



GAMES AND PROBABILITIES

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There are many changes in our life. Not only the political situations has changed in the last 30 years but the teaching methods too including the teaching of probability theory and statistics. In the ancient times only the classical knowledge based teaching methods were existing, then came the New Maths waves from America followed by the competency based maths. In parallel with the development of methodology new topics arose from the national curriculums and the school books too. For example the sets, graphs, combinatorics, probability theory and statistics. These changes heavily impacted the Hungarian matriculation system and caused several problems in the life of some 'old-fashioned' school teachers too. When they were young they did not meet any of these topics or just slightly touched them. In this lecture we will deal with the probability and statistics only. However the idea of lifelong learning exists, I am just citing a quote from Henri Poincare:

"The very name of the calculus of probabilities is a paradox. Probability as opposed to certainty is what one does not know, and how can we calculate the unknown? Yet many eminent scientists have devoted themselves to this calculus and it cannot be denied that science has drawn therefrom no small advantage."

(Science and Hypothesis, Chapter 11: The Calculus of Probabilities)

Despite the theoretical or philosophical problems we want to calculate the probability of events although we are not so eminent scientists. Let us examine what kind of tools could get this topic closer to us. What can we do to decrease the reluctance of the students and teachers?

The basic idea is playing. There are some math problems which are called mathematical games by the teacher but no student would believe it is a real game. You cannot deceive the students with these games. In almost every classroom there are some students who are really enthusiastic and they really enjoy these talented games but there is no chance to catch the attention of the rest of the group..

For example we always deal with the following problem with my students:

There are three given experiments. The player must choose one of them and repeat it 20 times. He only writes down the results of the experiment. The others have to find out what was the choice of the player.

A: One throws a die and writes 0 if the result was 1 or 2, writes 1 if the result was 3 or 4 and writes 2 if the result was 5 or 6.

B: One throws a die and writes 0 if the result was 1, 2 or 3, writes 1 if the result was 4 or 5 and writes 2 if the result was 6.

C: One throws a die and writes 0 if the result was 1, writes 1 if the result was 2, 3, 4 or 5 and writes 2 if the result was 6.

After the first experiment we could got the series:

2, 2, 1, 1, 0, 0, 0, 1, 0, 1, 1, 1, 1, 2, 2, 1, 1, 2, 0, 0

Here I list some possible tasks and questions:

- Try to find out the player's choice!
- How could you make a decision?
- Could you make the correct decision after all results?

I will not answer these questions here, but I encourage you to deal with this or similar problem sets. You can find a lot of very similar questions in my colleague Tibor Nemetz's book.

As I mentioned earlier this or similar problems are really handy, nice and useful, but they are called games only by the teachers.

Every student can see and meet with real games in movies or even in TV series. Like in the Ocean's Thirteen with a lot of stars in it, the Las Vegas (TV series), The good old film Casino with Robert de Niro and Sharon Stone rated 8.2 by IMDb (Internet Movie Database), or an even newer but worse example is What Happens in Vegas with Ashton Kutcher and Cameron Diaz (it has got only mark 6 on Imdb). Last but not least I would mention the Indecent proposal with Demi Moore and Robert Redford. And I could not complete the list but there are a lot of other films with real games in it and your students are for sure familiar with them. Nowadays poker, roulette, blackjack, or the Craps and slot machines are very popular too.

If I 'google' the word "casino games" I get approximately 15 900 000 hits in the browser.

In the next part of the lecture we will deal with the games with two dice called Craps. It is easily understandable and quite easy to calculate the odds of it. But before we would calculate anything we would watch some scenes from the above listed films. After the movies we can calculate the chances in the classrooms and we can play the real game.

Eventually why do we play craps?

- It is enjoyable.
- There are only a few rules.
- There is a tense while you are playing and you do not have to be a millionaire.

Be careful! I would suggest rather be prepared! There are no fair games in casinos!

We will calculate the probability of some events of Craps like basic bet and other variations of it.

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