Probability Rules: Takeaways

Concepts

- In probability theory, the outcomes of a sample space are typically represented as a **set**. A set is a collection of *distinct* objects, which means that there cannot be duplicate outcomes in a sample space.
- Events can also be represented as sets and can be understood as subsets of the sample space.
- Mutually exclusive events can't happen at the same time — if one of the events happens, the other cannot possibly happen and vice-versa. The events "a coin lands heads" and "a coin lands tails" are mutually exclusive — it's impossible for a coin to land both heads and tails.
- We use the addition rule for calculating the probabilities of unions and intersections. We have to keep in mind if the events are mutually exclusive, and correct for it if they aren't.

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Resources

- The addition rule for three events
- A good and short introduction to sets
- A nice and short tutorial that bridges sets with Venn diagrams