**100 Prisoners**

**Overview:**

* 100 prisoners are individually number 1 to 100.
* A room having a cupboard of 100 opaque drawers number 1 to 100, that can’t be seen from the outside.
* Cards numbered 1 to 100 are placed randomly, one to a drawer, and the drawers are all closed at the start.
* Prisoners start outside the room
  + They can decide some strategy before entering the room.
  + Prisoners enter the room one by one, can open a drawer, inspect the card number in the drawer, then close the drawer.
  + A prisoner can’t open more than 50 drawers.
  + A prisoner tries to find their own number.
  + A prisoner finding his own number is then held apart from the others.
* If all 100 prisoners find their own numbers, then they will all be pardoned. If any don’t then all sentences stand.

**Task:**

1. Simulate several thousand instances of the game where the prisoners randomly open drawers.

2. Simulate several thousand instances of the game where the prisoners use the optimal strategy mentioned in the Wikipedia article of:

* First opening the drawer whose outside number is their own prison number.
* If the card within has their number then they succeed, otherwise they open the drawer with the same number as that of the revealed card (until they open the max).

Show and compare the computed probabilities of success for the two strategies.

**Results:**

Running 1 million iterations of each strategy yielded a 0.00% probability of success, while running the optimized strategy above yielded between 2.60% and 2.70% probability of success.