Stochastic Processes

Summer Semester 2026, Exercise 1

In-class discussion, Tuesday, April 21

1. A shopkeeper says she has two new baby beagles to show you, but she doesn't know whether they're male, female, or a pair. You tell her that you want only a male, and she telephones the fellow who's giving them a bath. "Is at least one a male?" she asks him. "Yes!" she informs you with a smile. What is the probability that the other one is a male?[1]

2. A shopkeeper says she has two new baby beagles to show you, but she doesn't know whether they're male, female, or a pair. You tell her that you want only a male, and she telephones the fellow who's giving them a bath. "Is at least one a male?" she asks him. "Yes, *the one he is holding just now is a male*!" she informs you with a smile. What is the probability that the other one is a male?

3. Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say #1, and the host, who knows what's behind the doors, opens another door, say #3, which has a goat. He says to you, "Do you want to pick door #2?" Is it to your advantage to switch your choice of doors?[2]

4. Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say #1, and the host, *being unattentive for the split of a second, slips and accidentally open another door*, say #3, which has a goat. He says to you, "Do you want to pick door #2?" Is it to your advantage to switch your choice of doors?

[1] `https://en.wikipedia.org/wiki/Marilyn_vos_Savant#%22Two_boys%22_problem`
[2] `https://en.wikipedia.org/wiki/Marilyn_vos_Savant#Monty_Hall_problem`