B, C \in L$ be maximal subsets of $A$ then $|B| = |C|$

**Problem 2.** From the book: Exercise 16.1-3 (interval-graph coloring)

**Problem 3.** From the book: Problem 16-1 (coin changing)

**Problem 4.** From the book: Problem 16-4 (scheduling variations) You only need to do part a. You may do part b for extra credit.