CS 271 (Spring 2013) — Assignment 8
Due: 04/16/2013

(1) Read Sections 6.4, 7.1, 7.2.

(2) Solve the following problems from earlier chapters. These are quite easy problems in principle. The point of doing them is to carefully review the definitions, and how to prove subset inclusion or set equalities, since so many people didn't get it right on the third quiz. This type of proof should be second nature to you.

- Section 2.2, Exercises 24, 40.
- Section 3.2, Exercises 40, 46.
- Section 5.1, Exercise 38.

(3) Solve the following exercises from the textbook

(a) Section 6.3, Exercises 18, 22, 30, 32, 46

(b) Section 6.4, Exercises 14, 20, 28, 32

(4) In class, we talked about Ramsey Numbers $R(n, m)$. If you don't remember the definition, look it up in the textbook. Prove by induction on $n + m$ that $R(n, m) \leq 2^{n+m-2}$ for all $n, m \geq 2$. (Hint: the textbook contains some useful identities, including some that might help with your base case; you can use Exercises 29 and 30 from Section 6.2 without proof.)

(5) [0 points]
Chocolate Problem (1 chocolate bar): Let $S \subseteq \{1, 2, 3, \ldots, 100\}$ be a set with $|S| = 10$, i.e., containing exactly 10 integers between 1 and 100. Prove that there must be non-empty sets $A, B \subseteq S$ with $A \cap B = \emptyset$ such that $\sum_{a \in A} a = \sum_{b \in B} b$. (Hint: This problem is almost too easy to be worth a chocolate bar.)