

## 14.12 Game Theory

Fall 2002

Problem Set 4

Due on 11/8

1. Consider the following variant of the Battle of the Sexes: player 1 is unsure whether player 2 prefers to go out with her or prefers to avoid her, while player 2 knows player 1's preferences. Specifically, suppose player 1 thinks that with probability  $\frac{1}{2}$  the game is

	<i>B</i>	<i>S</i>
<i>B</i>	2, 1	0, 0
<i>S</i>	0, 0	1, 2

and with probability  $\frac{1}{2}$  it is

	<i>B</i>	<i>S</i>
<i>B</i>	2, 0	0, 2
<i>S</i>	0, 1	1, 0

Player 2 knows which game is being played.

- (a) Model this as a Bayesian game; that is, write down the action spaces, type spaces, prior beliefs, and von Neuman-Morgenstern utilities.
  - (b) Show that player 1 playing B and player 2 playing B in the top game and S in the bottom game is a Bayesian Nash Equilibrium.
2. Gibbons prob. 3.2
  3. Gibbons prob. 3.3
  4. Gibbons prob. 3.6
  5. Gibbons prob. 3.7