

Due Nov 19

COURSE WEBSITE: "<http://www.cs.umd.edu/gasarch/652/652.html>"

1. (10 points) What is your name? What is your quest? What is your favorite color? What movie am I quoting here? When is the final? Where is the final?
2. (30 points) Let p be such that $0 < p < 1$. Let C be a coin that has prob p of being heads. We flip C n times. Let X be the number of heads.
 - (a) What is $E(X)$?
 - (b) What is $Var(X)$?
 - (c) Assume $p > 1/2$. Let P be the probability that $X \leq n/2$. Use Chebyshev's inequality to give an upper bound on P .
3. (30 points) Let $a, b \in \mathbf{N}$. Let $K_{a,b}$ be the complete bipartite graph with a vertices on the left and b vertices on the right.
 - (a) Assume $a \neq b$. Describe the set of automorphisms of $K_{a,b}$. How many are there?
 - (b) Assume $a = b$. Describe the set of automorphisms of $K_{a,b}$. How many are there?
4. (30 points) Show that there exists i such that $AM \subseteq \Sigma_i^p$.