Game Theory

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August 22, 2017

Administratrivia

Office Hours: Wednesday 3pm and Friday at 4pm(room J16)
Exam: 2.5 hours, 4 questions out of 4.
There will be 4 homework homework assignments.

Web page, textbooks, exam

The course web page is at
http://www.shef.ac.uk/katzman/MAS348/MAS348.htm.

Etiquette

This is a large class and to prevent descent into noisy chaos we must follow the following firm rules.

What is a Game

onsists of

of players, each having

of actions or strategies; a choice of strategies by all

Example: Prisoners' Dilemma

Alice and Bob are arrested for murder and theft, but while there is enough evidence to convict them of theft, there is not enough evidence to convict them of murder, unless one or both prisoners confess.

		Bob	
		Confess	Don't Confess
Alice	Confess	Alice: 10 years, Bob: 10 years	Alice: free, Bob: 20 years
	Don't Confess	Alice: 20 years, Bob: free	Alice: 1 year, Bob: 1 year

Lets play!

		Bob	
		Confess	Don't Confess
Alice	Confess	Alice: 10 years, Bob: 10 years	Alice: free, Bob: 20 years
	Don't Confess	Alice: 20 years, Bob: free	Alice: 1 year, Bob: 1 year

Take out a piece of paper

Optimal strategy: *Confess*.

Lets play TWICE!

		Bob	
		Confess	Don't Confess
Alice	Confess	Alice: 10 years, Bob: 10 years	Alice: free, Bob: 20 years
	Don't Confess	Alice: 20 years, Bob: free	Alice: 1 year, Bob: 1 year

Take out a piece of paper

Lets play INDEFINITELY!

		Bob	
		Confess	Don't Confess
Alice	Confess	Alice: 10 years, Bob: 10 years	Alice: free, Bob: 20 years
	Don't Confess	Alice: 20 years, Bob: free	Alice: 1 year, Bob: 1 year

You are in jail again in the same situation as before with the same partner in crime. BUT now you know that you may face exactly the same situation many times in your life: each time you get out of jail a coin is tossed and if it lands on "Heads", you'll find yourself in the same situation in 10 years, otherwise this nightmare stops.

Utility and preferences

We want to compare attractiveness of outcomes of games.

Example

Alice's utilities of 0, 1, 10 and 20 years in jail are 100, 3, 0, -1.
Bob's utilities of 0, 1, 10 and 20 years in jail are 10, -5, -10, -20.