

Brewing Chemistry

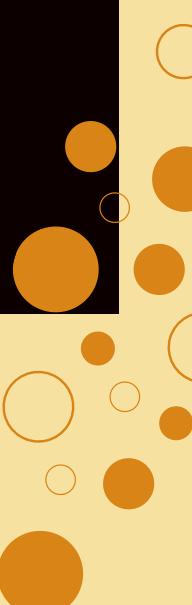
Capstone Project by Erin Wasserman

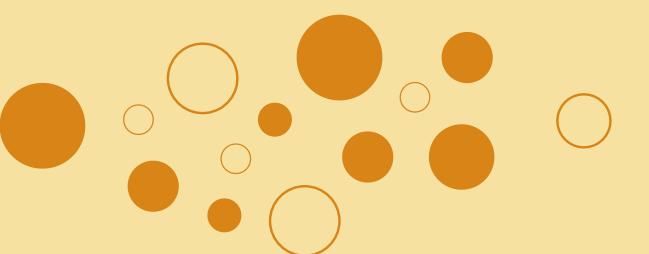




Business Problems

- 1. Determine best malt and hops types for quality beer.**
- 2. Assess malt-to-hops ratio impact on beer quality.**
- 3. Evaluate ML accuracy in predicting beer characteristics.**
- 4. Visualize beer styles based on quality ratings.**





Data Understanding



Source: Kaggle (open commons)



Over 10 million records



20 different features





Methodology



**Unsupervised
modeling**

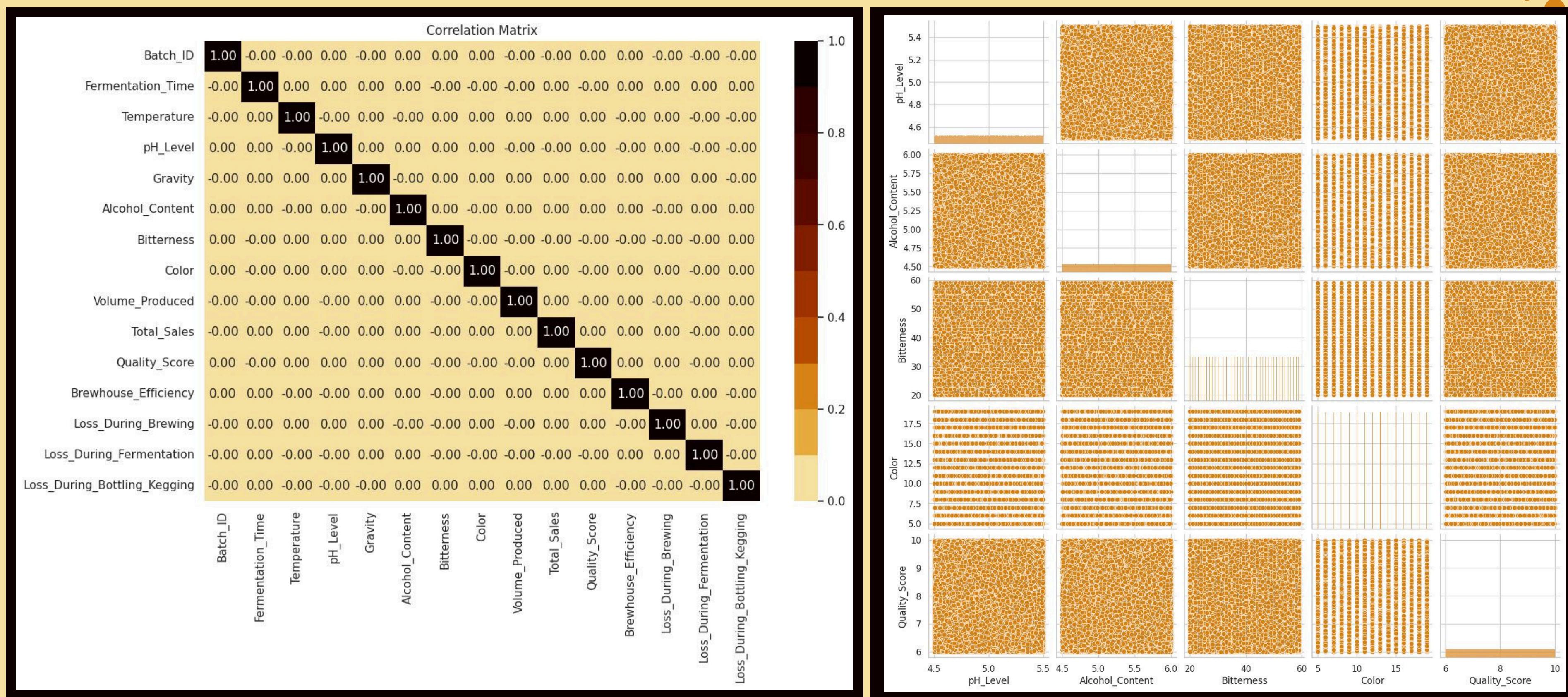


**Derived Chemical
Property Analysis**



**Supervised
modeling**

Results



Correlation Matrix



10 million data points

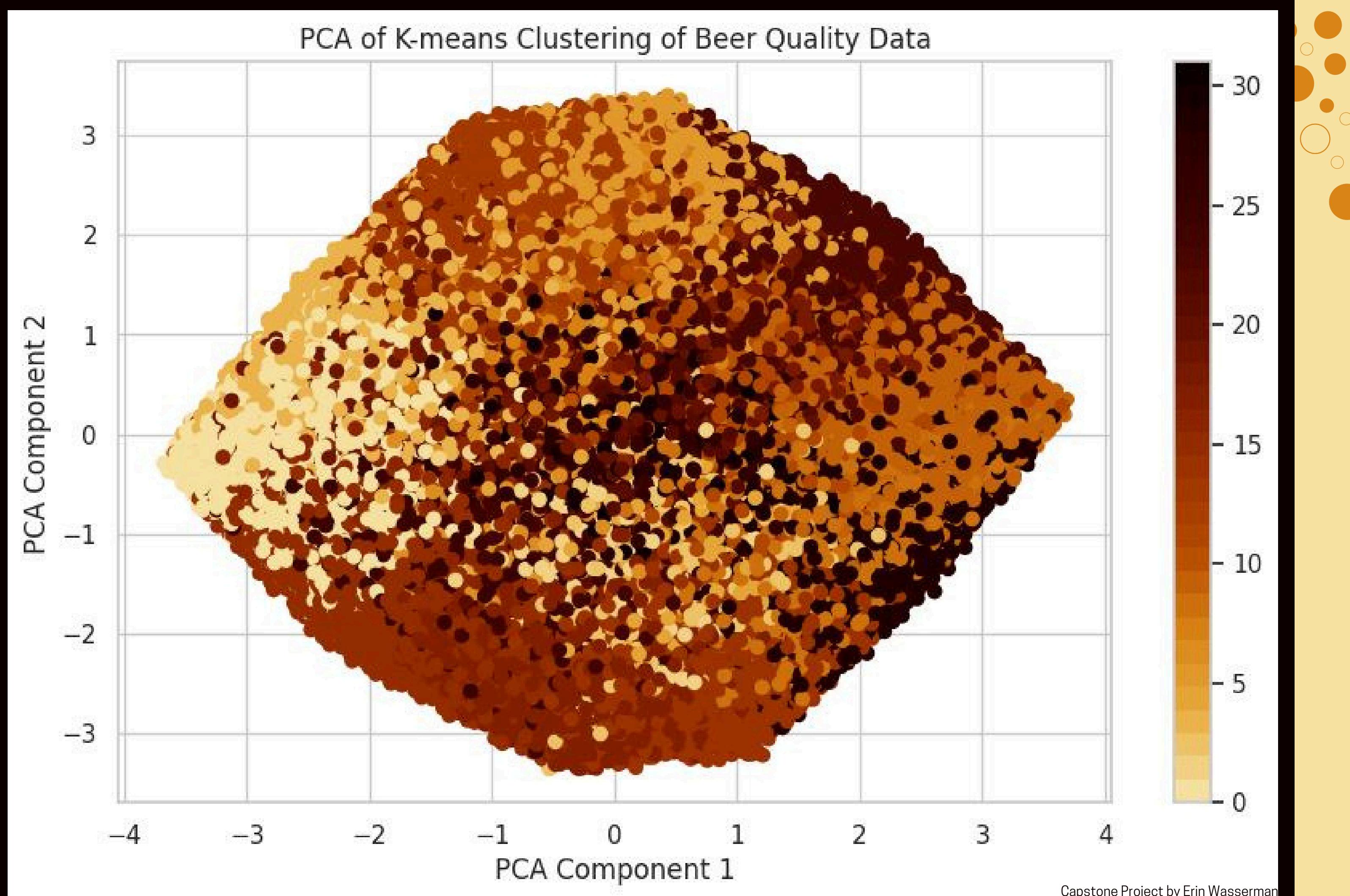


Pair Plot

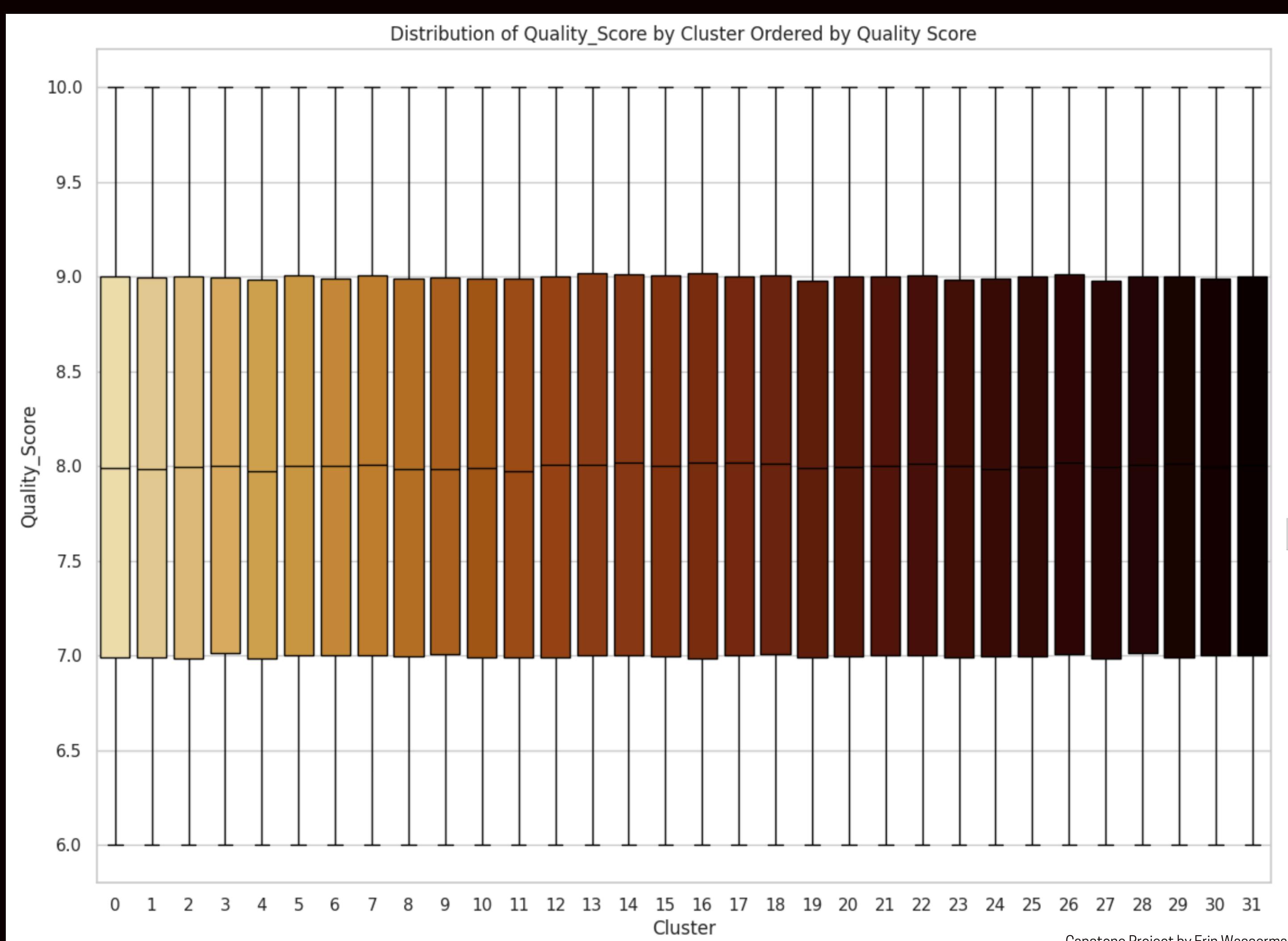


10 million data points

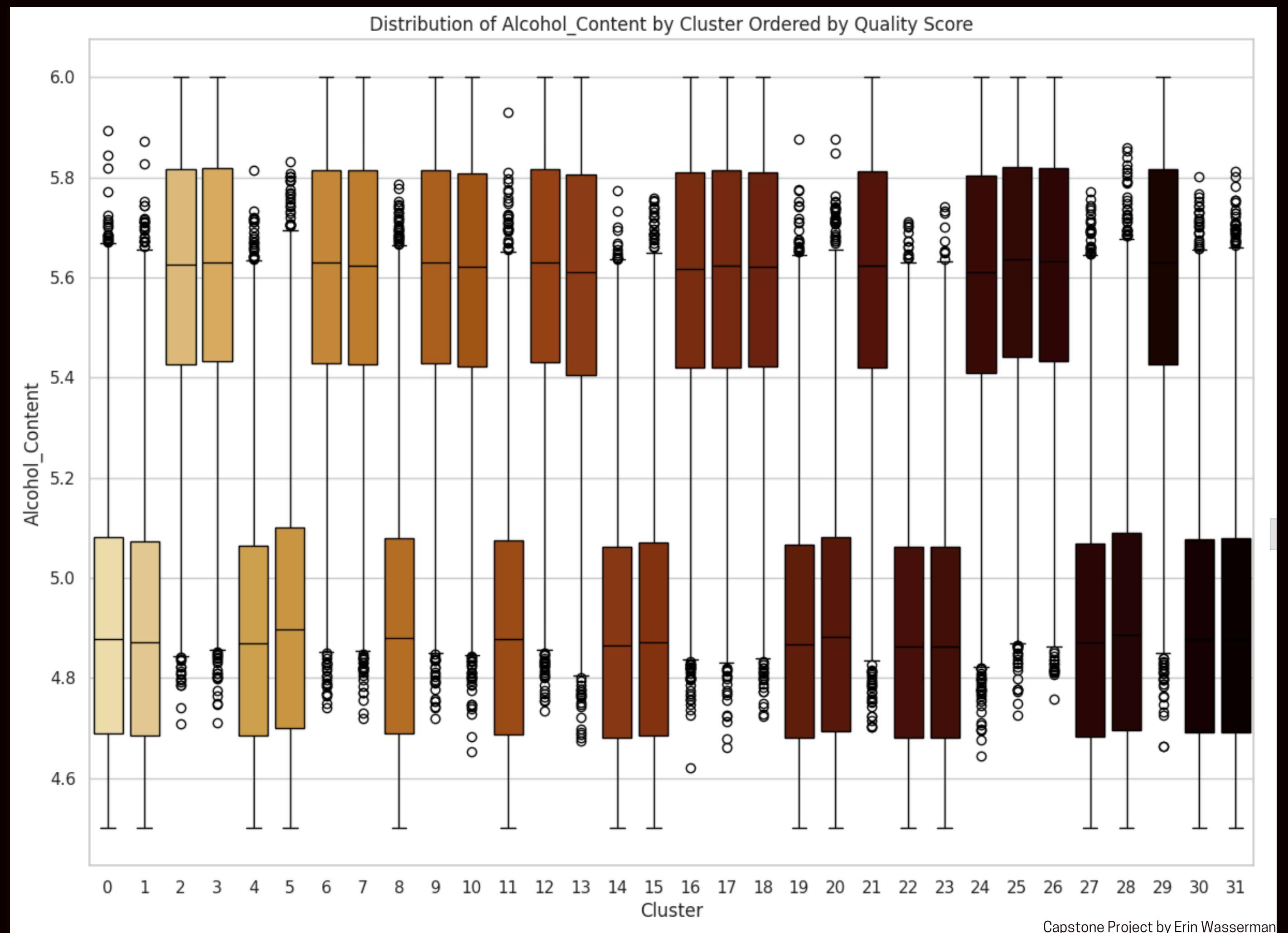
Results



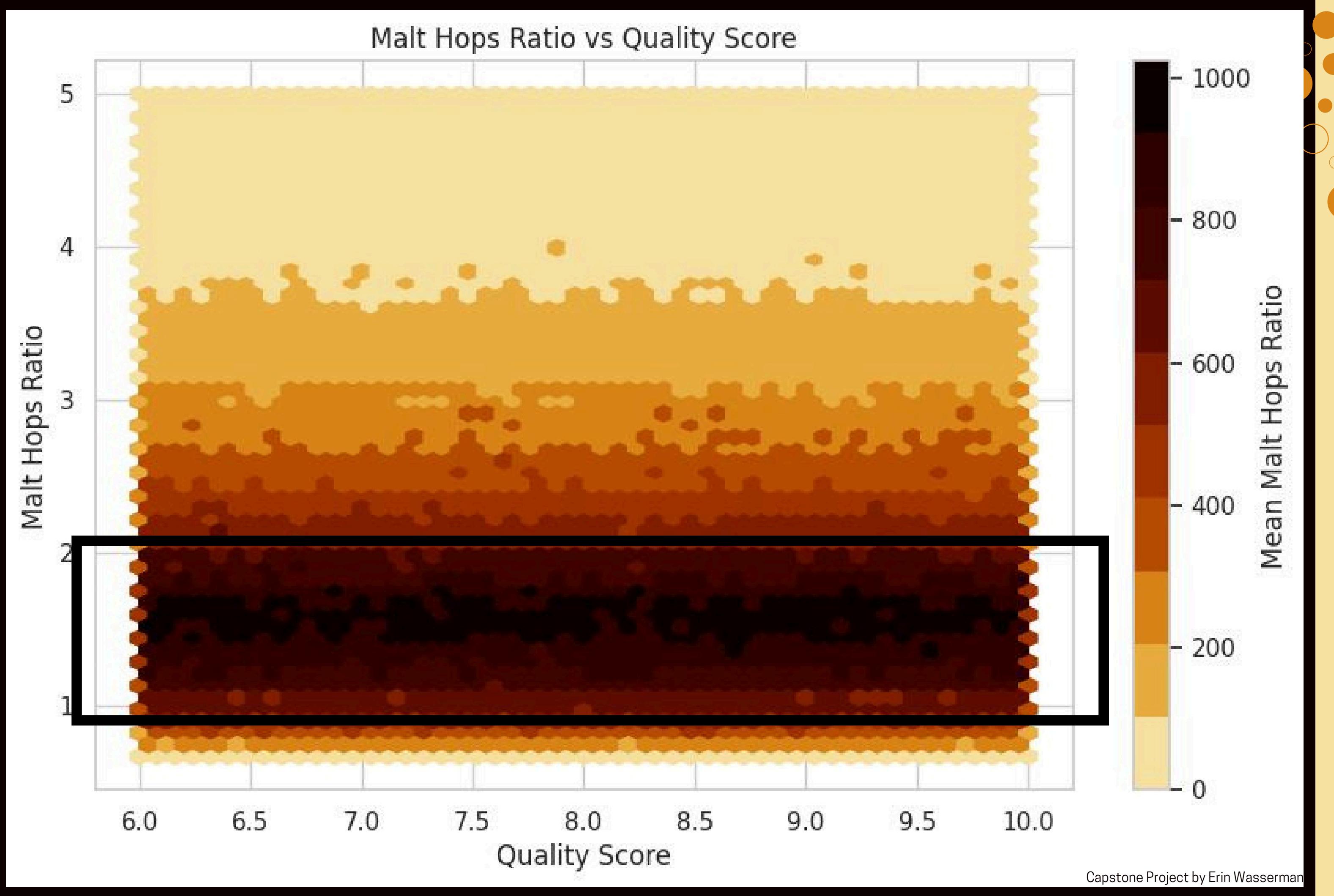
Results



Results



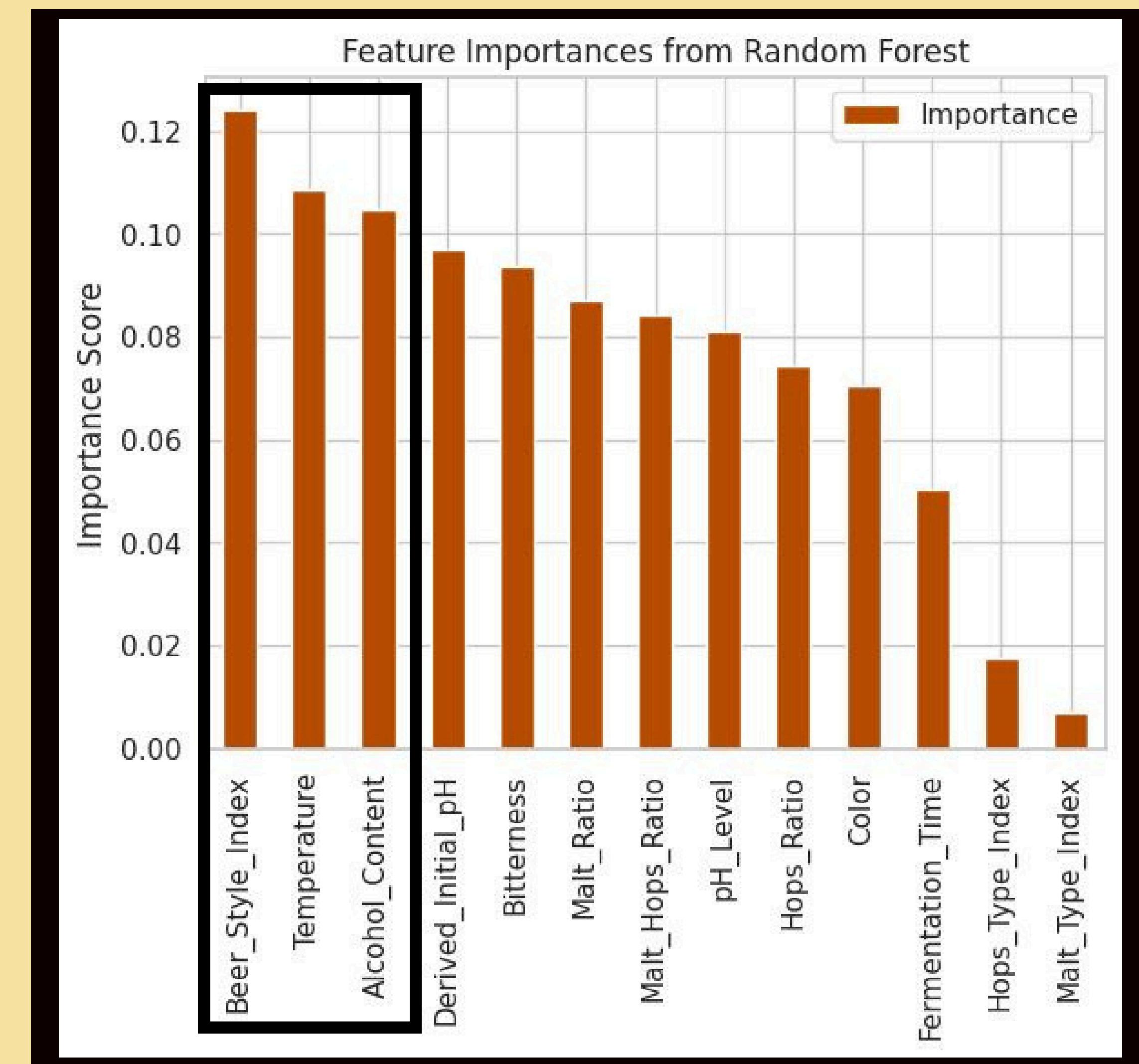
Results



Results



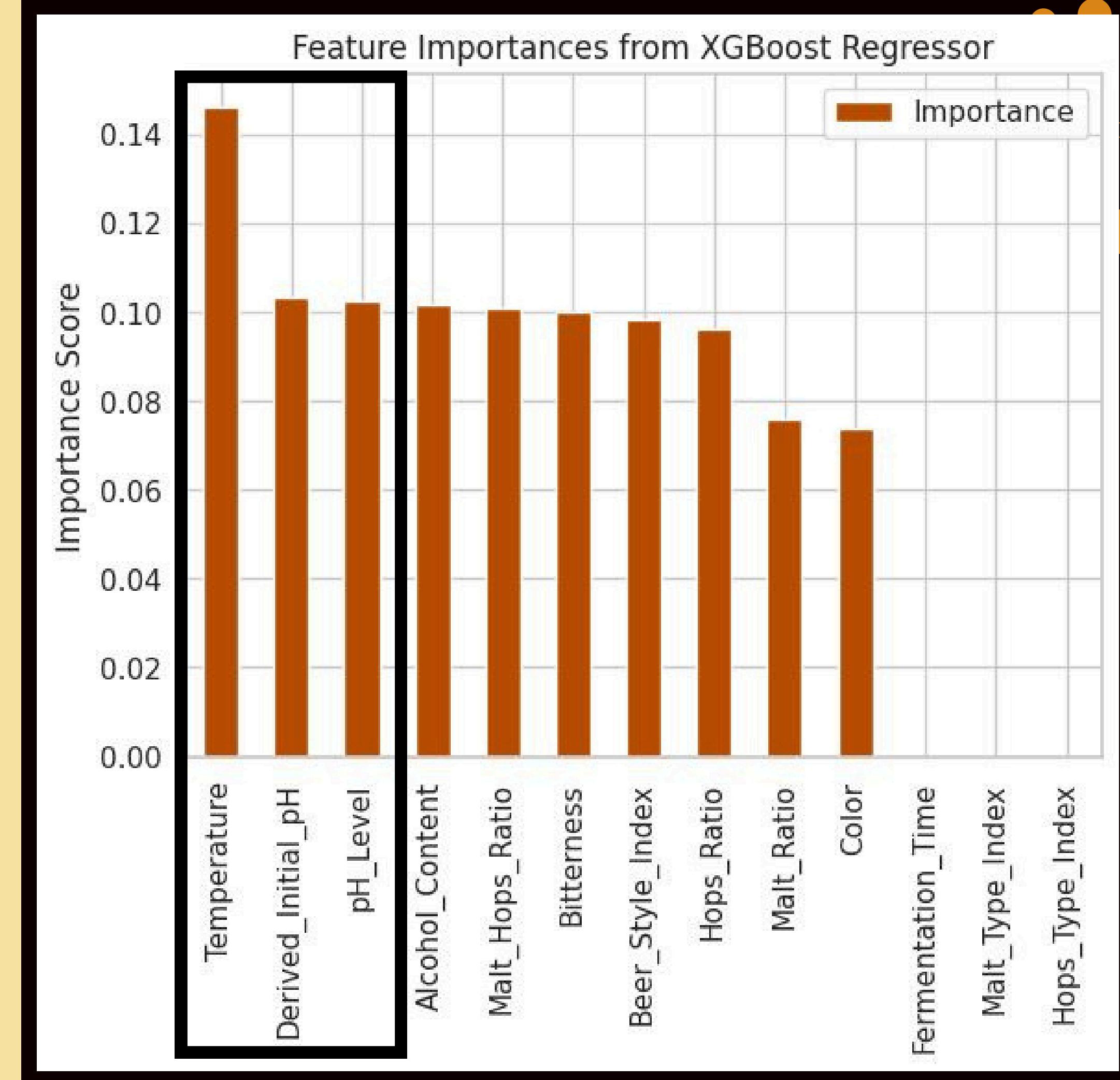
R² Score=



Results



R² Score =



Recommendations



Refine Malt-to-Hops Ratios



Validate Machine Learning Models



Leverage Clustering for Beer Style Differentiation



Analyze Malt and Hops Types Combinations



Limitations



Computational Bottlenecks



Underutilization of Data

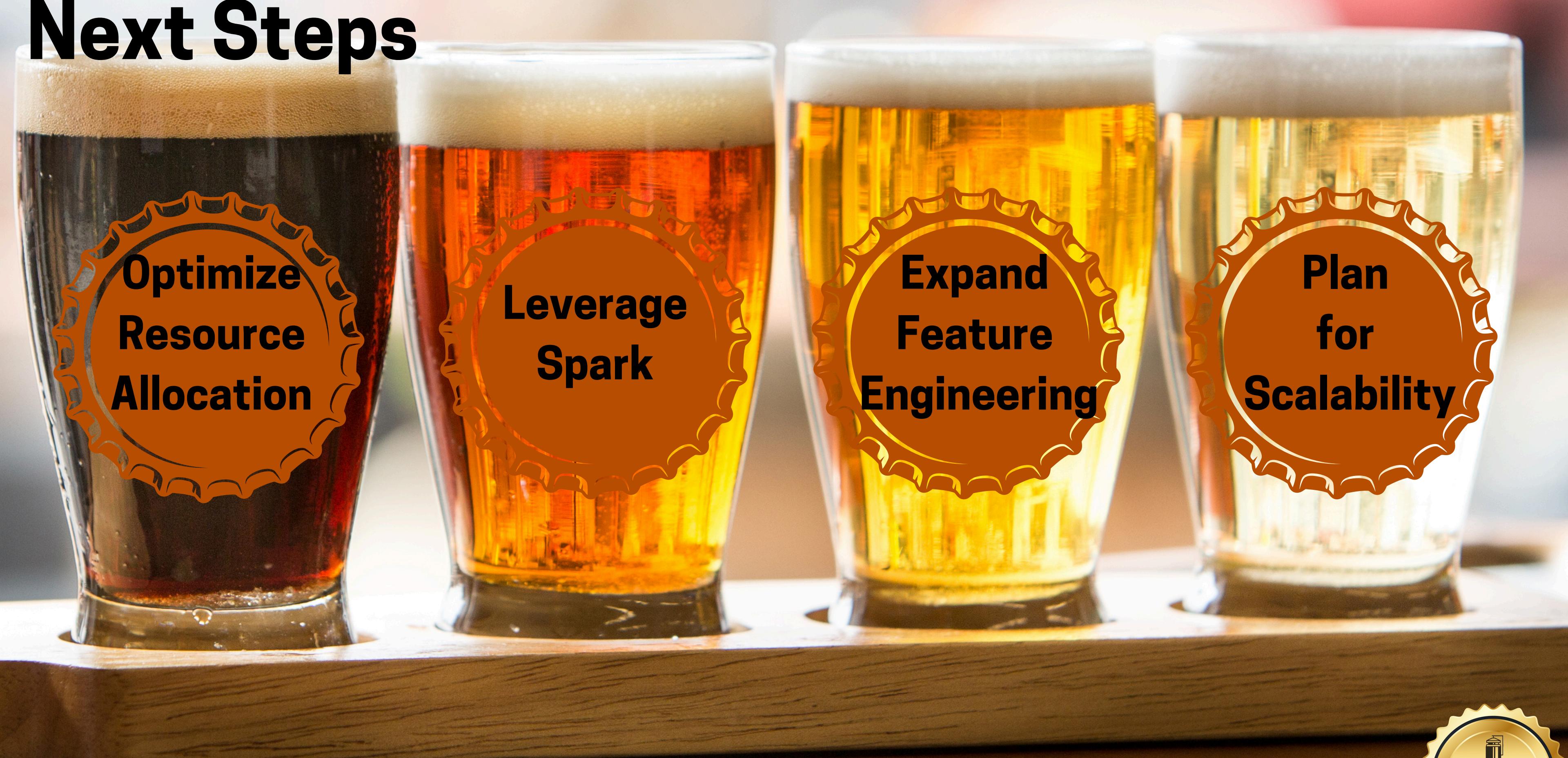


Sampling Bias



Reduced Feature Engineering

Next Steps



Optimize
Resource
Allocation

Leverage
Spark

Expand
Feature
Engineering

Plan
for
Scalability





Thank you



Question and Answer

