Exam Performance Feedback Form

CS3192

Question 1. Almost 90% decided to answer this question. Many of them lacked in understanding of *probabilities* (which in this example arise from the draw) and how these still allow the calculation of a matrix for a game. Many were also shaky on the fact that a strategy has to have an answer to *every* situation it might find itself in. For the given question, that means a strategy has to say what the player should do if he gets a red card *as well as* what to do if he gets a black card. This question had the third highest average mark.

Reasons why marks were lost typically were:

(a) Not taking into account the draw in the game tree, forgetting to give pay-offs.

(b) Not taking into account that the players know the colour of their card before they have to make a decision (not very many), giving strategies which did include information about what to do if the player got a red card, as well as what to do if the card was black (many people tried to split this up into two strategies).

(c) Since strategies which only give an answer for one possible outcome of the draw do not make a lot of sense when it comes to playing the game, many people could not derive a sensible answer. Their matrix gave the outcome of some play, but the effect of the draw (and the resulting probabilities) was entirely ignored.

(d) On the whole students could answer this part, but some gave strategy combinations which did not lead to an equilibrium point for their matrix from (c).

(e) Some claimed mixed strategy equilibrium points were none existed for their matrix from (c). Many did not realize that 'fairness' of the game is not about perceived fairness of the rules, but whether the value indicates that one player has the advantage.

Question 2. Almost 100% decided to answer this question. Very few of them did not know what they were supposed to do and got very low marks. The vast majority did extremely well with this question. It had the highest average mark.

Reasons why some marks were lost typically were

(a) Many people forgot to give the value, losing a mark.

(b) Some people could not deal with games of more than two players. There were very few good discussions of *stability*, that is whether the players were likely to settle on one of the equilibrium points, and why.

(c) A lot of people just removed strategies without giving any reason for it, losing marks. 'Not looking like a good strategy' is not a convincing argument. Others did derive *contradictory* inequalities but decided that they could still remove the corresponding strategy from consideration.

(d) The most common mistake was mixing up the calculations for Player 1 and Player 2, another was mixing up which weight should go to which strategy.

Question 3. Only a handful of people tried this question, half of them wrote very little. For the others, the main problems were

(a) how to write down a proper proof idea;

(b) how to connect their understanding of the Minimax Algorithm with their proof from (a).

Question 4. This question was attempted by just over half the students taking the exam. It had the second highest average mark.

Marking scheme: 3 marks for giving the three main tasks, 4 marks each for a description of same, 5 marks for describing how it all fits together or indications of independent research on the issue.

Marks were typically lost because not all the main tasks were discussed, but just one or two in great detail, or because no description of how it all fits together was given.

Question 5. About half the students taking the exam chose this question. It had a low average mark. Many people got fairly low marks across the subquestions, losing marks for the following reasons:

(a) Discussing a *specific* Prisoner's Dilemma game rather than the general one. Forgetting to mention that the only equilibrium point comes from both sides defecting, or that the defect strategy dominates the cooperate one.

(b) Being unable to define *sub-game equilibrium point*. The most popular wrong answer was to say that it was an equilibrium point for some sub-game (rather than for *all* sub-games). Many people gave wrong equilibrium points for one of the game asked about (typically confusing the repeated game with the *indefinitely repeated* one).

(c) Not being able to formulate what 'best strategy' might mean, or not being able to give a proof that AlwaysD cannot be one.

(d) People often wrote about Axelrod's work (territorial systems, study of TitForTat, etc.) rather than what other people have done since.