

Essay on game theory

Profession, Student



Introduction

In the movie 21, renowned Hollywood actor Kelvin Spacey plays the role of a Massachusetts Institute of Technology professor. During the opening scenes of the movie, the professor call forward one of his students, Ben and asks him to pretend that he is participating in a game show competition. He then tells him to choose one from three closed doors. Behind two of the doors is a goat and behind the third one is a car. When the student chooses one of the doors, the professor opens one of the other doors not chosen and it is observed that there is a goat behind it.

The professor then asks the student whether he would consider changing his choice of the door or whether he would like to stick with the one previously chosen. The student changes his choice of doors and states his change of mind has been stimulated by the variable change introduced by eliminating one of the doors and thereby giving him a double chance of winning than had previously been the case ((Moehlis 3). The professor is jubilated with the student's brilliance and makes the announcement that he had indeed won the ultimate prize, the car.

This particular scenario is just one of the several scenes in the movie that brings forward the aspect of game theory and the impact it has on different situations. Game theory in itself is defined as the study that deals with decision making based on strategy. It involves the careful studying of ways by which competing agents interact strategically to produce results that are in their favor (Baird 16). It however takes a lot of skills to apply the game theory game and be able to produce results and in respect to this, not everyone is able to do it and some people don't even believe or even know

about it!

The game theory definitely applies to the 'three doors' situations in a variety of ways. The fact that the student Ben strategically chose to alter his decision in the course of the game shows that he was indeed applying the basics of game theory to make a better decision. When Ben initially chooses the first door, his chance of winning is only a third. The host in this case the professor already knew the door that had the prize. However, he was limited in terms of door that he could open since he could not open the door that Ben had originally chosen. He could also not open the door in which the car was since this would automatically end the game.

Therefore in this situation had to always open the goat door to ensure continuity of the game. Ben, being great mathematical theorist definitely understood this and that explains why he was able to make his decision so easily without really scratching his head. By switching the doors at the second time of asking, he guaranteed his chances of winning by simple application of these game theory basics.

The critical point in this particular game was the realization the host was limited in terms of the choices of the doors to be opened. Had Ben decided to stick to his initial choice of doors, it is very evident that he would have not won as the car was not actually behind the door that he had chosen in the first place. His quick strategic reasoning surely saved him on that particular situation.

The proper understanding of game theory and the laws of probability definitely gives the player an advantage when he is given the option of abandoning his previous choice and choosing an entirely different door. First

of all, as explained by Ben in his initial response to his professor, the probability of choosing the correct door at the beginning of the game is 33.3% since the car could be behind any of the doors.

At this point, Ben had completely no idea which door the car was in and his decision was totally random and not based on any mathematical aspects. However, when the first door is opened and it found that the car is not behind it, the probability of having chosen the correct door rises by a further 33.3% and goes up to 66.6% (Moehlis 7). This can be quite confusing seeing that most people would think that the chance of winning would be half since there are only two doors left.

This is however not the case because as it has been expressed earlier, there are a variety of other factors that when considered can make it possible to see that one door has clearly a higher chance of winning than the other one. The key to decoding this mystery is by properly understanding the different vices of game theory and probability (Bacharach 23).

The above illustrated movie shows that it is indeed possible to apply game theory in actual game situations and if the contestant can apply them in an effective and efficient way, he might gain the upper hand in the competition and in the process raise his total chances of winning.

Works cited

Baird, D., Gertner, R., and Picker, R. Game Theory and the Law. Cambridge, MA: Harvard University Press. 2011.

Bacharach, M. Beyond Individual Choice: Teams and Frames in Game Theory. Princeton: Princeton University Press. 2006.

Moehlis, Jeff. The Mathematics of the movie 21. Occlens Mathematics Review. 14, Sep 2011.