Homework 6

1. Flipping a fair coin N times.
   1. given that

If we change this into terms of a random variable F where .

Then we get:

Which equals

* 1. given that

using

We get

Then:

* 1. given that

using

We get

And if we use

We get

To find the probability we add the two:

1. Textbook Problem 6.3

Standard error can be calculated using:

Substitute the known values:

* 1. B

To estimate that we just need to set SE = 0.5 and solve the SE equation for n:

Therefore you would have to repeat it 84 times.

* 1. Textbook Problem 6.4
     1. Give 68% confidence interval

First lets find the standard error

To find the confidence interval of 68% we need to use the mean 1 standard deviation. So,

Therefore the confidence interval is

* + 1. Give 80% confidence interval

The first thing we need to calculate is how many standard deviations 80% is. Using a Z table we find it is 1.28. Then:

Therefore the confidence interval is

* 1. Kind of textbook problem 6.5

We could use a t-distribution, the degrees of freedom for a t-distribution is calculated with this equation:

Where n is the sample size, so in our case df = 9

1. Textbook Problem 6.6

Before we continue let's calculate the proportion of female births and male births.

The SE for female births is:

We can use that SE to calculate the CI for female births:

So,

* 1. B

The SE for malebirths is:

We can use that SE to calculate the CI for female births:

So,

* 1. C

Yes, the intervals do overlap. This suggests that our estimates might not be entirely accurate and we might need a larger sample to be accurate. The male and female births might be closer to each other.

1. Textbook Problem 6.8
   1. A

The confidence interval is

so,

* 1. B

The confidence interval is

so,

* 1. C

They do not overlap meaning there is a difference between the flavanoids in the two regions.