

Simulation modeling in Renque

The game show dilemma

This document describes the Renque model [GameshowDilemma.zip](#). This model presents a classic probability puzzle, which is known as the game show dilemma. In a certain game show, a contestant is presented with three doors. Behind one of the doors is a valuable prize. Behind the other doors is nothing. The contestant is asked to choose one of the three doors. After the contestant has made a choice, the game show host opens one of the two other doors to demonstrate that there is nothing behind it. Subsequently, the contestant is given the opportunity to switch to the remaining door. What should the contestant do: Switch or stay? (Source: http://en.wikipedia.org/wiki/Monty_hall_problem)

The contestant obviously has a 33% chance of winning the prize if he or she sticks with the initial choice. The enclosed file contains a Renque simulation model for the alternative door switching scenario. The model runs continuous trials of the experiment. Running the model for a few seconds will reveal that the chance of winning the prize is increased by a factor of 2 if the contestant does make the switch. Watching the animation closely reveals the reason: If the initial choice is correct the contestant loses, because of the switch that follows. If the initial choice is false the contestant wins, because he always changes to the door which conceals the prize. Hence a chance of 2/3 to win versus the 1/3 chance without switching.

Some notes on the model:

When the model is opened there are two visible layers. The layer named Ani_Contestant shows what the contestant 'sees'. The layer named Ani_GameHost shows the location of the prize. The model has one more layer, which has been hidden. This layer is named SimControl and performs the actual simulation. Make this layer visible by clicking the layer tool at the left-bottom of the model window to examine how the simulation works.