Homework 2 (70pts)
For full credit, show your work.

Formatting (6pts)
Single file, in pdf format.

Definitions (8pts)

a. Informed Player
b. Mixed Strategy
c. Strictly Dominated Strategy
d. Explain why you wouldn't want to include a strictly dominated strategy in a mixed strategy.

Problem #1 Graphing Payouts When Strategies are Mixed (12 pts)

For each of the following game tables,

I. Eliminate any strictly dominated strategies. Also, state which strategy is dominated and by what.

II. Graph player 1's pure strategy payouts if player 2 uses a mixed strategy.

a)

		Player 2	
		S	T
Player 1	F	7, 3	2, 4
	G	5, 2	6, 1
	H	6, 1	5, 4

b)

		Player 2	
		X	Y
Player 1	A	2, 3	6, 1
	B	4, 2	1, 3
	C	3, 1	2, 4

c)

		Player 2		
		Left	Center	Right
Player 1	Top	3, 1	3, 1	0, 2
	Middle	1, 2	2, 1	1, 2
	Bottom	0, 2	3, 0	3, 1

Problem #2 Mixed-Strategy Nash Equilibrium (16 points)
For each of the following game tables, find all Nash equilibria.

a)

		Daffy	
		Duck	Rabbit
Bugs	Duck	-2, 1	0, 0
	Rabbit	0, 0	1, -2

b)

		Buzz	
		Bail	Drive
Jim	Bail	0, 0	-1, 1
	Drive	1, -1	-10, -10

Problem #3: States of nature (12 points)

Consider the following variant of the Prisoner's Dilemma: Guido and Luca work for a mob boss named Vito, who is unpredictable. Vito is not a player in this game, but when Guido and Luca are arrested, Vito may be Nice, with probability p, or Nasty, with probability $1 - p$. Game tables for the two states are shown below:

Vito is Nice (p)

		Luca	
		Testify	Quiet
Guido	Testify	-10, -10	0, -20
	Quiet	-20, 0	-1, -1

Vito is Nasty ($1 - p$)

		Luca	
		Testify	Quiet
Guido	Testify	-40, -40	-20, -20
	Quiet	-20, -20	-1, -1

a) First, assume that $p = 0.5$, so that Vito is equally likely to be Nice or Nasty. Combine these two game tables into one table containing Guido and Luca's expected payoffs, then find all of the pure-strategy Nash equilibria in this game.

b) Now, assume that p is unknown. Once again, combine the two game tables into one table containing Guido and Luca's expected payoffs. **(Hint: These expected payoffs will have to be written in terms of *p*.)**

c) Based on your answer to b), for what values of p is (Quiet, Quiet) a Nash equilibrium?

Problem #4 Pure Strategy Bayesian Nash Equilibrium (16pts)

Suppose player 1 knows there exists a probability distribution over states with some unknown value p, and player 2 knows which state is going to be realized.

What are the possible pure strategy BNEs? Dr. Wu (University at Oregon)

		Good (p)				Bad (1-p)	
		player 2				player 2	
		C	D			C	D
player 1	A	(2,2)	(0,0)		A	(2,2)	(4,0)
	B	(0,0)	(3,3)		B	(0,4)	(3,3)