Project 1
Wine Quality

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Agenda

Data Set & Objective

Process

Red Wine vs White Wine

High/Low Quality Red Wines

High/Low Quality White Wines

Summary

Limitations




Objective

- The data set provided allowed us to analyze red & white wine attributes by a high- and low-quality scoring scale. We will review the attributes that make up the best (high score) and worst (low score) quality wines. From a business perspective we are looking for high-quality wines attributes for wine makers to replicate and not replicate low-quality wines.

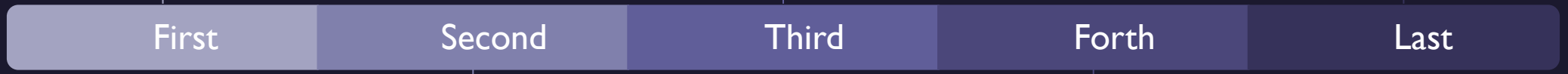
Data Set: https://archive.ics.uci.edu/ml/datasets/Wine+Quality

Process

We reviewed a few different datasets to figure out which would be a good fit for the group. Downloaded wine data from University of California, Irvine.

Divided wine quality data between the group [red/white; high(9)/low(3)] and established a series of standard functions and graphs to for each data split.

Lastly, we created this presentation to display our work. Happy Viewing!



Toggled between coming up with our story and running functions to match or running functions to have the data tell us the story. Combination of Both.

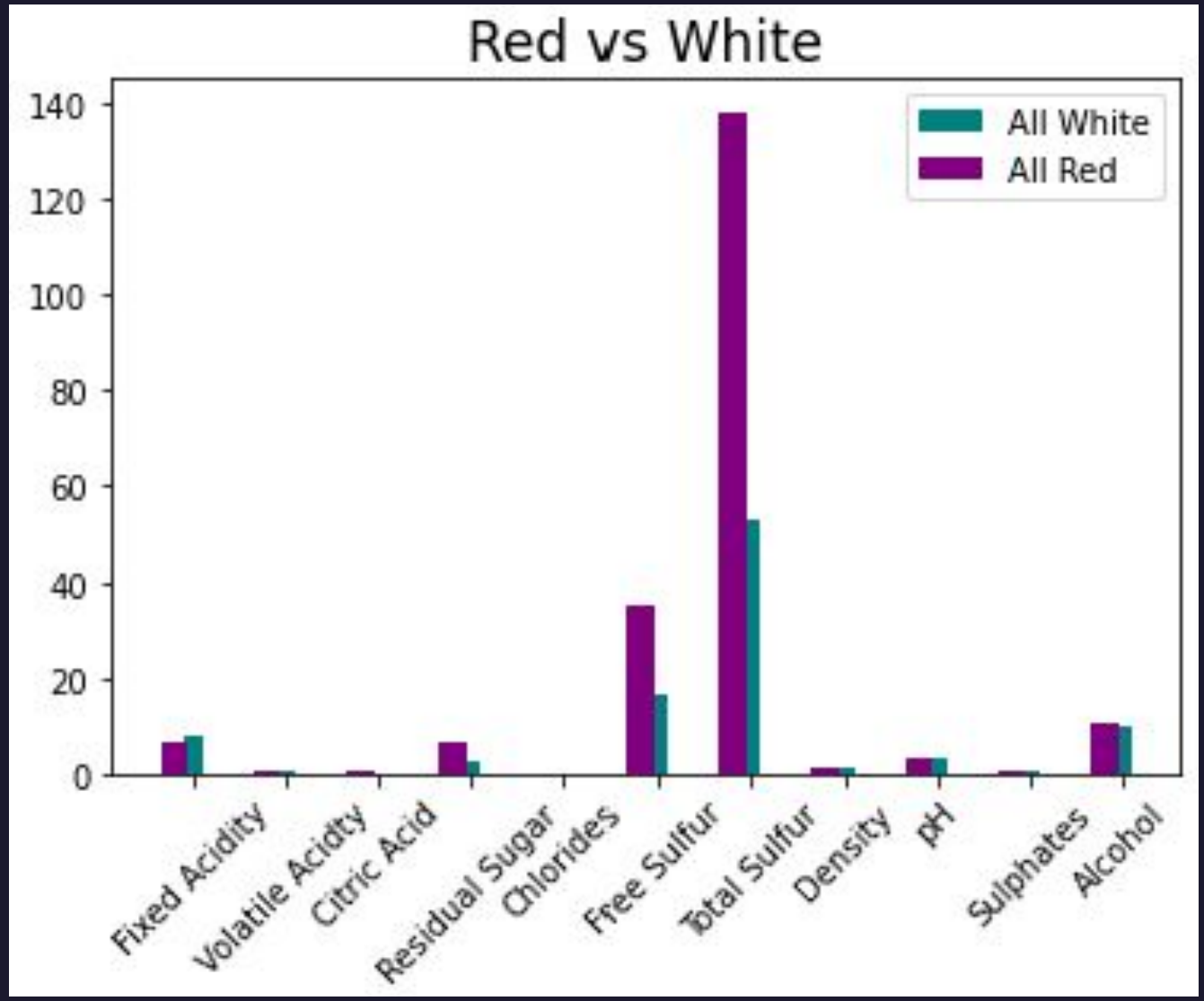
We joined each data set to compare their average attributes. We analyzed the similarities to be able to replicate a quality wine.

All Wine

All Red Wines vs All White Wines

Variances

- Total Sulfur (78% Spread)
- Free Sulfur (17% Spread)
- Residual Sugar (5% Spread)
- Fixed Acidity (2% Spread)



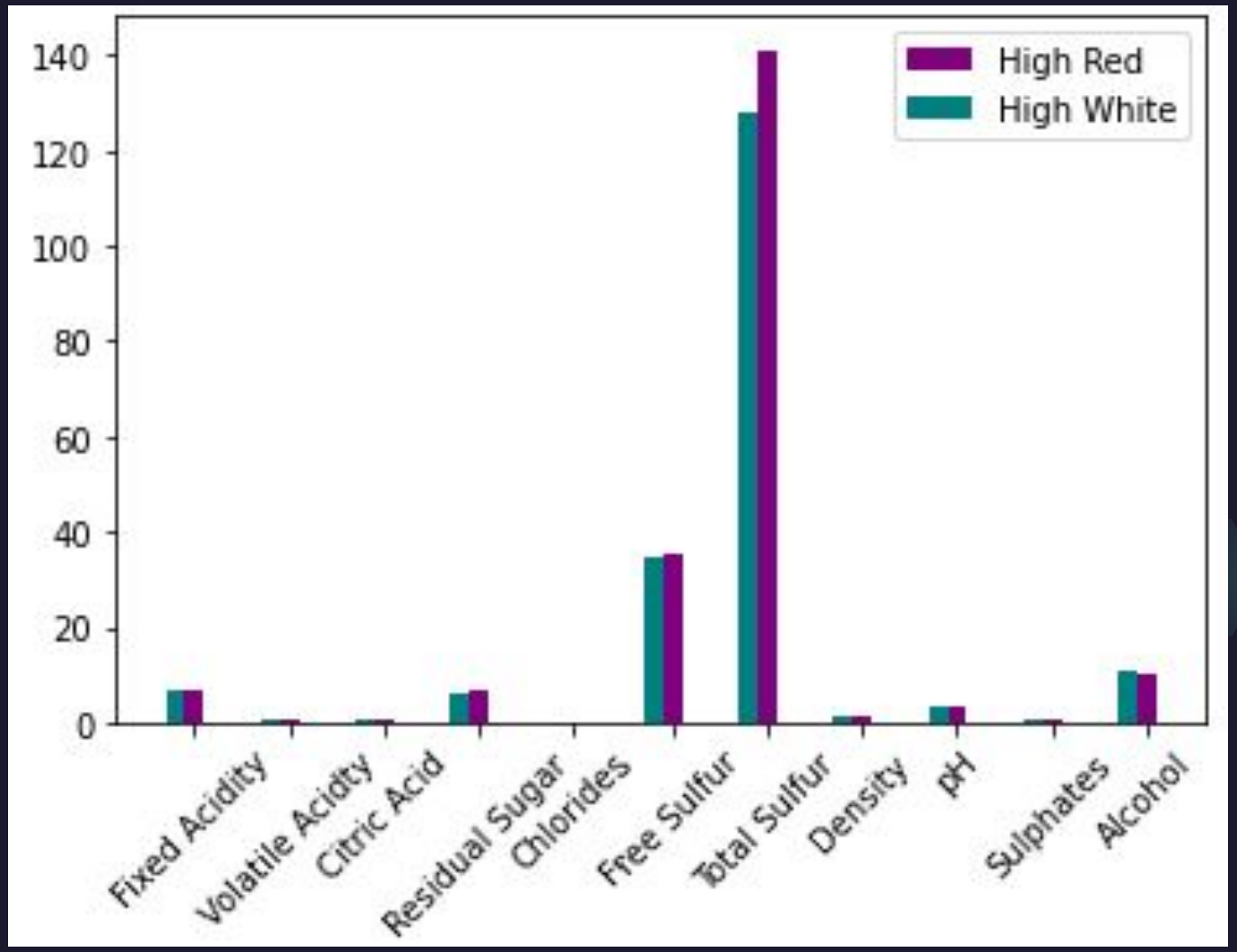
High Red Wines vs High White Wines

Similarities

- Fixed Acidity
- Free Sulfur
- Density
- pH
- Sulphates
- Volatile Acid
- Citric Acid

Variance

- Total Sulfur
- Residual Sugar
- Alcohol



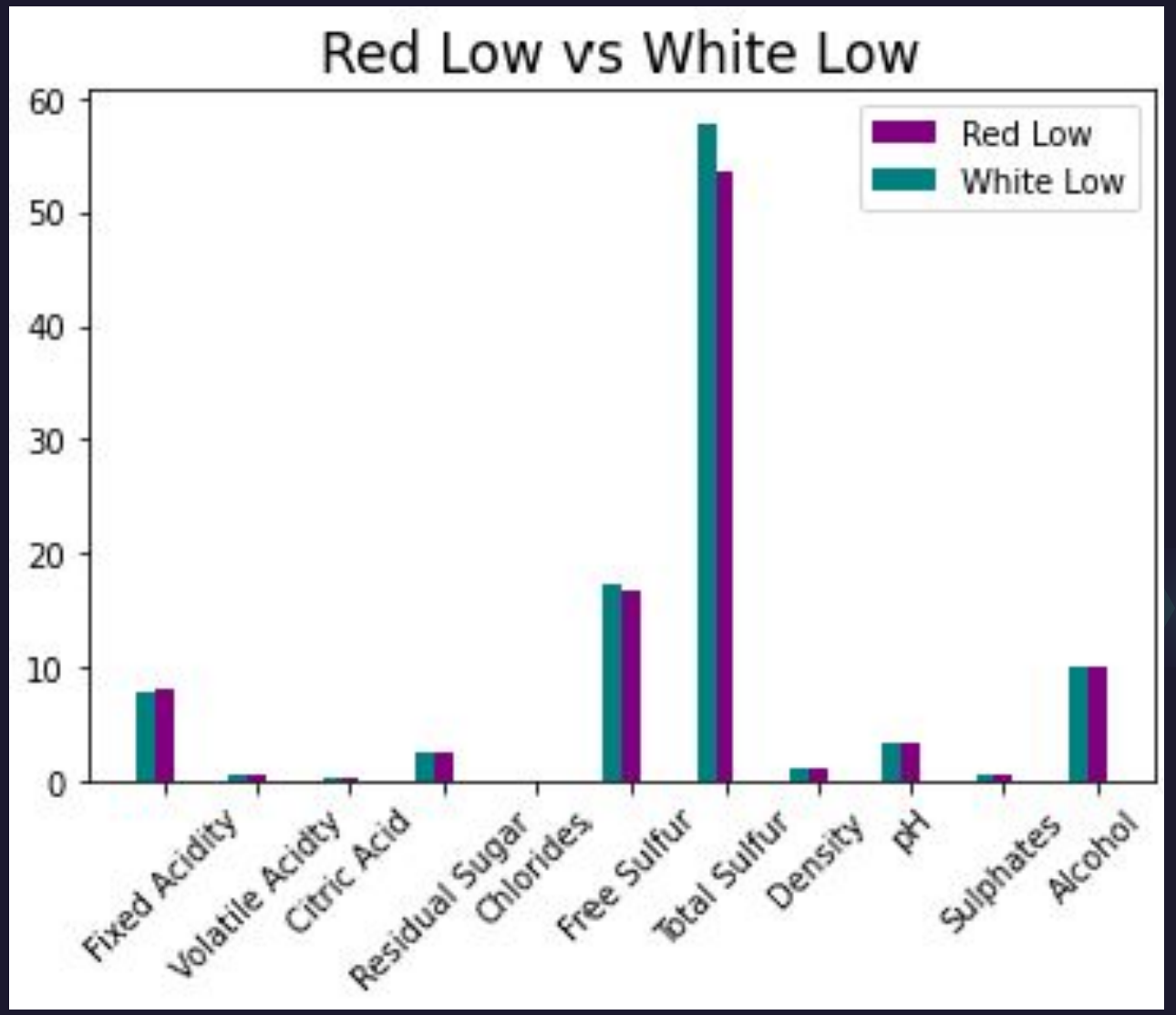
Low Red Wines vs Low White Wines

Similarities

- Fixed Acidity
- Density
- pH
- Sulphates
- Density
- Volatile Acid
- Citric Acid

Variance

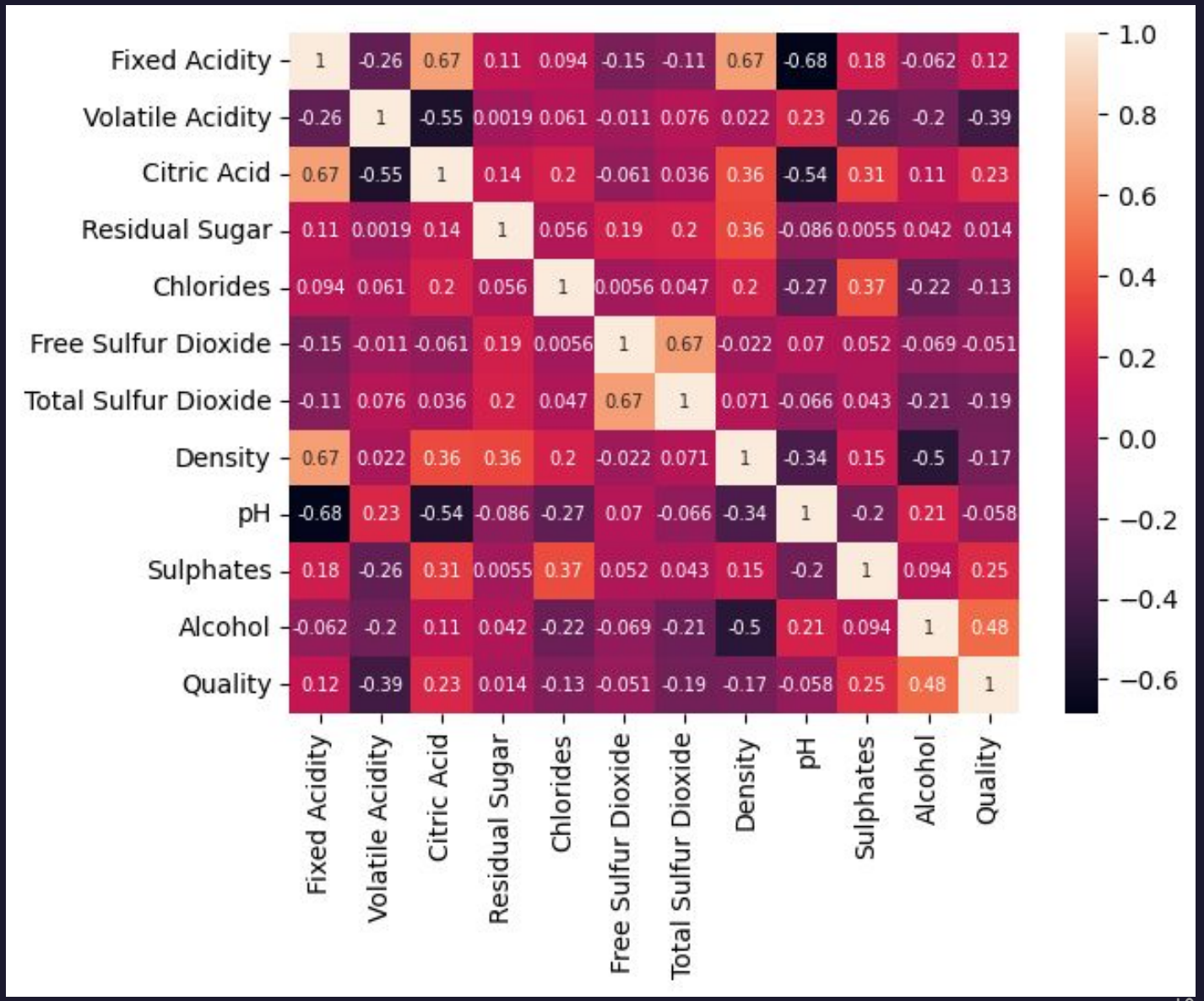
- Total Sulfur
- Free Sulfur



Red Wine

Red Wine Heatmap

- Negative Correlation (Closer to -1)
  - Fixed Acidity and pH
    - -0.68
  - Citric Acid and pH
    - -0.54
  - Citric Acid and Volatile Acidity
    - -0.55
- Positive Correlation (Closer to +1)
  - Density and Fixed Acidity
    - 0.67
  - Citric Acid and Fixed Acidity
    - 0.67
  - Total Sulfur Dioxide and Free Sulfur Dioxide
    - 0.67

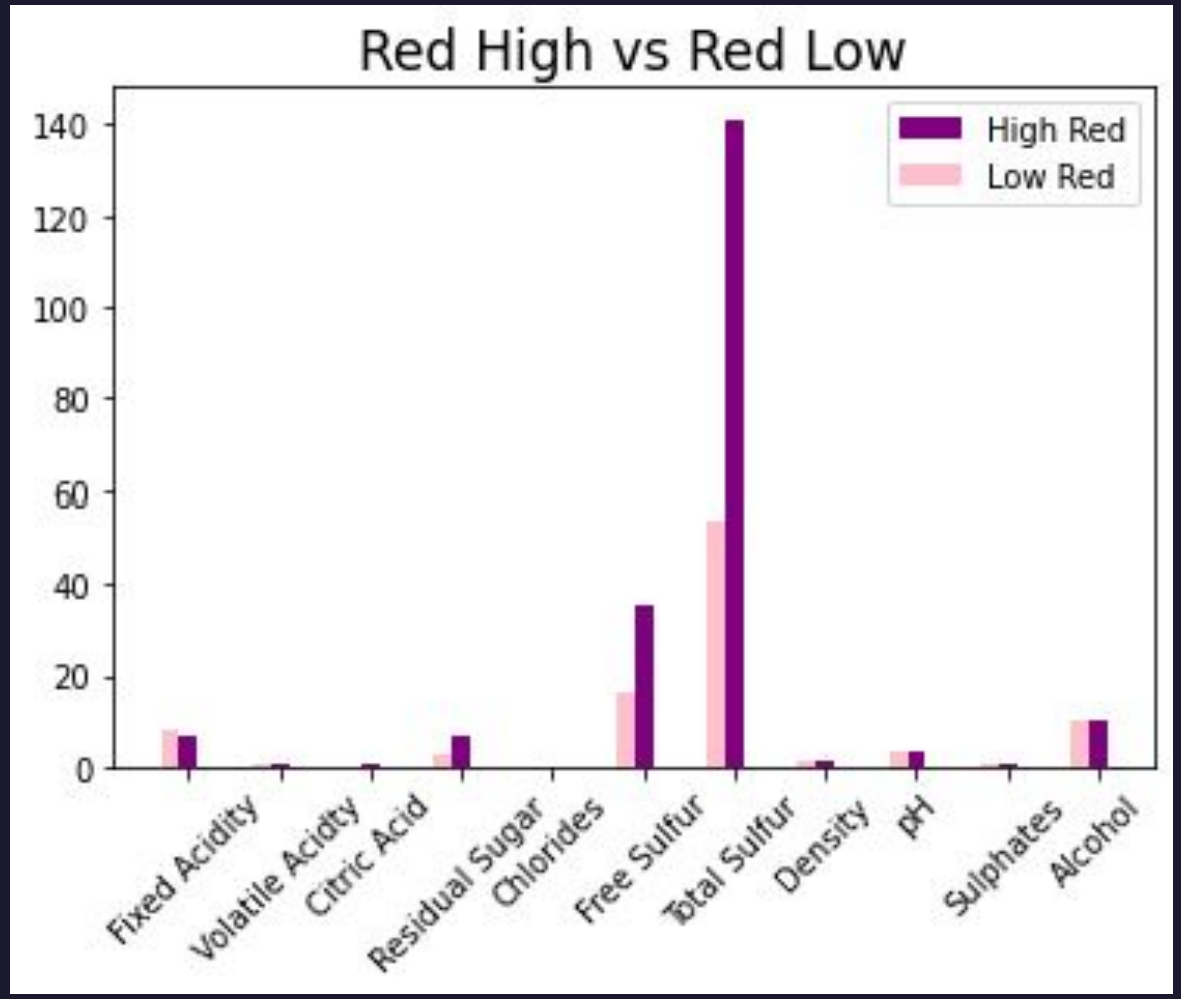


High-Quality VS Low-Quality Red Wines

ATTRIBUTE VARIANCE OF RED WINE

- Free Sulfur
- Total Sulfur
- Residual Sugar
- Fixed Acidity

- Comparison between high and low red wine:
  - More sulfur present for high quality
  - More residual sugar for high quality
  - Alcohol and pH is equal



White Wine

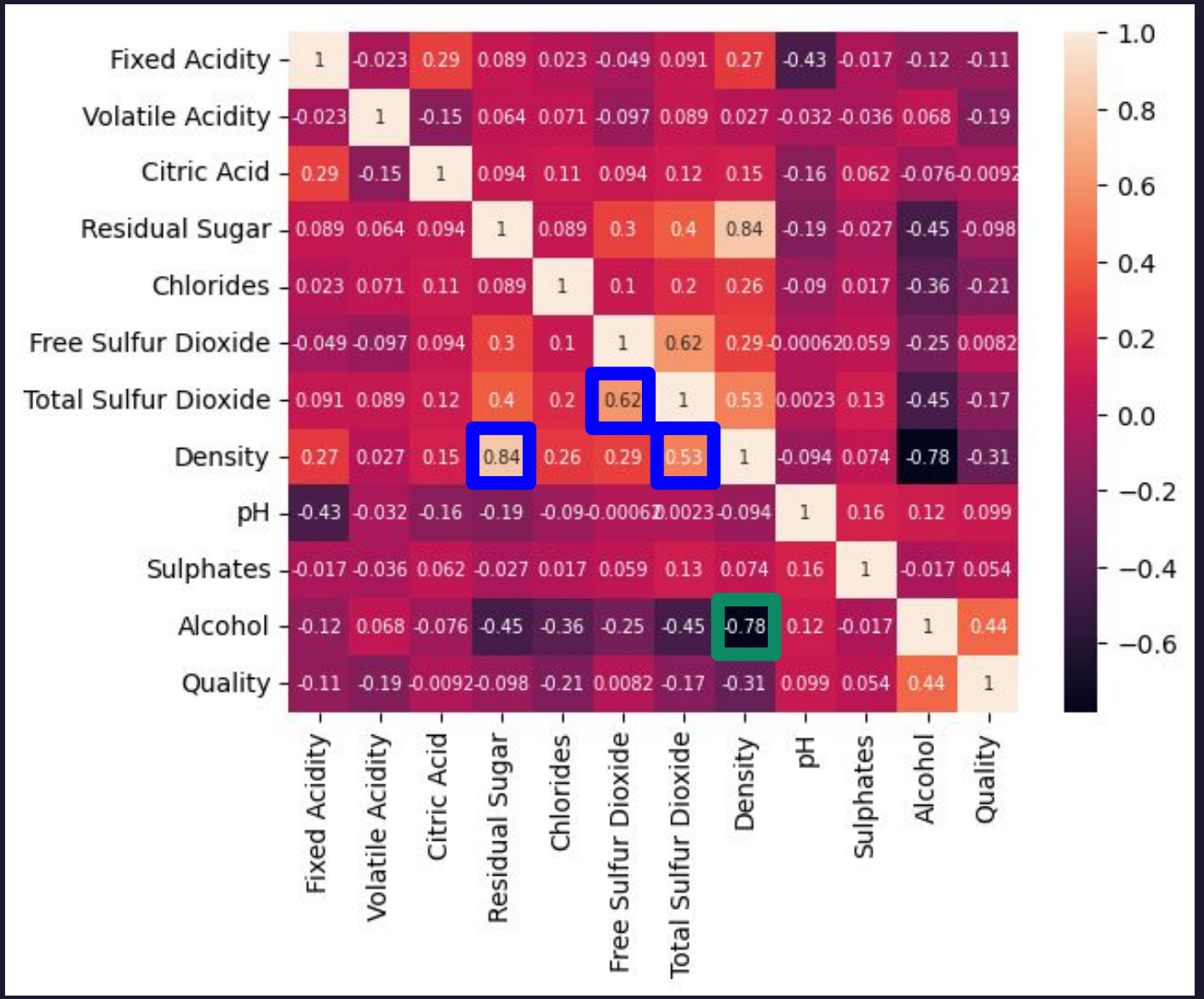
White Wine Heatmap

- **Negative Correlation (Closer to -1)**
  - Density & Alcohol
    (-0.78)

- **Positive Correlation (Closer to +1)**
  - Density & Residual Sugar
    (0.84)

  - Total Sulfur Dioxide & Free Sulfur Dioxide
    (0.62)

  - Density & Total Sulfur Dioxide
    (0.53)



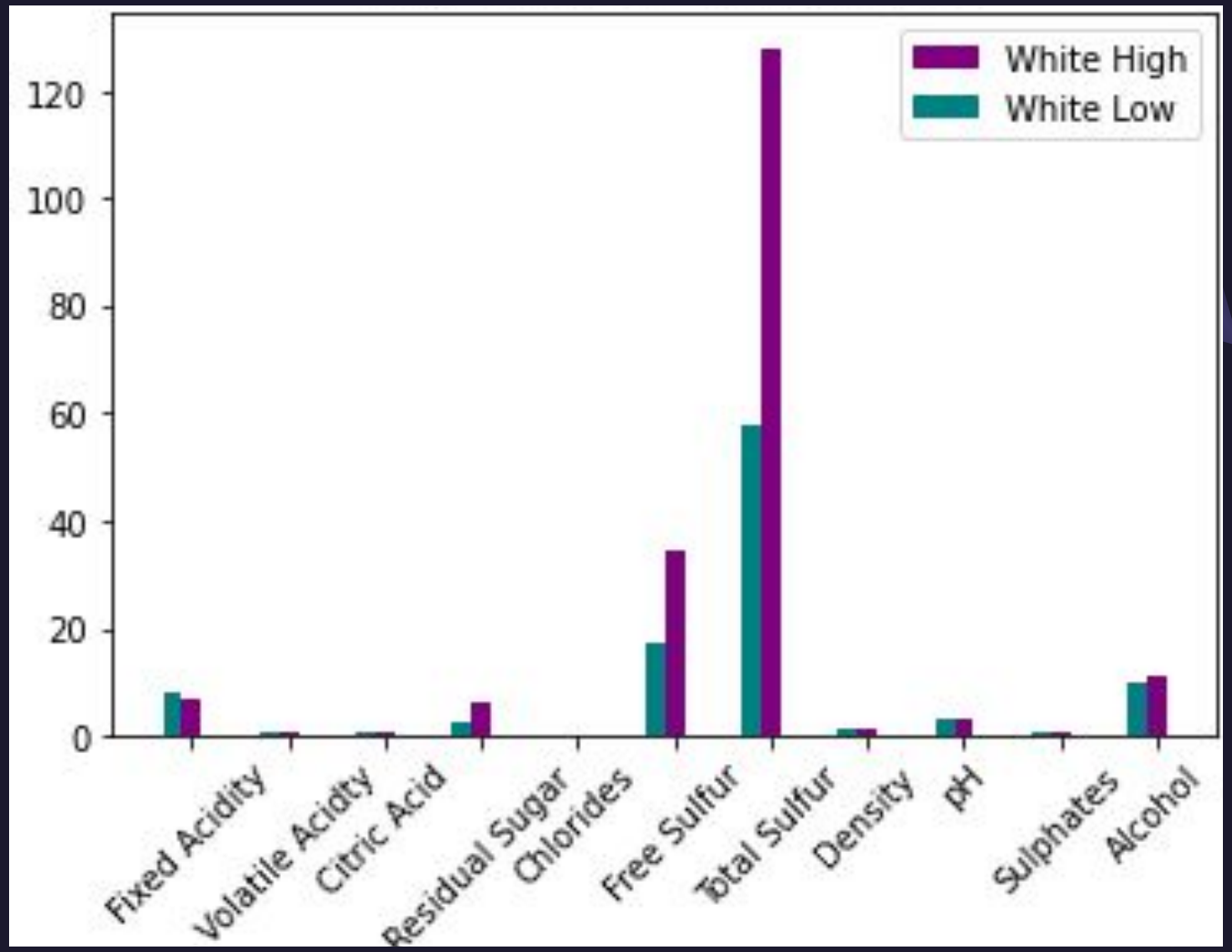
High-Quality VS Low-Quality White Wines

Similarities

- **Volatile acidity**
- **Citric Acid**
- **Density**
- **pH**
- **Sulphates**

Difference

- **High quality has more sulfur dioxide**
- **High quality has more residual sugar**
- **High quality has less fixed acidity**
- **High quality has slightly more alcohol**



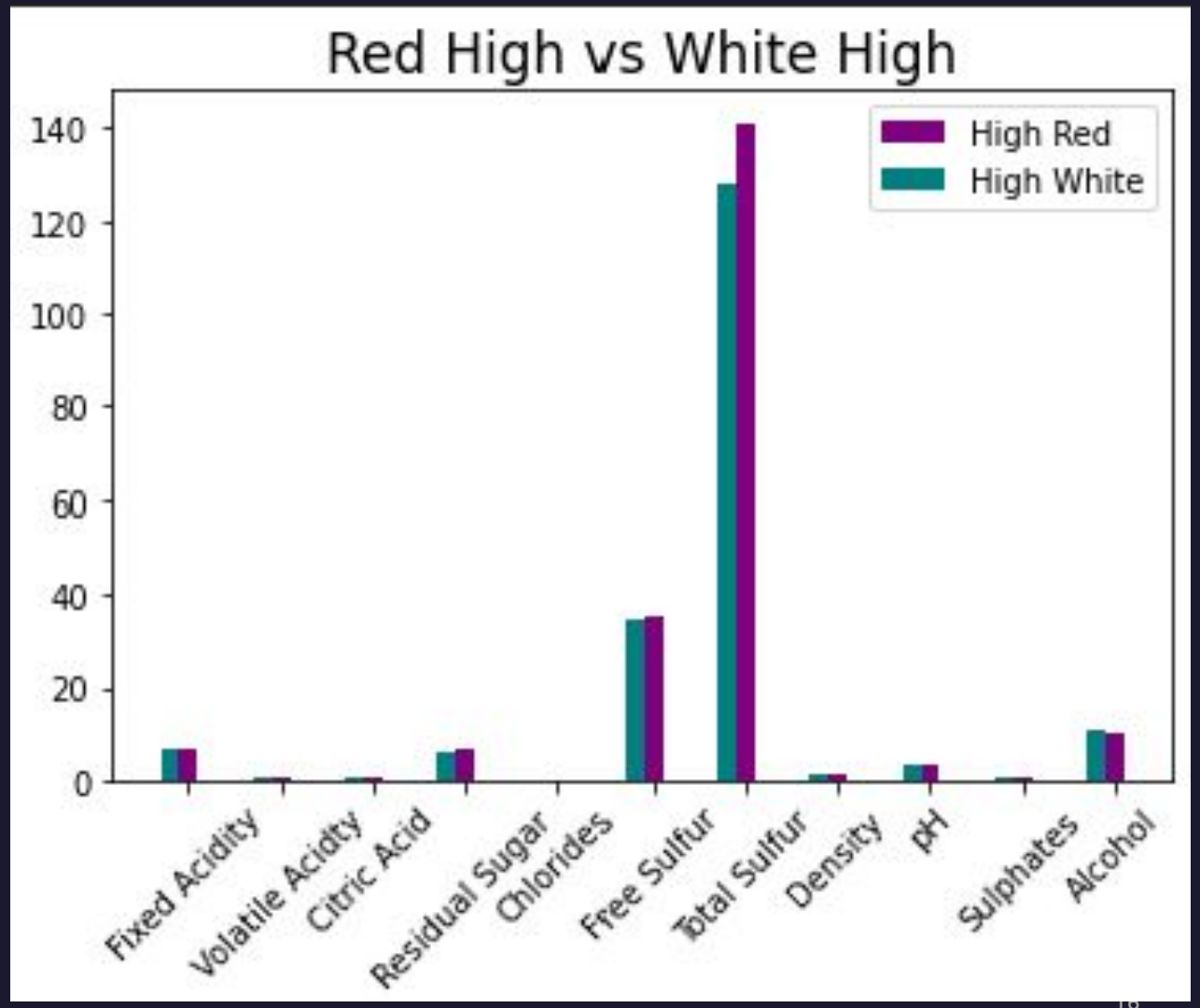
Summary

After comparing 4,898 data points both high-quality and low-quality wines carry attributes that fall into a similar ranges to reproduce. High-quality wines carry higher overall attribute averages for both red and white wines.

High-Quality Red & High-Quality White Wines

ATTRIBUTES OF HIGH-QUALITY WINE

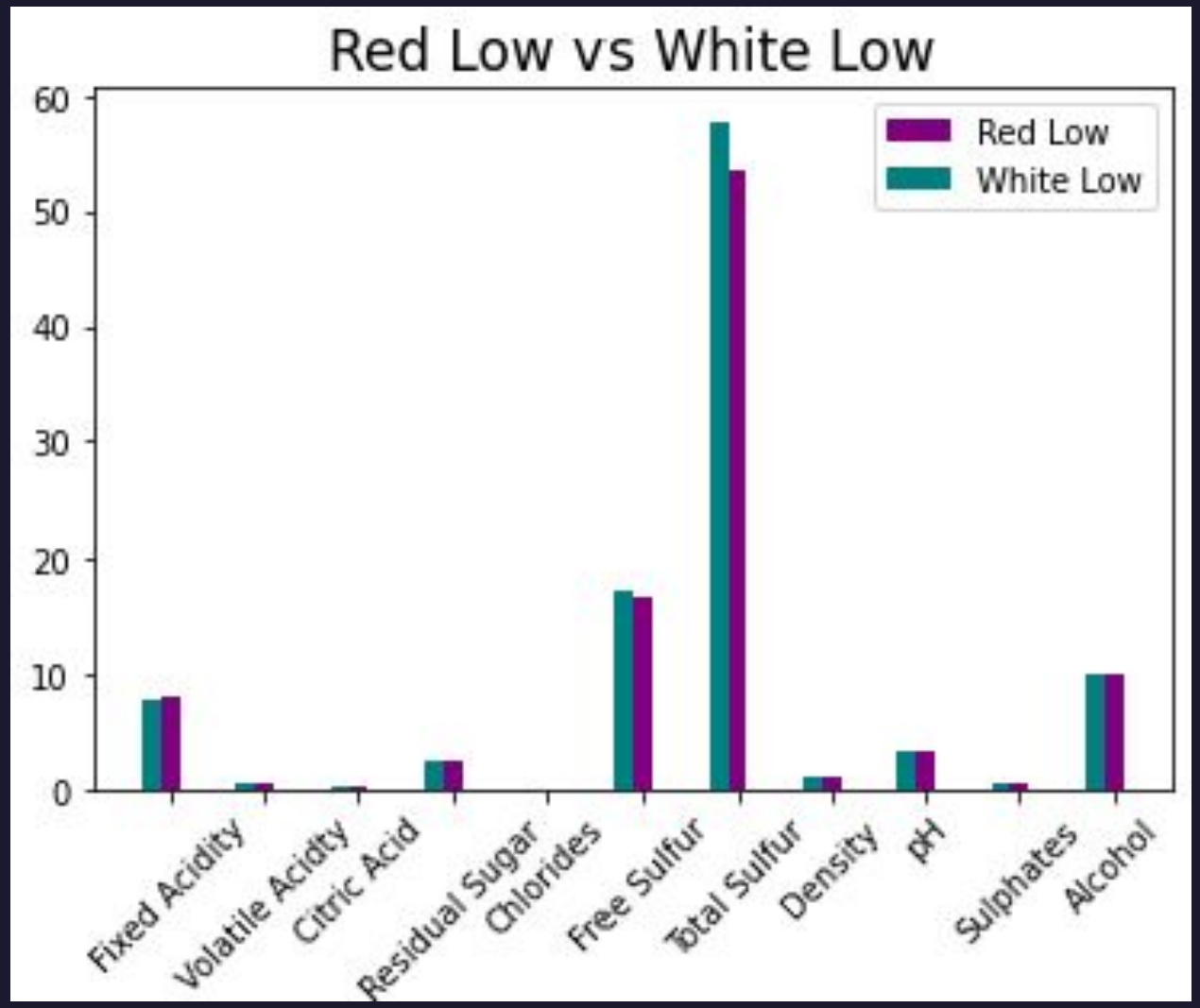
- Free Sulfur Range: 30%-40% Average
- Total Sulfur Range: 120%-140% Average
- Residual Sugar Range: 5%-10% Average
- Alcohol Range: 10%-15% Average



Low-Quality Red & Low-Quality White Wines

ATTRIBUTES OF LOW-QUALITY WINE

- Free Sulfur Range: 15%-20% Average
- Total Sulfur Range: 50%-60% Average
- Residual Sugar Range: 1%-5% Average
- Alcohol Range: 10%-15% Average



Limitations

CONSIDERATIONS

1 Quality is subjective

2 Doesn't account for all the different regions of wine

3 Doesn't account for how the wine is made

Thank You

Wine Quality

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