

### Monte Hall problem

*You are a contestant on a game show and you're given the choice of three doors. Behind one door there is a car and behind the other two doors there are goats. You pick a door, say No. 1. The host, who knows what's behind all three doors, always opens another door that he knows hides a goat, say No. 3. He then makes you an offer, "Do you want to pick door No. 2 or stay with No. 1?" Is it to your advantage to change your selected door or to stay with your first choice?*

(From [https://en.wikipedia.org/wiki/Monty\\_Hall\\_problem](https://en.wikipedia.org/wiki/Monty_Hall_problem))

### Description

Write a program that runs a simulation demonstrating the solution to the Monte Hall problem, which states that as a contestant it is always to your advantage to switch your original door choice. Demonstrate that contestants who switch doors have a 2/3 chance of winning the car while those who stay with their original choice have a 1/3 chance of winning.

### Requirements

- Define a function named `simulate()` that runs a complete simulation, including at least 100,000 random trials. This function should declare at least two variables named `nstay` and `nswitch`.
- Define a function named `play()` within `simulate()`. This function will run one trial of the Monte Hall simulation and increment either `nstay`, if it was to the contestant's advantage to stay with her original door choice, or `nswitch`, if it was to the contestant's advantage to switch to the remaining door.
- The `play()` function should implement these steps:
  1. Generate a `doors` Array containing the strings, "goat", "goat", and "car" in a random order.
  2. Randomly choose one of the three doors and note door number as contestant's original selection.
  3. Find a "goat" in the remaining two unselected doors. This door is now effectively opened and can no longer be selected.
  4. Find the index of the remaining unselected-unopened door.
  5. If the "car" is behind the originally selected door, it is to the contestant's advantage to stay with her original door selection. Increment the `nstay` variable.
  6. If the "car" is behind the unselected-unopened door, it is to the contestant's advantage to switch away from her original door selection. Increment the `nswitch` variable.
- Run at least 100,000 iterations of `play()`.
- Compute and print final fractions by dividing `nstay` and `nswitch` each by the total number of iterations performed.
- Kick off the simulation by invoking `simulate()`.

### Hints

- See [random](#), [splice](#) and [push](#).

### Finishing Up

- You MUST enter header comments into you JavaScript file including (1) File name, (2) Your name, (3) Description and or purpose of the assignment.
- You MUST comment you code, explaining what you did in each section.
- Submit your single JavaScript file using Canvas under the appropriate assignment name.