ECON6110: Problem Set 5

Spring 2024

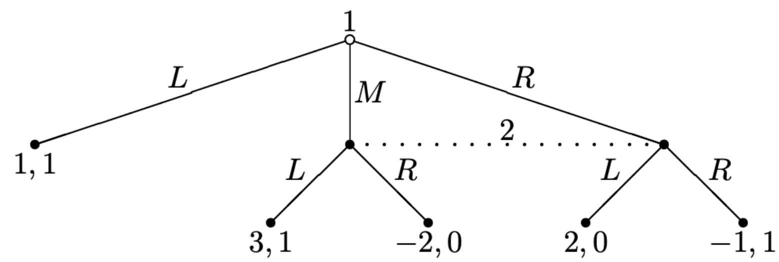
This problem set is due on April 25, 2024 at 23:59. Every student must write their own solution and submit it individually. Problem set submissions are submitted electronically and may be typed or handwritten. If handwritten, please ensure your work and scan are legible. **Illegible submissions will not be graded.**

Problem 1

Consider the following game. Initially each player puts a dollar in the pot. Then each player is dealt a card; each player's card is equally likely to be High or Low, independent of the other player's card. Each player sees only her own card. Player 1 may see or raise. If she sees, then the players compare their cards. The one with the higher card wins the pot; if the cards are the same, then each player takes back the dollar she had put in the pot. If player 1 raises, then she adds \$ k to the pot (where k is a fixed positive number), and player 2 may pass or meet. If player 2 passes, then player 1 takes the money in the pot. If player 2 meets, then she adds \$ k to the pot and the players compare cards, the one with the higher card winning the pot; if the cards are the same, then each player takes back the \$ $(1 + k)$ she had put in the pot.

Model this card game as an extensive game. Drawing a diagram is sufficient; you can avoid the need for information sets to cross histories by putting the initial move in the center of your diagram.

Problem 2



Find the set of Perfect Bayesian equilibria of the game.

Problem 3

Gilligan and Krehbiel (1988) depict the open rule in Congress as a cheap-talk game, that is, as a signaling game in which signals are costless. As a rough approximation, the committee proposes a policy, but the floor can introduce amendments and choose the policy it likes. The open rule is depicted as a two-player game, with a single member in the committee and a single representative on the floor (who stands for the median voter). The object of the decision is a policy a_2 in R. The outcome given policy a_2 is $x = a_2 + w$, where w is a random variable uniformly distributed between 0 and 1. The committee knows w; the floor does not. The committee moves first and suggests a policy a_1 to the floor. The preferences of both are quadratic with bliss points $x = 0$ for the floor and $x = x_c \in (0, 1)$ for the committee:

$$
\begin{aligned}
u_1(x) &= -(x - x_c)^2 \\
u_2(x) &= -(x)^2
\end{aligned}
$$

(a) Show that there always exists a "babbling" Perfect Bayesian equilibrium in which a_1 is uninformative and $a_2 = -1/2$.

(b) Look for informative Perfect Bayesian equilibria. In particular, find an equilibrium in which the committee "reports low" when $w \in [0, w^*]$ and "reports high" when $w \in [w^*, 1]$.