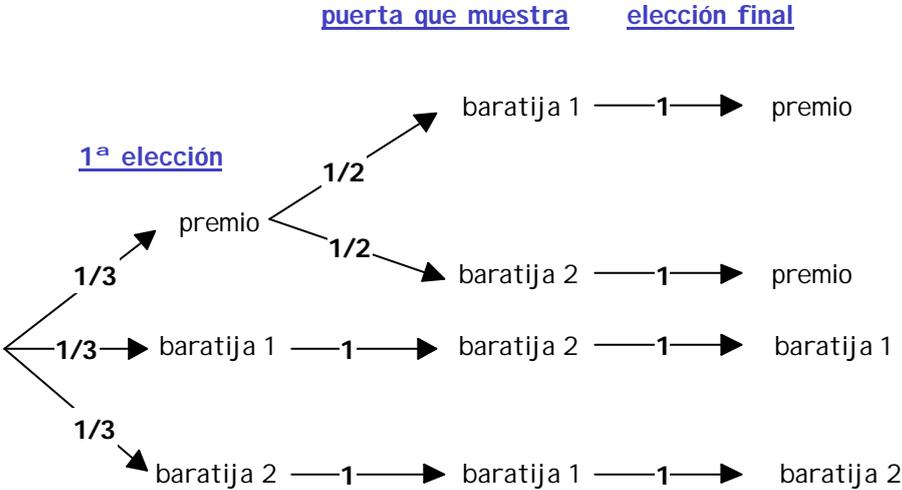


THE THREE DOORS-2

If you want to know some more...

Simulating a high number of times the experience and analyzing the results, you have been able to solve the problem 'experimentally'. Now you are going to try to do it theoretically. For it, you will have to study the possible results in a trial, according to each of the options, to analyze the probabilities of each possible result and, finally, to calculate the probability of the possible favorable results.

?? In the first option (to keep the initially chosen door), the following diagram clearly shows what can happen. The number that appears on each branch indicates the probability that that event can happen, when it has previously happened to reach that branch.

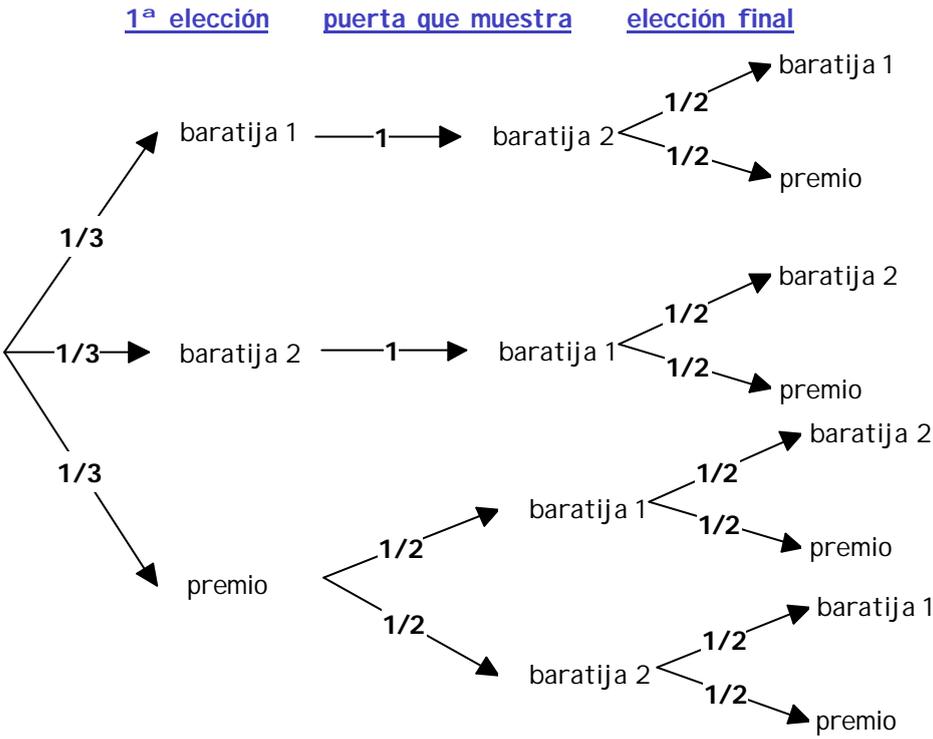


(door that is shown - final election - prize - knickknack)

Each path (for example in the first selection he chooses the prize, the door with knickknack 2 is shown, and finally he gets the prize) represents a possible elementary result, the probability of getting this result is $1/3 \times 1/2 \times 1 = 1/6 \approx 0.167 \approx 16.7\%$

Which probability has he got of getting the prize if he keeps the first choice?

?? If in the second selection he chooses at random between the two doors still closed (the initially chosen and the other one):



(door that is shown - final election - prize - knickknack)

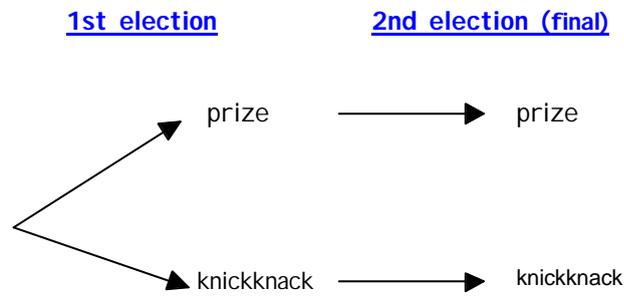
Which probability has he got of getting the prize in this second option?

?? Make the tree diagram for the third option and determine then the probability of getting a prize if the contestant changes the initially chosen door for the one still closed.

Is there much difference between the theoretical results and the experimental ones?

How you could achieve that the experimental results were still closer to the theoretical ones?

The tree diagrams displayed are very exhaustive. This is not always necessary and they are possible to be remarkably simplified if, instead of considering everything that can happen, I only include what I am interested in observing. Thus, the first option (to keep the initially chosen door) could be like this:



Indicate the probability of each branch in the previous diagram tree and, finally, calculate the probability of getting a prize.

Do tree diagrams as well corresponding to the options 2nd and 3rd and calculate the probability of getting a prize in each case.

YOU WILL NEED:
A pencil and a blank sheet.