GAME THEORY - ASSIGNMENT 3

Due date: October 10, 2016

1. **Market for Lemons.** Consider a used car market in which a car is in **good** condition with probability $q \in [0, 1]$ and and in **bad** condition with probability $1 - q$ (call such cars *lemons*). There is one buyer an one seller. The seller knows whether the the car is good or bad but the buyer does not know the quality of the car. There is a market price for every used car, denoted by p.

   The seller has two possible actions: SELL and NOT SELL. The buyer has two possible actions: BUY and NOT BUY. If the car is good, then the game in Table 1 is played. If the car is bad, then the game in Table 2 is played.

	Sell	Not sell
Buy	$6 - p, p$	0,5
Not buy	0,5	0,5

Table 1: Good car

	Sell	Not sell
Buy	$4 - p, p$	0,0
Not buy	0,0	0,0

Table 2: Bad car

   (a) Describe this as a Bayesian game.

   (b) Find the Bayesian equilibria of this game (as a function of p and q).

2. Consider a first-price auction with two bidders whose values are drawn from $[0, 1]$. Suppose the seller now posts a reserve price $r \in (0, 1)$. So, the winner is the highest bidder only if his bid is higher than r - if the highest bidder bids less than r, then the object is not allocated.

   Compute a symmetric, monotone pure strategy equilibrium of this modified first-price auction.