# Analysis of Beer and Brewery Dataset

# Introduction

Dataset contains:

- Breweries and beers from all 50 states
- ~550 Breweries
- ~2400 Beers

- Beers and Breweries are in separate files.
- Datasets were merged on Brewery ID

**Goal:** Find something interesting in this data

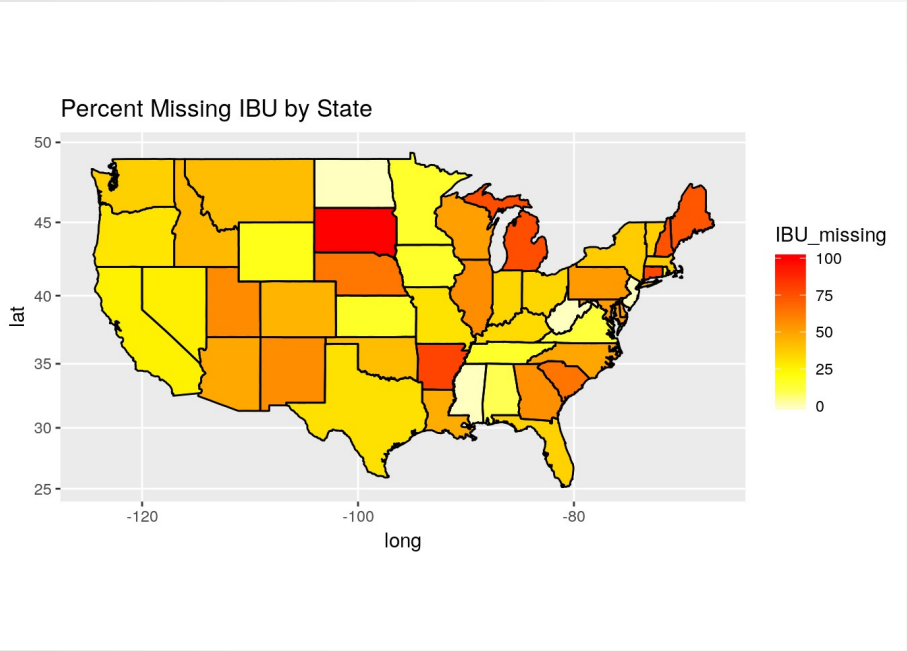
# Null Values in Dataset

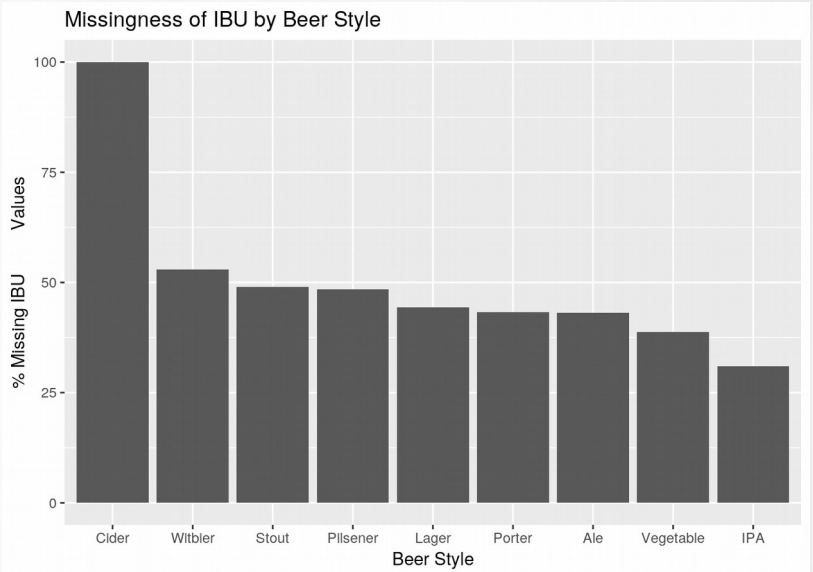
| Column Name | Number of Missing Values | Percent of Values Missing |
|---|---|---|
| IBU | 1005 | 41.70% |
| ABV | 62 | 2.57% |
| Style | 5 | 0.21% |

- A large portion of the IBU values are missing. This is a concern for taking insights from the data.

- The portion of missing data for ABV and Style is relatively small.

# Missing IBU Data

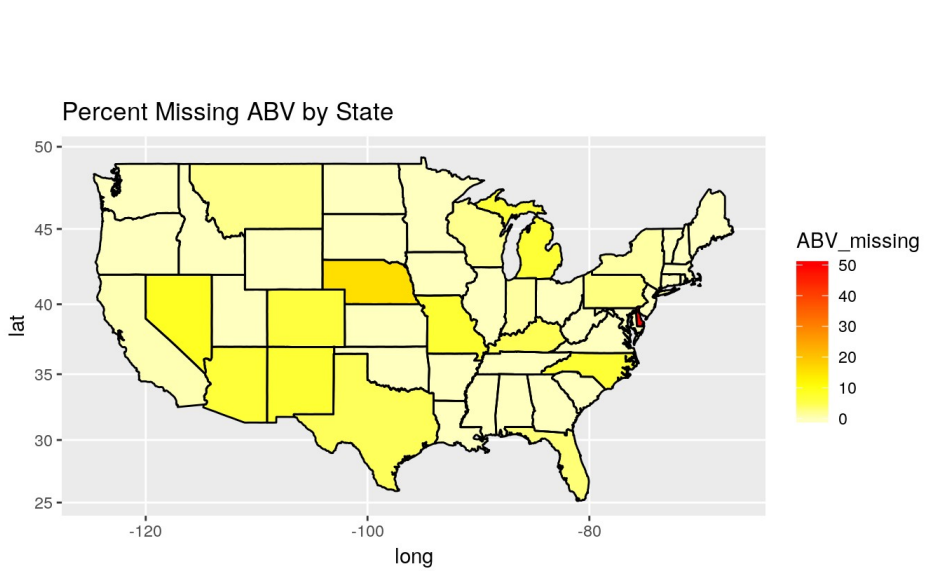



Missing IBU values appear to related to

- States
- Beer Style

# Missing ABV Data

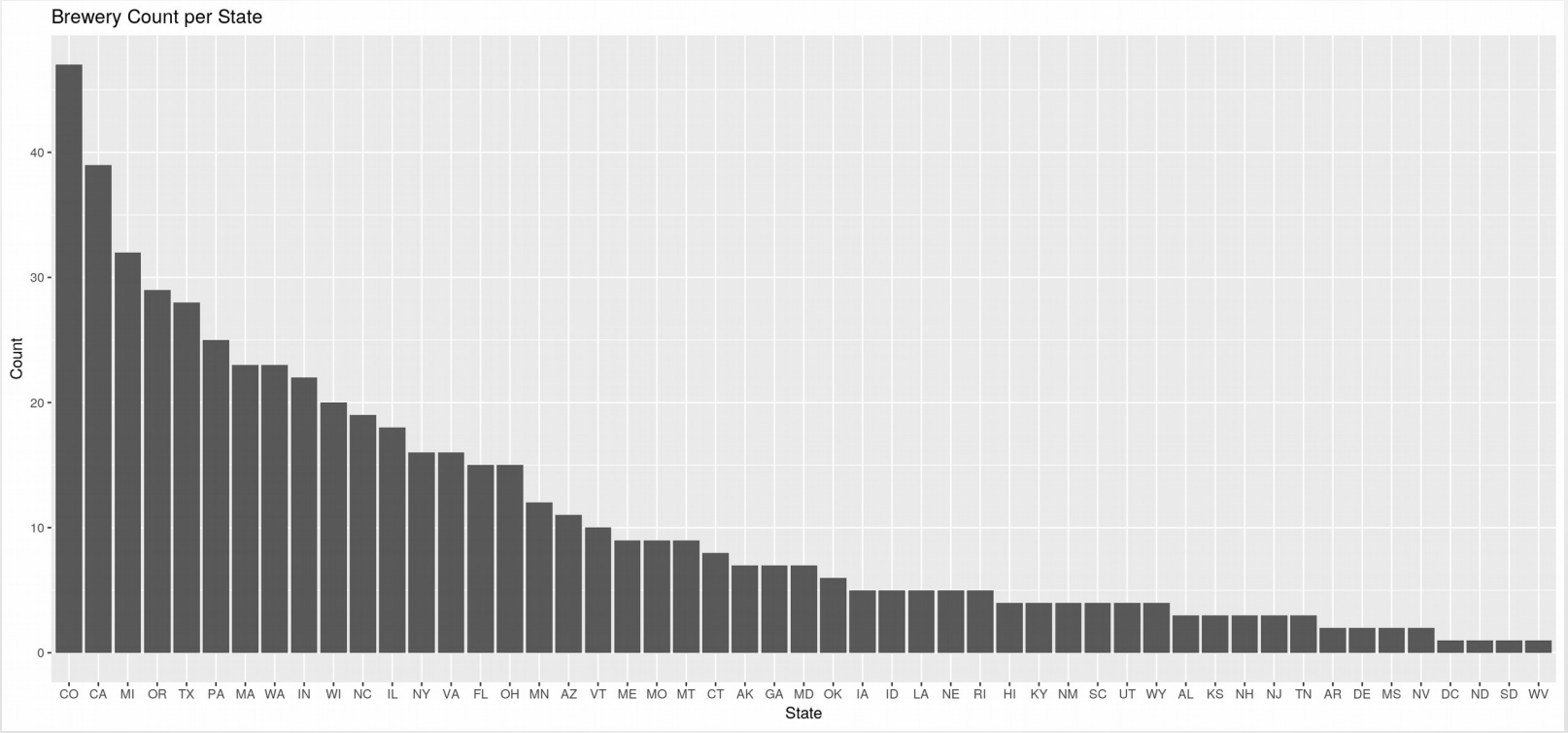



- Generally small variation across states
- Generally low amount missing per state

# Breweries by State

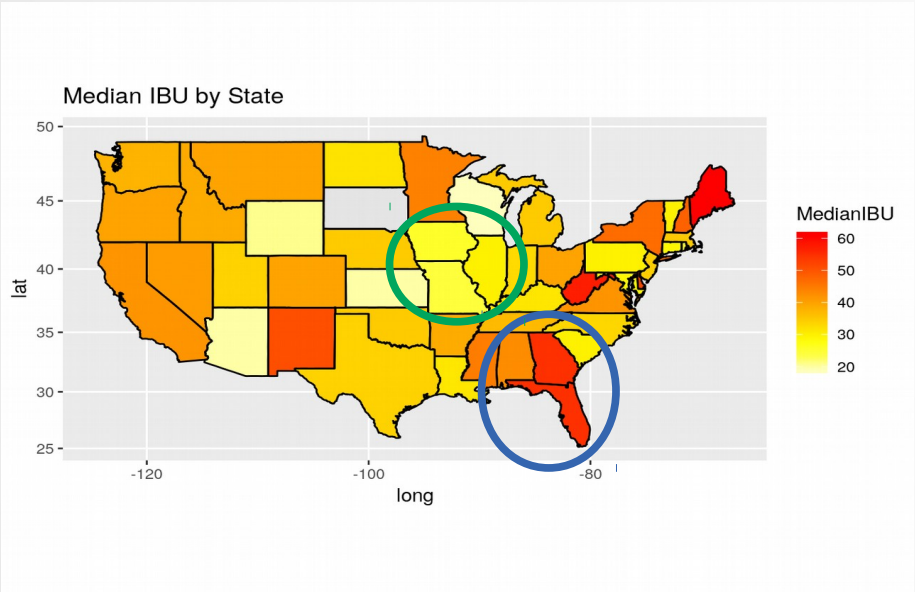
Bulk of the breweries in one-thirds of states.

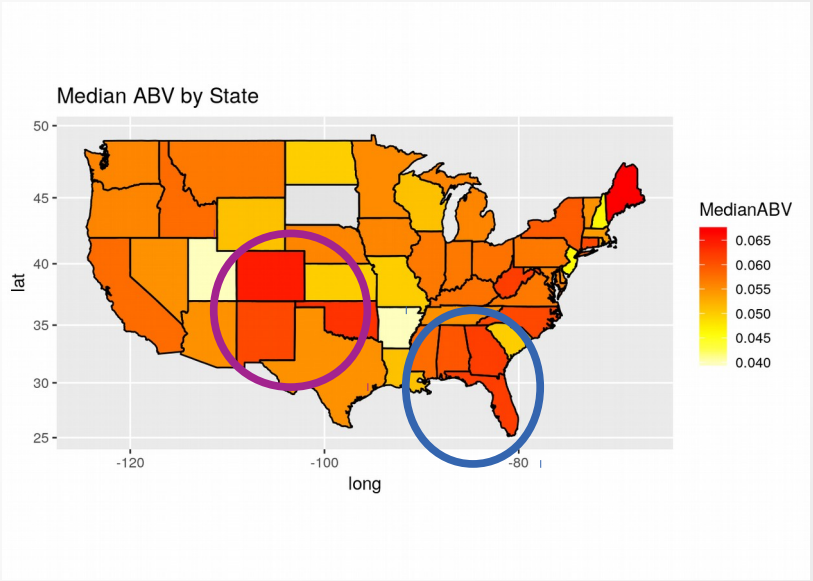
Most breweries are in Colorado.



# Median IBU and ABV by State

Plotting median IBU and ABV by state shows some geographic clustering.




Higher median IBU/ABV in deep south

High ABV in south central states

Low IBU in midwestern states

# Maximum IBU and ABV by State

- The most alcoholic beer is from Kentucky, followed by Indiana.

These two beers have a substantially higher ABV than others.

- The most bitter beer is from Oregon

# Statistics of ABV

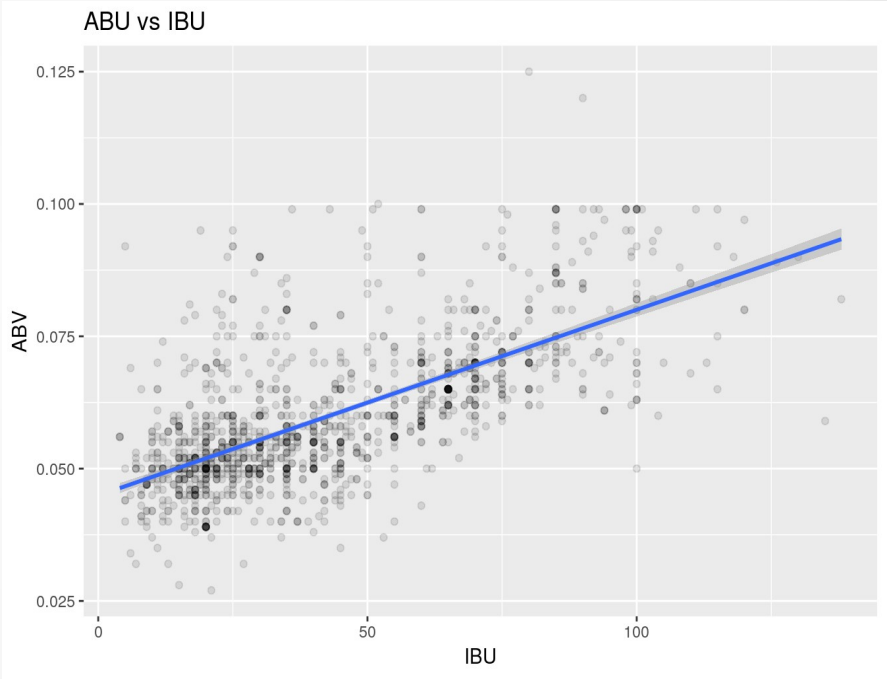
| Statistic | Value |
|---|---|
| Min | 0.1% |
| 1st Quartile | 5% |
| Mean | 5.98% |
| Median | 5.60% |
| 3rd Quartile | 6.7% |
| Max | 12.8% |
| standard deviation | 1.35 percentage points |
| range | 12.7 percentage points |

- Median and mean are not close in value
- The bulk of the data is between 5% and 6.7%

# Relationship of ABV and IBU

- Strong evidence of a linear relationship between IBU and ABV.

- Linear Regression (p-value < 0.0001)



# Conclusion

Insights from the data exploration:

There is evidence that the missing data is not ‘at random’.

There appears to be a geographic clustering of median IBU and median ABV of beers.

Most beers have a moderate ABV (5% - 6.7%).

There appears to be a linear relationship between IBU and ABV.