EXTRA CREDIT PROBLEM #4
Math 6014

Prove the following generalization of Ramsey's theorem. For all integers $n, k \geq 1$ there exists an integer N such that for every $c : [\{1, 2, \ldots, N\}]^n \to \{0, 1\}$ there exist an integer $i \in \{0, 1\}$ and a set $A \subseteq \{1, 2, \ldots, N\}$ of size at least k such that $c(X) = i$ for every $X \in [A]^n$ and $|A| \geq \min A$.

Hint. Even though this is a statement about finite sets you may want to consider using the infinite Ramsey's theorem to prove it. There is a reason for it which I will explain at some point.

Instructions: Homework rules apply, including an honor pledge, except that you may collaborate with students in the same class by submitting a joint paper. A paper with k authors will earn each author $1/k$ of the credit. Only complete solutions will be accepted. To claim credit please submit a pdf file by e-mail on or before December 5.