Math 486: Game Theory
Assignment 12
Due Mon Dec 3

The topics for this assignment are discussed in Binmore Chapter 8. Binmore is on 2 hour reserve in the math library on the ground floor of McAllister.

1. The payoff bimatrix for the Prisoner's Dilemma is

	Dove	*Hawk*
Dove	(3,3)	(0,6)
Hawk	(6,0)	(1,1)

   Show that (`Hawk`,`Hawk`) is the unique Nash equilibrium for a finite stage game whose stage game is the Prisoner's Dilemmas, where `Hawk` is the strategy that plays *Hawk* in every stage.

2. For an iterated game whose stage game is the Prisoner's Dilemma, the `Grim` strategy is to play *Dove* in the first stage, and to continue to play *Dove* unless the other player plays *Hawk*, in which case, play *Hawk* for the rest of the game.

   Let G be the indefinite stage game whose stage game is the Prisoner's Dilemma and where, after each stage is played, the probability of playing another stage is p. What is the smallest value of p making (`Grim`,`Grim`) a Nash equilibrium?

3. Let G be the infinite stage game whose stage game is the Prisoner's Dilemma. Draw diagrams for a pair of finite state automatons, `Puff Daddy` and `P. Diddy`, that play the game G, such that

   (a) The long run average payoff vector when `Puff Daddy` plays `P. Diddy` is $(4, 2)$.

   (b) The pair of strategies (`Puff Daddy`,`P. Diddy`) is a Nash equilibrium.

   Explain why your finite state automatons satisfy the requirements (a) and (b).