Purdue University Spring 2022

Department of Economics Professor Tim Cason

**Economics 585**

**Behavioral Economics**

**Lab Report #2**

**Due Sunday, January 23, 2022**

Note: Remember that in all of the games represented below, the lower left payoff in each cell goes to the row player and the upper right payoff goes to the column player.

1. In the first 5 periods of the experiment (periods 1-5), you played the following game against a **new opponent** in each period:

Column Player

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | Choice 1 | Choice 2 |
|  | Row | Choice 1 | 10  10 | 15  0 |
|  | Player | Choice 2 | 0  15 | 2  2 |

What is the Nash Equilibrium to this game? Explain your reasoning clearly.

1. In the second 5 periods of the experiment (periods 6-10), you played the following game against a **new opponent** in each period:

Column Player

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | Choice 1 | Choice 2 |
|  | Row | Choice 1 | 10  10 | 25  0 |
|  | Player | Choice 2 | 0  25 | 8  8 |

Although the numbers change from the first set of games you played, does the Nash Equilibrium change? Explain.

1. The choice data for your play of these games is on the class web page. How closely did your and the other students’ play of this game correspond to the Nash Equilibrium? Make a graph with period on the horizontal axis, and the number of times each period choice 2 was played on the vertical axis (separately for the first 5 and the second 5 periods). Did play correspond to the Nash Equilibrium more often in the first 5 or the second 5 periods? If there is a difference, why do you think this difference occurred? Did play get closer to the Nash Equilibrium in later periods of either sequence?
2. In the third 5 periods of the experiment (periods 11-15), you played the same game as in question 1, but against the **same opponent** across all 5 periods. Make a graph with period on the horizontal axis and the number of times each period choice 2 was played on the vertical axis for these new periods. Did the rate that the play corresponds to the Nash Equilibrium differ between the **new opponents** (periods 1-5) and the **same opponent** (periods 11-15) “treatments?” If so, why do you think this difference occurred?
3. In the next 5 periods of the experiment (periods 16-20) you played the following game against a **new opponent** in each period:

Column Player

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | Choice 1 | Choice 2 |
|  | Row | Choice 1 | 20  20 | 10  0 |
|  | Player | Choice 2 | 0  10 | 3  3 |

What are the (pure strategy) Nash Equilibria of this game? Explain your reasoning clearly.

1. In the final 5 periods of the experiment (periods 21-25) you played the following game against a **new opponent** in each period:

Column Player

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | Choice 1 | Choice 2 |
|  | Row | Choice 1 | 11  11 | 10  -9 |
|  | Player | Choice 2 | -9  10 | 3  3 |

Although the numbers change from the games played in periods 16-20, does the set of pure strategy Nash Equilibria change? Explain.

1. The choice data for your play of these later “coordination” games is on the class web page. Make a graph with period on the horizontal axis, and the number of times each period choice 2 was played on the vertical axis (separately for periods 16-20 and periods 21-25). Did play correspond to the “better” Nash Equilibrium more often in one set of periods compared to the other? If there is a difference, why do you think this difference occurred?
2. For the two coordination games shown above, which pure strategy equilibria are risk dominant and which are payoff dominant? Is there a conflict between these refinements for either game? Do you think this explains the patterns of choice *behavior*? Explain. [Hint: Wikipedia has a short and accurate description of **Risk Dominance**, and you can use the “game is symmetric” part of the *Formal definition* section.]