Estimating Probabilities: Takeaways ⤴

Syntax

- Simulating a coin toss using R:

```r
set.seed(1)

coin_toss <- function() {

    toss <- runif(1)
    if (toss <= 0.5) {
        return("HEADS")
    } else {
        return("TAILS")
    }
}
```

Concepts

- A **random experiment** is any process for which we can't predict outcomes with certainty. Examples of random experiments include: the toss of a coin and the rolling of a die.

- When we calculate the probability of an event under the assumption that the outcomes have equal chance of occurring, we're calculating the **theoretical probability** of an event.

- The theoretical probability formula only works under the assumption that all outcomes in the sample space have an equal chances of occurring.

- When we calculate the probability of an event by performing an experiment, we calculate the **empirical probability** of the event.

- Generally, for any event , we can calculate its empirical probability by using the following formula:

- The Law of Large Numbers states that the empirical probability of an event will approach the theoretical probability value as the number of random experiments used increases

Resources

- [An easy intro to some basic probability concepts](#)
- [Tutorial: Basic Statistics in Python — Probability](#)