Module 4 synchronous class code (for class)

Video code and additional template code can be found in the 'Big Doc of Sample Code'. Use that link to pull the file in, it will be called STA130-F21-module-4-extras.

In this code demo, we are going to work through a test for one proportion.

1. State your hypotheses

2. Calculate your test statistic (real world)

2A. Load `tidyverse` and data

```
library(tidyverse)
```

2B. Save an object that says how many observations are in our sample data

2C. Calculate the test statistic

3. Simulate under the null hypothesis

3A. Set values for simulation

3B. Automate simulation with a `for` loop (simulation world)

3C. Turn results into a data frame so we can use ggplot for plotting

4. Evaluate the evidence against the null hypothesis

```
# the value from your null hypothesis
hypothesized_value <- ______

ggplot(sim_tibble, aes(x = simulated_statistics)) +
  geom_histogram(bins = 30, colour = "black") +
  labs(x="Proportion of students picking C", y="Count",
       title = "Simulated sampling distribution under the null hypothesis") +
  geom_vline(xintercept = hypothesized_value - abs(test_stat-hypothesized_value),
             colour = "red") +
  geom_vline(xintercept = hypothesized_value + abs(test_stat-hypothesized_value),
             colour = "blue") +
  theme_minimal()
```

5. Make a conclusion

Strength of evidence conclusion

What type of error are we at risk of making if we use a significance level of 0.1?

Some guidelines for how small is small? This table tells you how to comment on the **strength of evidence against** H_0.

P-value	Evidence
p-value > 0.10	no evidence against H_0
$0.05 <$ p-value < 0.10	weak evidence against H_0
$0.01 <$ p-value < 0.05	moderate evidence against H_0
$0.001 <$ p-value < 0.01	strong evidence against H_0
p-value < 0.001	very strong evidence against H_0