

Choosing one out of two grading policy: A case study approach

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1. introduction

In this case we have two grading policies offered by professor and a student have choose one of them. There can be many possible grading policies for any course instructor but in this case I'm taking grading policy of prof. vimal kumar for the course ECO502A. These two grading policies are-

PLAN A

Quizzes: 0%
Paper (50%)
Midsem (20%)
Final(30%)

PLAN B

Two Quizzes: 20%
Case study (20%)
Midsem (20%)
Final (40%)

I'm going to solve this situation by game theoretical approach. As you can notice that student will appear in midsem and endsem examination because it is necessary in both the case. The problem is, what will he choose. He will be choosing either 'case study + quizzes' or paper. Here certain conditions are given-

Paper/ case study

Requirements: formulation, presentation and solution of a game of sufficient complexity/ involving ingenuity.

Approaches: Formulation of some important strategic interaction experienced/ seen/ noticed in day-to-day life, politics, business, sport, biology. Characterisation of all the solution of a game selected from the list provided by me(Prof. vimal kumar).

Conditions: student who is willing to write paper don't have to appear in quizzes. Quizzes aren't necessary for the student who is writing paper.

In order to solve this game we may assume that initially student don't have any information about case study or paper. He is indifference between these two and he don't what is good for him. But as we see that both the cases has several risks. In normal cases (specially when some don't know about paper/case study) paper writing involve more risks rather than writing a case study because paper writing are more complex. In this case paper writing has more weightage.

To solve this game I'm going to use normal form, extensive form analysis with complete and incomplete information. In this case study I will be focusing on theoretical explanation of different-different approaches and mathematical terms will be less.

If we look at the situation, we immediately find out most of the people end up writing case study. It can also be observed from EXEL sheet data of ECO502A course. I'm going to analyze this game from normal form game to extensive form game.

2. Normal form analysis of the game

We can frame this game as a normal form game after that we will analyze this game as an extensive form game. As we can see, player (student) has two choices. He should be preferring one of them more than other one. Of course, some may say that this is a one player game with two strategies and so the strategy which is more preferable should lead us to NASH EQUILIBRIUM. Player has two actions a_1 and a_2 . Where

a_1 = choosing case study and quizzes

a_2 = choosing paper writing

We have already discussed that paper writing is a time consuming process. It needs more effort than writing a case study. Paper writing requires well understanding and lot more knowledge. If we compare it with case study, it (case study) consume less time and effort. If we take an example where someone has to choose between two actions, both actions give same payoff, than, he or she will choose the action which take less effort. Of course, if some have enough knowledge to write a case study than he will able to write a case study easily and this will give him an advantage. Also, as I mention that paper writing require well understanding of the course, so, if he has studied a course very well than he will able to solve the quizzes easily. Things become more clear when we will analyze this game as extensive form game.

3. Extensive form analysis of the game

In this section, we try to model our situation in extensive form game. By using extensive form analysis we will be able to see the change in student's strategies. Here we assume that, student has two types.

Type1:- student who choose case study.

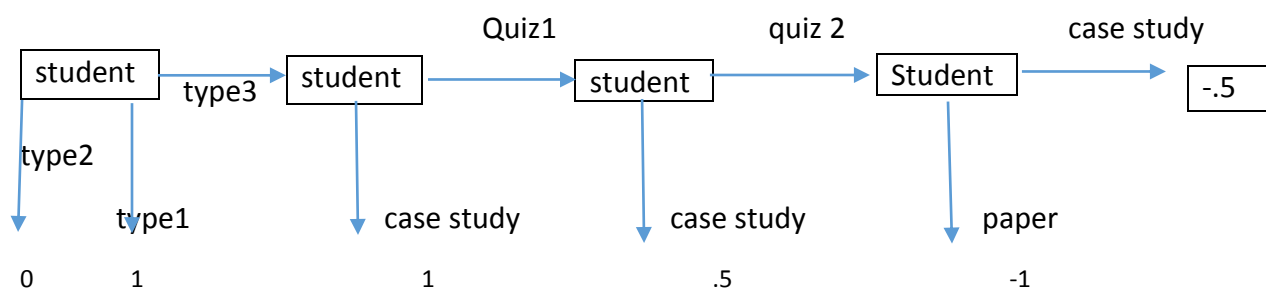
Type2:- student who choose paper.

Type3:- student who is confused between paper and case study

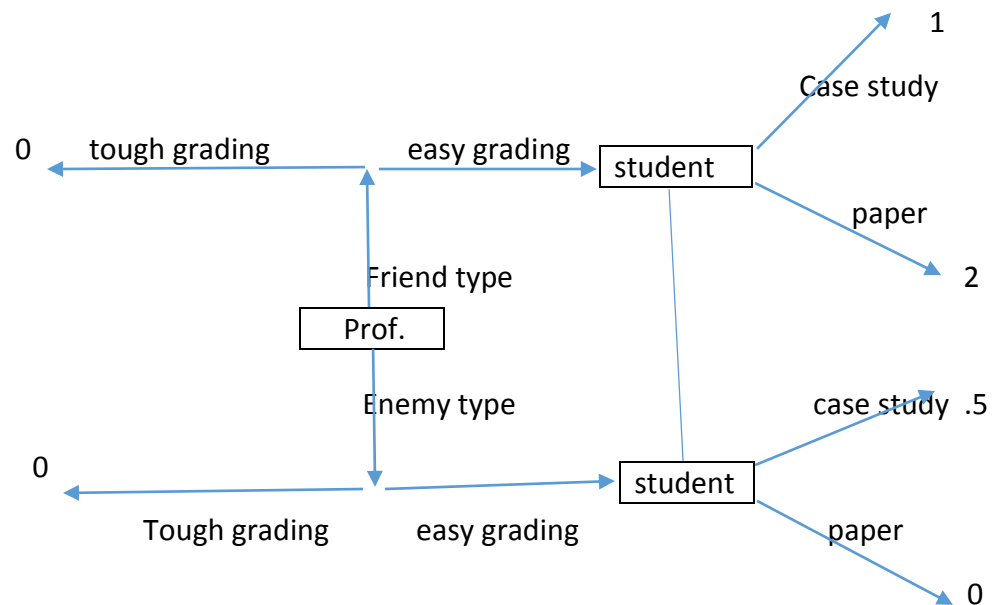
Here student has complete information about his type. Student decides his type at beginning of the game. If we look at the normal form analysis of the game than writing case study is better than writing paper. So, game ends whenever student decides to write case study and if he want to write paper than our game continue. Each time student decides whether to choose case study or further proceed into the game.

SET OF ALL POSSIBLE ACTIONS= {case study, paper, quiz1, quiz2}.

As we can see that both the cases has same weightage mid sem and end sem examinations. So, both of them will not be causing any trouble in decision making. Here everything after certain time later. As time passes, things get more and more difficult for the student. So, payoff will be less for the same action he should have taken before. The worst case is choose paper after quiz2, because, now, there no time left to think about paper writing. So, by looking at the game tree we can say that most of the students end up by choosing case study.



4. Extensive form analysis with incomplete information (taking prof. as a player)



In this prof. plays major role. We already know how to solve these kind of problems. Here, student has belief about prof., that is, either he is friendly type or enemy type and prof. can grad easy or tough in both the cases. If prof. grades tough, then payoff is 0 in both the cases, but, if, he grades easy then he will be better of choosing paper. But, player has belief about prof., that is, if he is grading type is easy type than then it is coming from friendly type. So, payoff are written in the tree by looking at all the conditions. Here we are assuming that prof. never cares about what student think about him, so, we aren't writing payoff of prof. Student has certain data about prof. that in most of cases (review from last year) prof. is enemy type. So, now student update his belief about prof. and will choose case study.

5. Conclusions:

When we were doing extensive form analysis of the game, we assumed that prof. had consistency in his behavior. This kind of analysis doesn't work with other grading policies. Some grading policies turn out so simple or some may be much more difficult to analyze. Someone may analyze this game by different methods by including more player in the game, but, final result will turn out always same. This whole analysis works for the student who don't know about case study and paper writing. Of course, if, someone has done this kind of work, then it will be easier for him to go for paper writing. Some people may give higher preference to paper writing by looking at other benefits. But, most of the cases end up with case study. In the analysis we assumed that if player had good enough knowledge of the course, then he will choose less risky option that give him highest payoff. But someone might have done opposite to that, what I meant that if had good enough knowledge then he will choose paper study. Timing sequence plays important role in this game, because we assume that if student decide to write paper study after spending half of sem, then he will ending up by reducing his grades. Whatever case we take case study still a best response to any strategy.

References:

1. Vimal kuamr, introduction to game theory, lecture slide 1.