THE THREE DOORS-1

Some years ago (your parents will surely remember it) there was a TV contest in which one of the trials was to choose one door among other three. Behind one of them there was a great prize, but behind the other two there were just knickknack.

The contestant started by choosing one of the three doors. Once done, the presenter opened one of the rejected doors, in which there always was knickknack. Then, he proposed the contestant the following question: 'I am going to grant you a new opportunity. You can keep your choice or, if you prefer, you can change the door you chose for the other that is still closed'.

If you were the contestant, which of the following strategies do you think is better to get the prize?

&✍Keep the door previously chosen.

&✍Chose again, by random, between the two doors still closed.

&✍Change the previously chosen door for the one still closed.

Most people don't notice that this situation can be mathematically analyzed, and that, in a probabilistic case like this one, intuition is not confirmed quite often by mathematical results.

If, as it happens with Lotto (although this case is a pure deceit, since any result can appear with equal probability and chance does not have memory), we had information on the results of many trials (option taken by the contestant and obtained result, prize or knickknack...) we could, basing on them, give a much more trustworthy answer.

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Since we cannot repeat infinitely the trial, it will be enough simulating it:

- ✍✍Simulate the trial 20 times each one, in the case the contestant keeps the initially chosen option, thanks to the simulator you have. In order to choose the door you throw a dice: if you get 1 or 2 you choose door A, if 3 or 4 door B and if 5 or 6 door C.

- ✍✍Simulate now the trial 20 more times, in the case the contestant choose at random among the two closed doors in the second election. To make the second election, throw the dice again: if you get evens, you will keep the initially chosen door, and if odds, you will change it for the other still closed.

- ✍✍Finally, make the trial 20 times, in the case the contestant changed the chosen door for the other one closed in the second election.

Record your results in the statistic boards:

Option 1: I keep the initially chosen door

Pupil	# of trials	# of success	Accumulated values	
			# of trials	# of success
	20		20	
	20		40	
	20		60	

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Option 2: I choose at random

Pupil	# of trials	# of success	Accumulated values	
			# of trials	# of success
	20		20	
	20		40	
	20		60	

Option 3: I change for the closed door

Pupil	# of trials	# of success	Accumulated values	
			# of trials	# of success
	20		20	
	20		40	
	20		60	

a) Considering each of the individual results, which do you think it would be the best option?

b) And if you consider the accumulated results, which would be the best option?

c) What probability of success (measure of the possibility of getting the prize) do you think the contestant has, according to each of the possible options?

d) To simulate the experience you have used a simulator that reproduces quite accurately the trial. Nevertheless, if you think about what you have done, you will surely think of how to simulate the experience with no need of using the simulator. If it is so, say how you would do it.

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YOU WILL NEED:

The board of the game, a dice for each one, a pencil and a blank sheet to copy down the boards you have to complete.

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