$$P(A) = \frac{\#\text{ times } A \text{ happens}}{\#\text{ of experiments}} \text{ as}$$

# of experiments goes to ∞

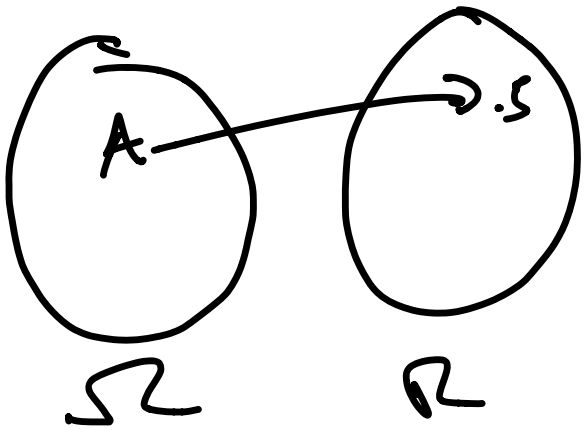
H T T H H $\longrightarrow \infty$

100% 50% 33% 50% 60% 50%

$P(A) = .5$ that means if we run ∞ experiments, then 50% we will see A occur

"frequentist view"

How do we interpret $P(A)$?



← Grace's formal math answer

Bayesian view

P(A) reflects your belief of how likely outcome A is to occur (based on data)

{P(A)}

H H T T T H

100% 100% 66% 50% 40% 50%

Conditional Probability

$P(A \mid B)$ = Probability of event A, given that you know event B has already occurred

$P(\text{Snows today} \mid 100^\circ \text{ yesterday})$

P(snows today | snowed yesterday)

P(lung cancer | smoker) vs
P(lung cancer | non smoker)

"given"

P(C | D) = "The probability of C given D"

P(outside | go play)

go play ?

go play video games

go play on the swings

"condonditioned on go play"

$$P(I \mid C) = ? \quad \frac{\text{1 info major}}{\text{1 person}} = 1$$

$$P(I \mid N) = \frac{\text{1 info majors}}{\text{2 Non Colorado}} = \frac{1}{2}$$