Exam Question

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p49 2

Economics + Law 2004

B What is a 'strategy' in game theory?
(5 marks)

Explain the difference between a dominant strategy equilibrium and a Nash equilibrium.
(5 marks)

Participants in a peer-to-peer file-sharing system can either cooperate (share their files with others) or cheat (try to download from others without making any contribution themselves). Write down a possible payoff matrix for their behaviour, and identify the Nash equilibrium
(5 marks)

Is this equilibrium Pareto-efficient, and, if not, what can be done to make it so?
(5 marks)

Model answer.

First two are bookwork; see, for example, Varian ch 28. A strategy lists all the moves you'd make in response to any move by the opponent; a dominant strategy equilibrium exists when each party chooses a strategy regardless of the other's moves ('global optimum') while in a Nash equilibrium the choice is contingent on the other's choice (in some sense, 'local optimum'). 10 MARKS FOR THESE POINTS

HMO QUESTION
WHAT ALL OR NONE

Third part : classic prisoner's dilemma

A \ B	cheat	cooperate
cheat	0, 0	3, -1
cooperate	-1, 3	2, 2

Eg : value of file to downloader = 3, cost to uploader = -1 . So Nash = (cheat, cheat)

~~what's strategy?~~
~~answer is copy cat~~

Fourth part : classic fix for prisoner's dilemma is to make the game sequential, so you can play strategies such as tit-for-tat (if you served me last time, I'll serve you this time). In the P2P context this may be implemented as a distributed reputation system