Homework Set 3

Due 5/26/24

Note: There are **four** problems; I've just put a lot of space in for those that like to print out the homework.

Question 1

In your own words, explain why we don't examine finite repeated games in the same depth as infinitely repeated games.

Question 2

Suppose you are working for an independent firm which advises companies what strategies they should play during repeated interaction.

When analyzing an infinitely repeated game between Kochakola and Bepis, you find that Grim Trigger can support cooperative play so long as both companies care enough about future consumption as compared to present consumption. In particular, you find that a cooperative outcome can be supported as long as $\delta_K > 0.78$ and $\delta_B > 0.81$. However, your role as a third-party mediator to the companies mandates that you use a common discount factor (representing that of society) when recommending strategies to each firm. After months of research[1], your best guess of society's discount factor is $\delta = 0.8$.

What is your advice to each company, and why? In other words, can cooperative play be supported in equilibrium (and why)?

[1]Not your research; your firm ~~*held an econ undergrad hostage*~~ hired an econ intern at a great rate to conduct the analysis.

Question 3

For each game below, do the following:

(i) Assume both players are cooperating unconditionally. Write down at least three terms for the payoff stream of each player, and write down what this (infinite) payoff stream is equal to.

(ii) Assume both players are playing Grim Trigger. Suppose player 1 deviates once, and then continues playing Grim Trigger. Write down at least three terms from player 1's payoff stream, and write down what this (infinite) payoff stream is equal to.

(iii) Assume both players are playing Grim Trigger. Suppose player 2 deviates once, and then continues playing Grim Trigger. Write down at least three terms from player 2's payoff stream, and write down what this (infinite) payoff stream is equal to.

(iv) Assume that both players share the same δ. Find the range of δ which supports cooperative play in a subgame-perfect equilibrium sense. You can assume that players will not forgive each other if someone has already defected.

(a)

		Chicken Joe: Q	Chicken Joe: S
Heihei	Q	$8, 8$	$2, 36$
	S	$36, 2$	$4, 4$

(b)

Feyre \ Tamlin	C	D
C	$50, 10$	$5, 50$
D	$100, 1$	$8, 6$

Question 4

Suppose that P_1 discounts the future by a factor of δ_1 and P_2 discounts the future by a factor of δ_2. For the following game, find the range of δ_1 and δ_2 which allows the cooperative outcome to be enforced via a Grim Trigger strategy in infinitely repeated play. Which player has to be "more patient" than the other in order to support this cooperative outcome?

Note: for this problem, please check all relevant histories.[2]

		TayTay: C	TayTay: D
Jakey Jake	C	$5, 5$	$1, 7$
	D	$8, 0$	$4, 2$

[2]That is, don't take for granted that you can ignore the "dumb" history.