Project #1: Part #2

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Before embarking on this project, go to Wikipedia: the Monty Hall problem. This Wikipedia entry contains the description of the original Monty Hall problem as well as its analysis and variations.

Problem #1. (10 points)

Read and understand the description of the original Monty Hall game. Now, write down your own description in your own words. Resist the temptation to copy-paste from an external resource since that will earn you zero points. It might help to imagine that you have a five-year old niece or nephew you are describing the game to.

Problem #2. (10 points)

Write and execute code in `R` which will represent **one round** of the original Monty Hall game. More precisely, it should do the following:

- "choose" at random behind which door the prize will be,
- "choose" at random the door that the contestant picks,
- choose which door the host will open,
- determine whether it was optimal to **switch** or **stick** for this particular round and return this determination.

Problem #3. (10 points)

Write and execute code in `R` which repeats 100 rounds of the Monty Hall game. For which proportion of these rounds was it optimal to **switch**? *Hint:* If you answer to the previous problem was not in the form of a function, make it so now.

Problem #4 (10 points)

Write and execute code in `R` which repeats n rounds of the Monty Hall game for $n = 100, 110, 120, ..., 10000$. For each n, your code should record the proportion of individual rounds for which it was optimal to **switch**. In `R`, plot this recorded proportion as a function of n. Does your computational result agree with the analysis available at Wikipedia: the Monty Hall problem? Why? It might also be useful to consult: Wikipedia: The Law of Large Numbers.