Homework #2, CS 336

This homework is due September 17 at 2:15, in class (or emailed in pdf form, in advance).

1. Do all the problems on page 11 of the lecture for September 8 (see the course webpage). Here, the size of a clique is the number of vertices in the clique, the size of an independent set is the number of vertices in the independent set, etc. Please read the document at www.cs.utexas.edu/users/tandy/class1.pdf for definitions of graph-theoretic terms.

2. Consider the sequence of sets A_n defined recursively by $A_1 = \emptyset$, and $A_n = A_{n-1} \cup (n-1, n)$.

   (a) What is A_2?

   (b) What is A_5?

   (c) What is the closed form for A_n? (Prove your assertion by induction on n.)

   (d) What is $\cup_n A_n$?

3. Consider the sequence of sets B_n defined recursively by $B_1 = \emptyset$ and $B_n = B_{n-1} \cup [n-1, n)$.

   (a) What is B_2?

   (b) What is B_5?

   (c) What is the closed form for B_n? (Prove your assertion by induction on n.)

   (d) What is $\cup_n B_n$?