Conditional Probability: Fundamentals: Takeaways

Concepts

- The probability of an event A can be updated based on the occurrence of another event. The probability that A occurs *given* that B occurs is denoted as P(A|B) and is called the **conditional probability** of A with the condition that B occurs.
- We can calculate P(A|B) using a formula written in terms of set cardinals:

$$\begin{equation} P(A\ |\ B) = \frac{\text{card(A} \cap \text{B)}}{\text{card(B)}} \end{equation}$$

- Another way to calculate P(A|B) consists of using a formula written in terms of probabilities (this is useful when we only know probabilities):

$$\begin{equation} P(A\ |\ B) = \frac{\text{P(A} \cap \text{B)}}{\text{P(B)}} \end{equation}$$

- Both formulas above lead to the same result:

$$\begin{equation} P(A|B) = \frac{card(A \cap B)}{card(B)} = \frac{P(A \cap B)}{P(B)} \end{equation}$$

Resources

- An easy intro to some basic conditional probability concepts
- A more technical convey of conditional probability