Homework 9, Morally Due Tue Apr 16, 2013
COURSE WEBSITE: http://www.cs.umd.edu/~gasarch/858/S13.html
(The symbol before gasarch is a tilde.)

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the FINAL (give Date and Time)? If you cannot make it in that day/time see me ASAP. Join the Piazza group for the course. The codename is cmsc858.

2. (100 points) Consider the following asymmetric Can Ramsey theorem:

   Theorem: $(\forall a)(\forall k_1, k_2)(\exists n)$ for all $COL : \binom{[n]}{a} \rightarrow \omega$ there exists EITHER (a) $I \subset [a]$ and a set H of size k_1 such that H is I-homog, or (b) a RAINBOW set of size k_2. Let $ER_a(k_1, k_2)$ be the least such n that works.

   For each of the following proofs of the a-ary Can Ramsey theorem say how you would modify it to get a proof of the asymmetric a-ary Can Ramsey theorem AND what the bound would be in terms of k_1 and k_2. It should be the case that if k_1 is small and fixed and k_2 goes to infinite you get BETTER bounds then the obv proof from Can Ramsey gives.

   (a) The proof of 2-ary Can Ramsey that uses 3-ary Ramsey.

   (b) The proof of 2-ary Can Ramsey by Lefman and Rodl (the one with the best bounds.)

THINK ABOUT BUT DON'T" HAND IN:

1. The proof of Mileti that used Can Ramsey and Regular Ramsey— the $a = 3$ case and beyond.

2. The proof of Mileti that only used Can Ramsey — the $a = 3$ case and beyond. (This one was your HW).