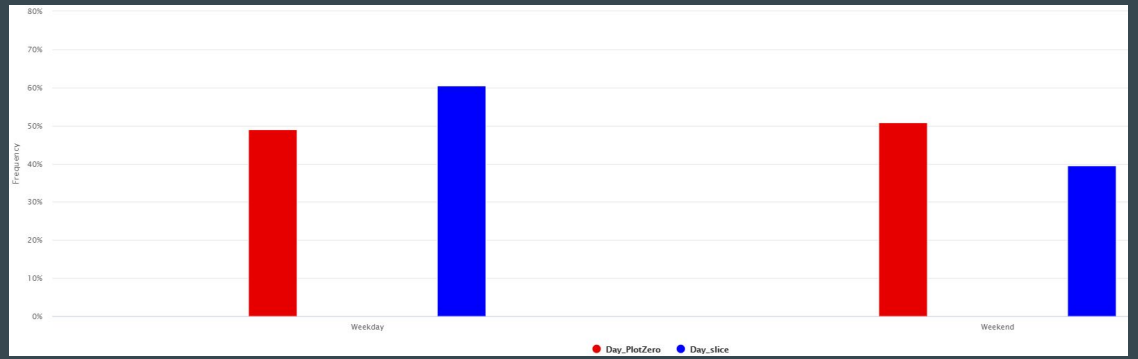
Market Data

By: Rohit Manjunath

Day - Princeton & Popcorn

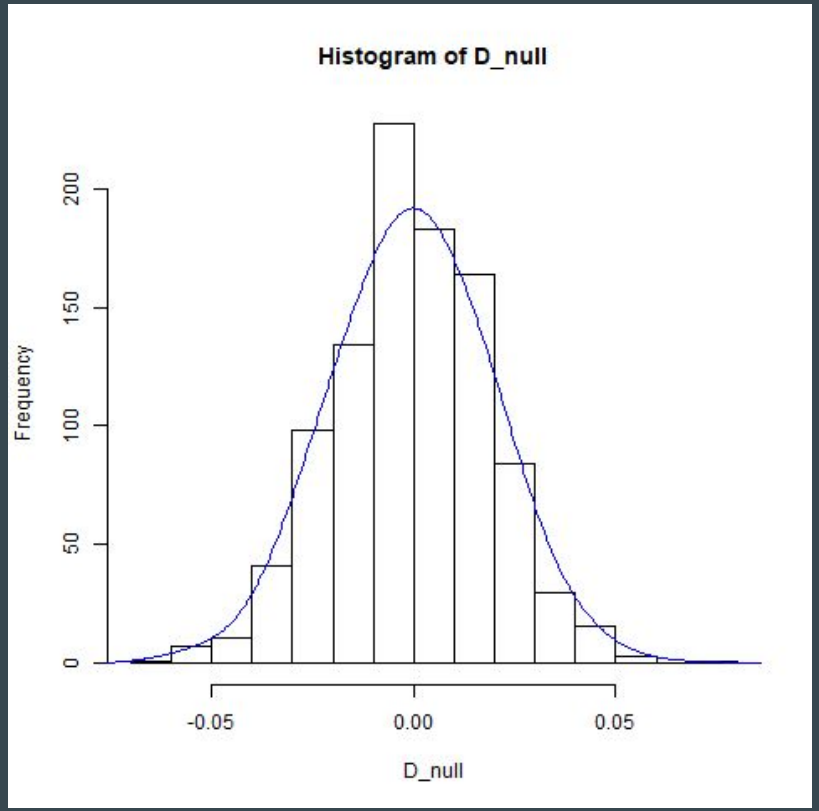
- The blue bar is a subset of:
  - Location = Princeton
  - Snacks = Popcorn
- **Alternate Hypothesis**: As you can see on weekdays people in Princeton are more frequent buyers of popcorn than on the weekends.
- **Null hypothesis**: There is no difference in the amount of popcorn bought on weekdays and weekends by people in Princeton.



Attribute: Day ; Slice Number: 1 ; Total Number of Bar Graphs = 71

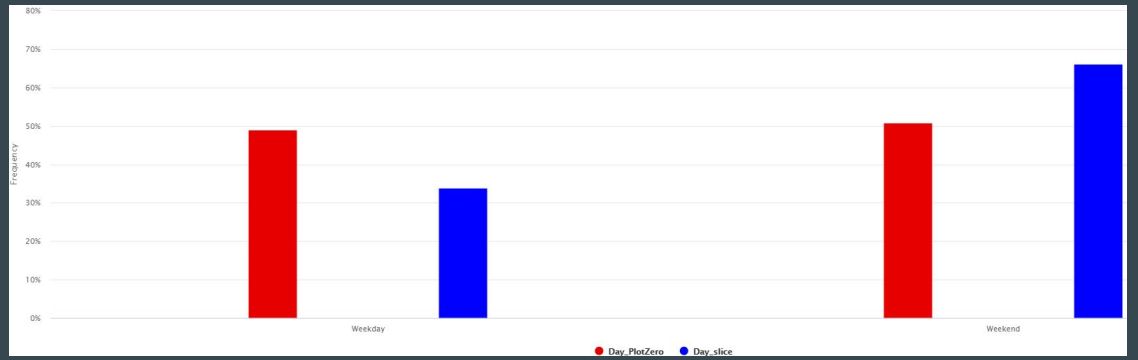
- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 71(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Day - New Brunswick & Crackers

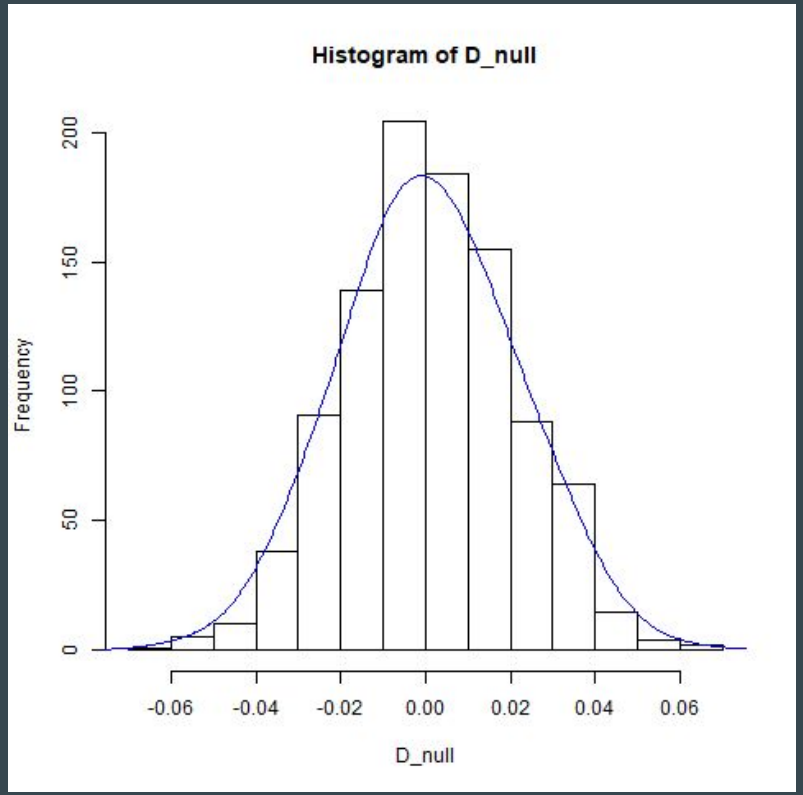
- The blue bar is a subset of:
  - Location = New Brunswick
  - Snacks = Crackers
- **Alternate Hypothesis**: As you can see on weekends people in New Brunswick are more frequent buyers of crackers than on the weekdays.
- **Null hypothesis**: There is no difference in the amount of crackers bought on weekdays and weekends by people in New Brunswick.



Attribute: Day ; Slice Number: 3 ; Total Number of Bar Graphs = 71

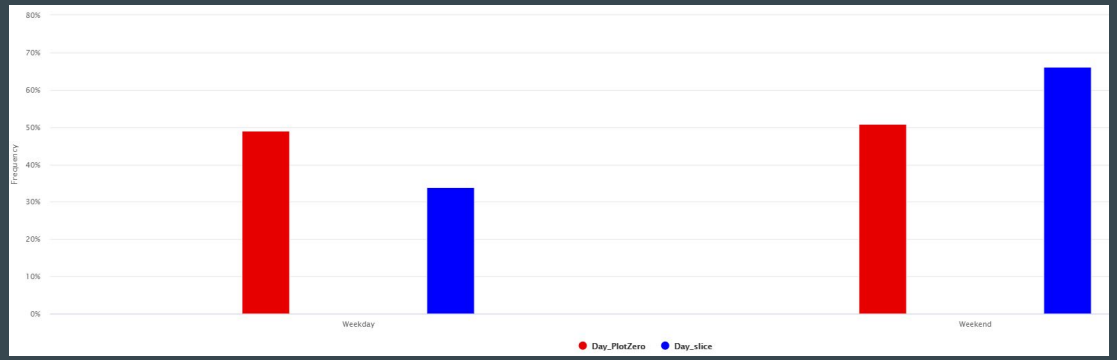
- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 71(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Day - New brunswick & Pretzels & Lager

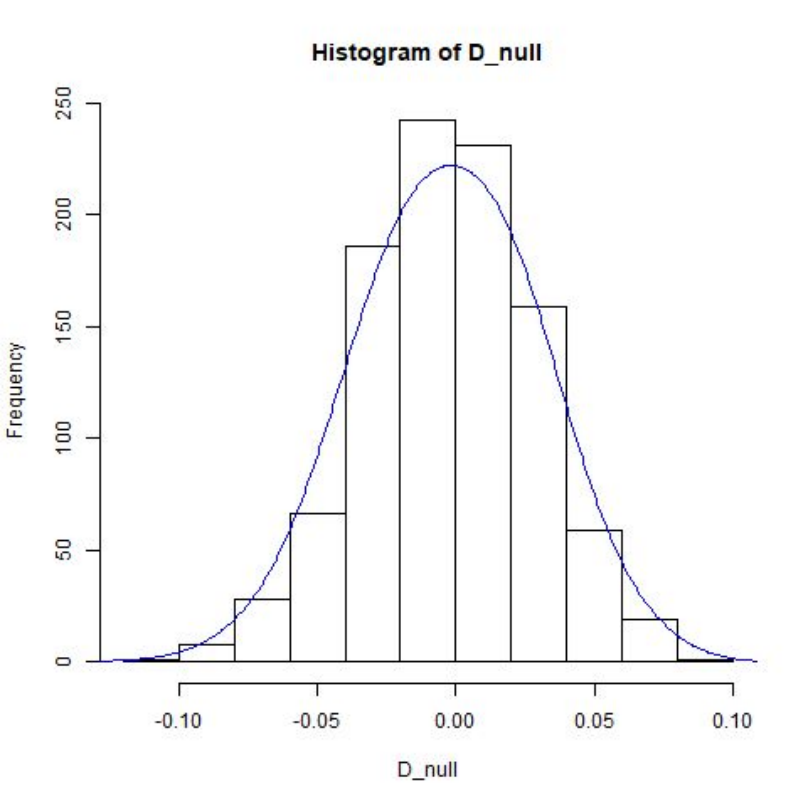
- The blue bar is a subset of:
  - Location = New Brunswick
  - Snacks = Pretzels
  - Beer = Lager
- **Alternate Hypothesis**: As you can see on weekends people in New Brunswick are more frequent buyers of pretzels and lager(together) than on the weekdays.
- **Null hypothesis**: There is no difference in the amount of crackers and lagers bought together on weekdays and weekends by people in New Brunswick.



Attribute: Day ; Slice Number: 10 ; Total Number of Bar Graphs = 71

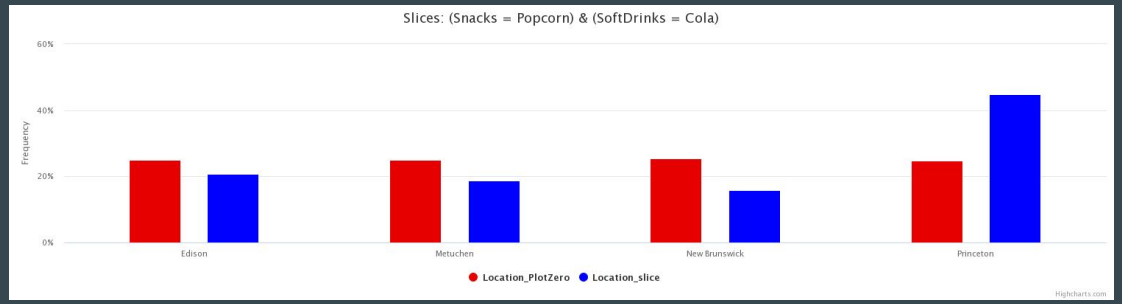
- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 71(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Location - Popcorn & Cola

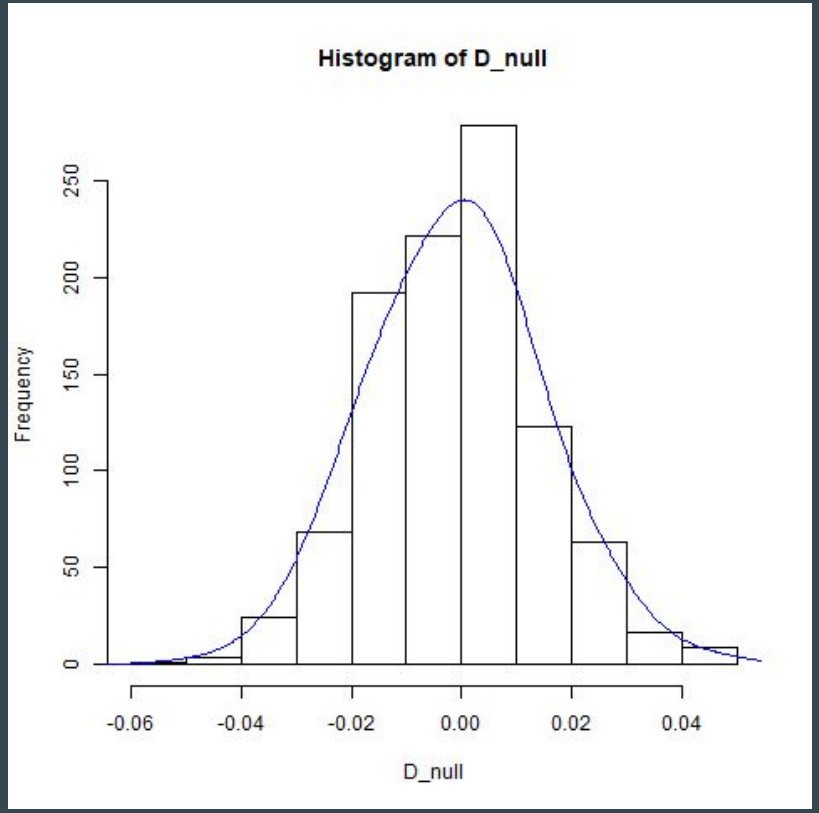
- The blue bar is a subset of:
  - Snacks = Popcorn
  - Soft Drinks = Cola
- **Alternate Hypothesis**: As you can see people in Princeton are more frequent buyers of popcorn and cola(together) than in other locations.
- **Null hypothesis**: There is no difference in the amount of popcorn and cola bought together in Princeton and other locations.



Attribute: Location ; Slice Number: 13 ; Total Number of Bar Graphs = 279

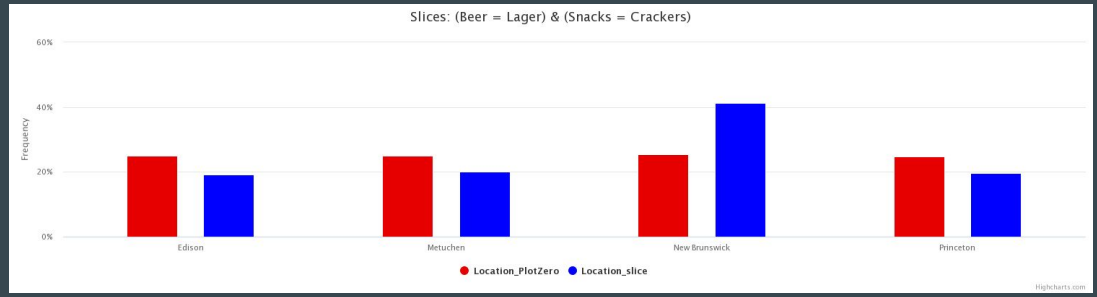
- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 279(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Location - Lager & Crackers

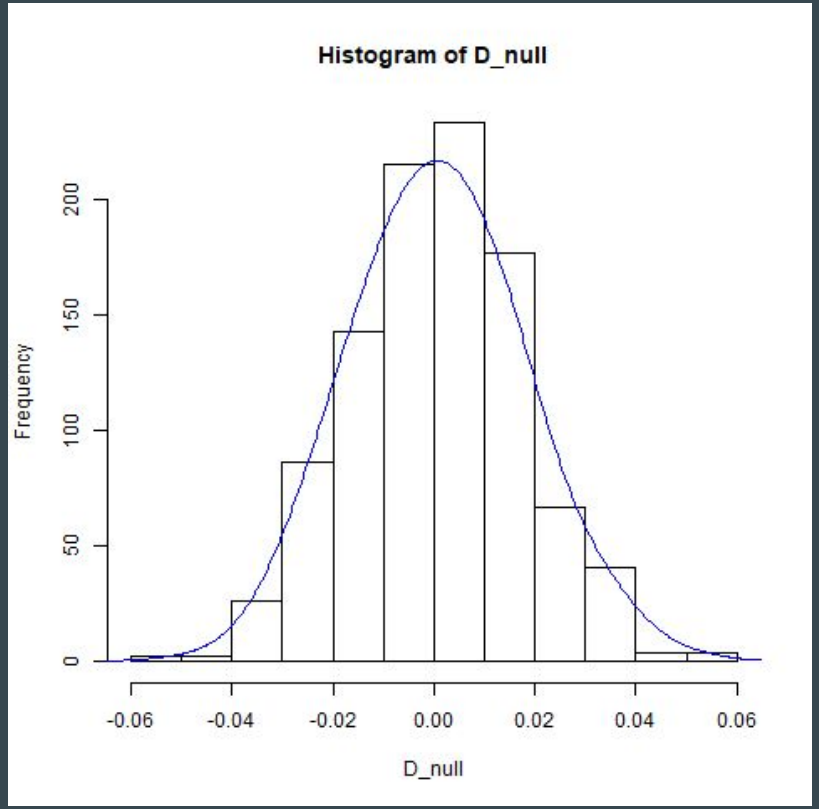
- The blue bar is a subset of:
  - Snacks = Crackers
  - Beer = Lager
- **Alternate Hypothesis**: As you can see people in New brunswick are more frequent buyers of crackers and lager(together) than in other locations.
- **Null hypothesis**: There is no difference in the amount of crackers and lager bought together in New Brunswick and other locations.



Attribute: Location ; Slice Number: 21 ; Total Number of Bar Graphs = 279

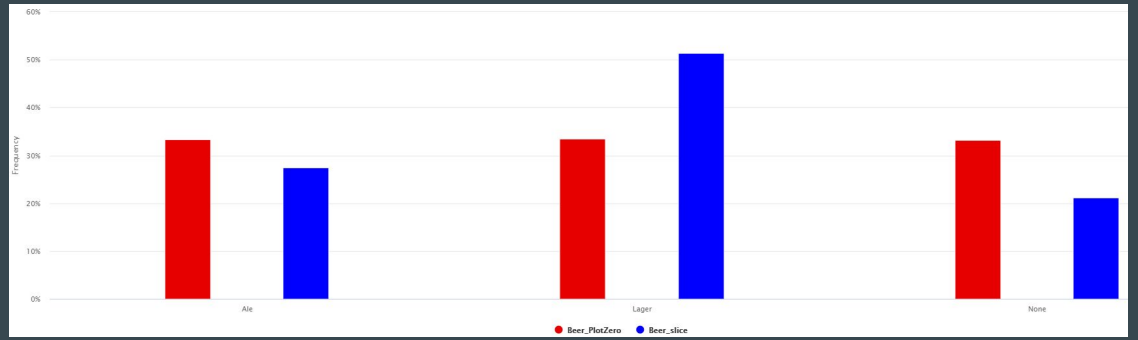
- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 279(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Beer - Potato Chips & New Brunswick & No Wine

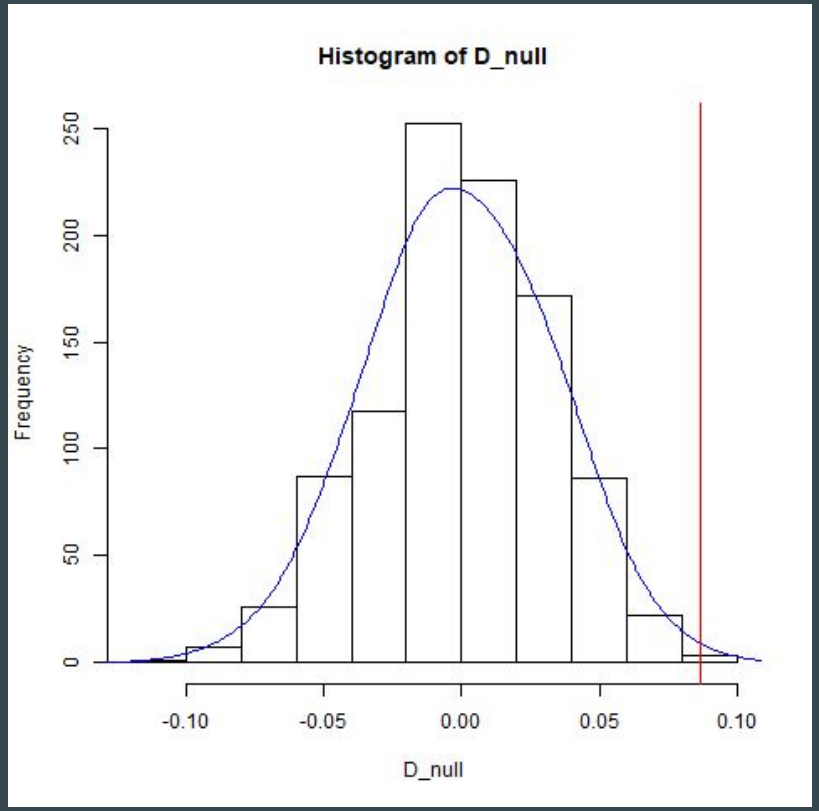
- The blue bar is a subset of:
  - Location = New Brunswick
  - Snacks = Potato Chips
  - Wine = None
- **Alternate Hypothesis**: As you can see people that buy Lager are more frequent buyers of potato chips and no wine(together) in New Brunswick than other types of beers.
- **Null hypothesis**: There is no difference in the amount of potato chips and no wine bought together in New Brunswick along with lager compared to other beers.



Attribute: Beer ; Slice Number: 48 ; Total Number of Bar Graphs = 157

- Running a permutation test on this gives us a value of 0.008.
- The Bonferroni correction would be 0.05 / 157(Total number of bar graphs). 0.008 is greater than the required threshold. Hence, we **fail to reject** the null hypothesis.

Permutation Test Result

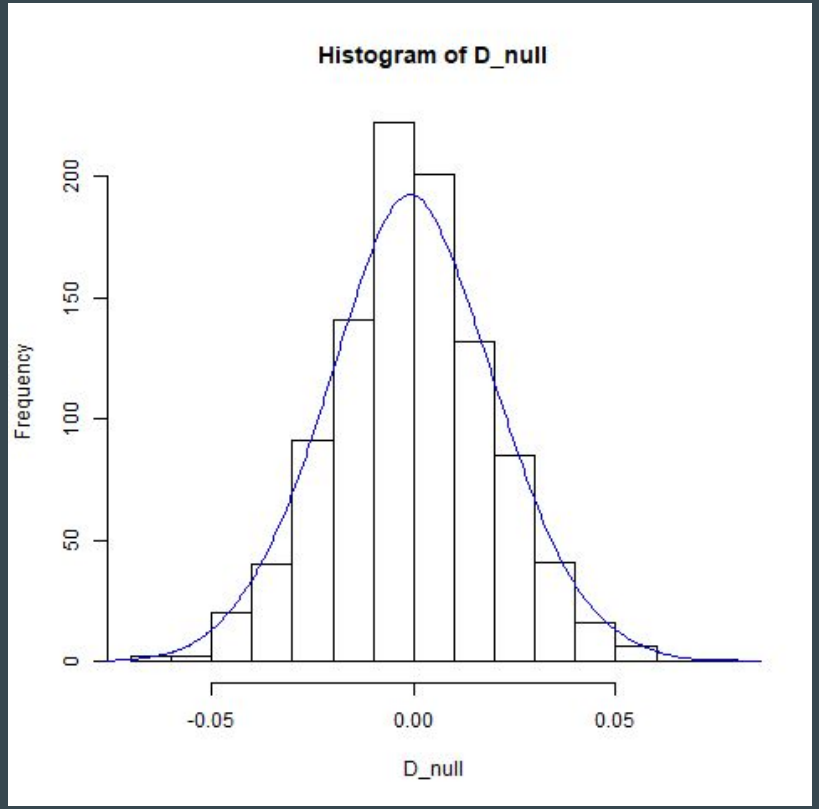


Beer - Potato Chips & New Brunswick

- Let's edit our previous subset and take out the parameter wine and see if there is trend that we can find that allows us to reject the null hypothesis.
- The blue bar would be a subset of:
  - Location = New Brunswick
  - Snacks = Potato Chips
- **Alternate Hypothesis**: People that buy Lager are more frequent buyers of potato chips in New Brunswick than other types of beers.
- **Null hypothesis**: There is no difference in the amount of potato chips bought in New Brunswick along with lager compared to other beers.

- Running a permutation test on this gives us a value of 0.
- The Bonferroni correction would be 0.05 / 157(Total number of bar graphs). 0 is lesser than the required threshold. Hence, we **reject** the null hypothesis.

Permutation Test Result



Business Value

- Identifying items that sell together is very crucial for a company. It allows them to take actions that will help increase their sales and revenue and beat their competitors.
- A possible action they can take is running discounts on the ‘items’ bundle which will attract existing and new customers since customers prefer buying items they need in a bundle at a ‘discounted’ price.
- Another possible action when things sell together is placing them on two opposite ends on the market. This will make customers travel through the entire store and force them to look at other products which may catch their attention and increase sales and hence revenue.
- Hence, this could be implemented for:
    - Pretzel and Lager in New Brunswick during weekends.
    - Popcorn and Cola in Princeton.
    - Lager and Crackers in New Brunswick.
    - Potato Chips and Lager in New Brunswick.

Thank you!