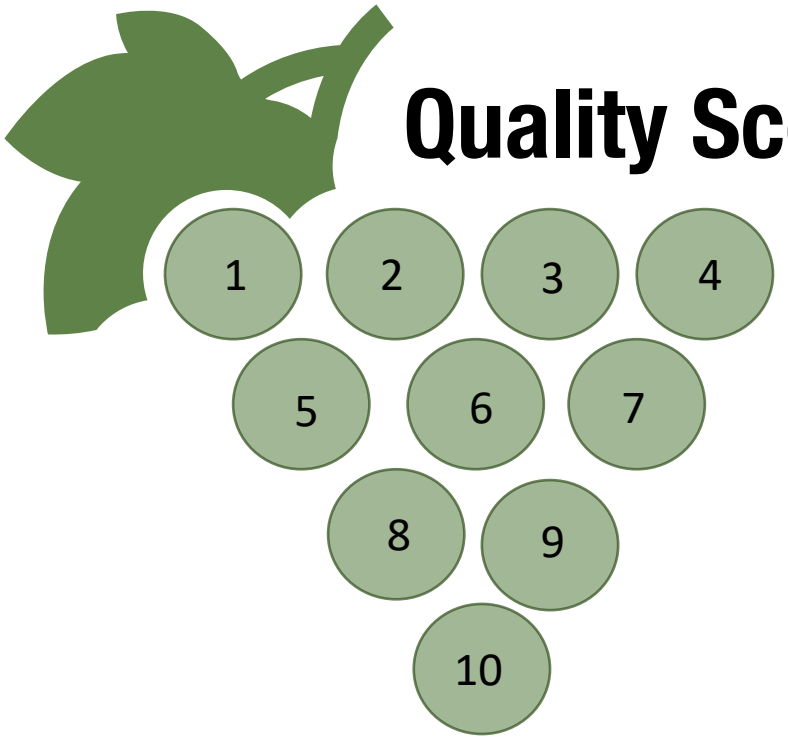
What makes a good white wine?

Can you predict the basic quality of a wine?

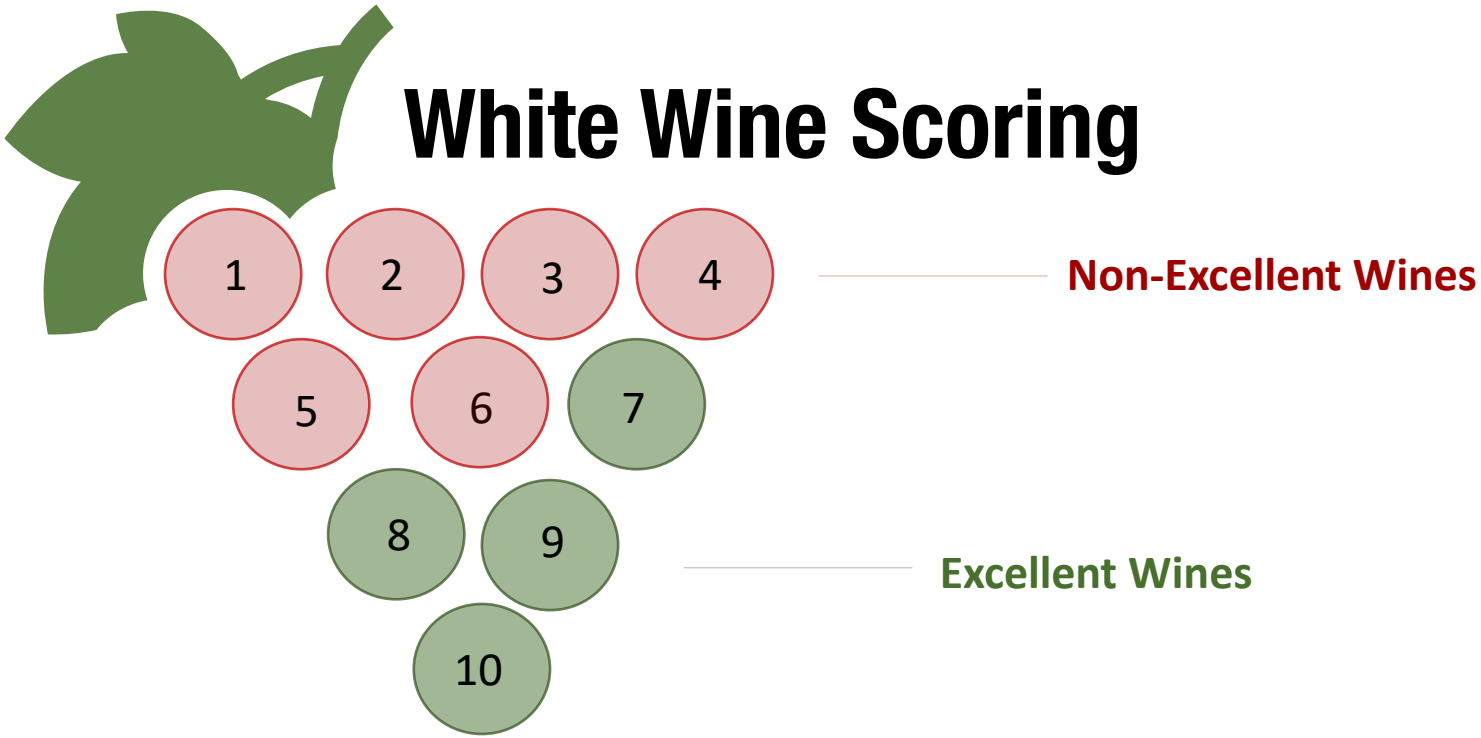
What makes a good white wine?

Do certain properties correspond with higher quality wines?

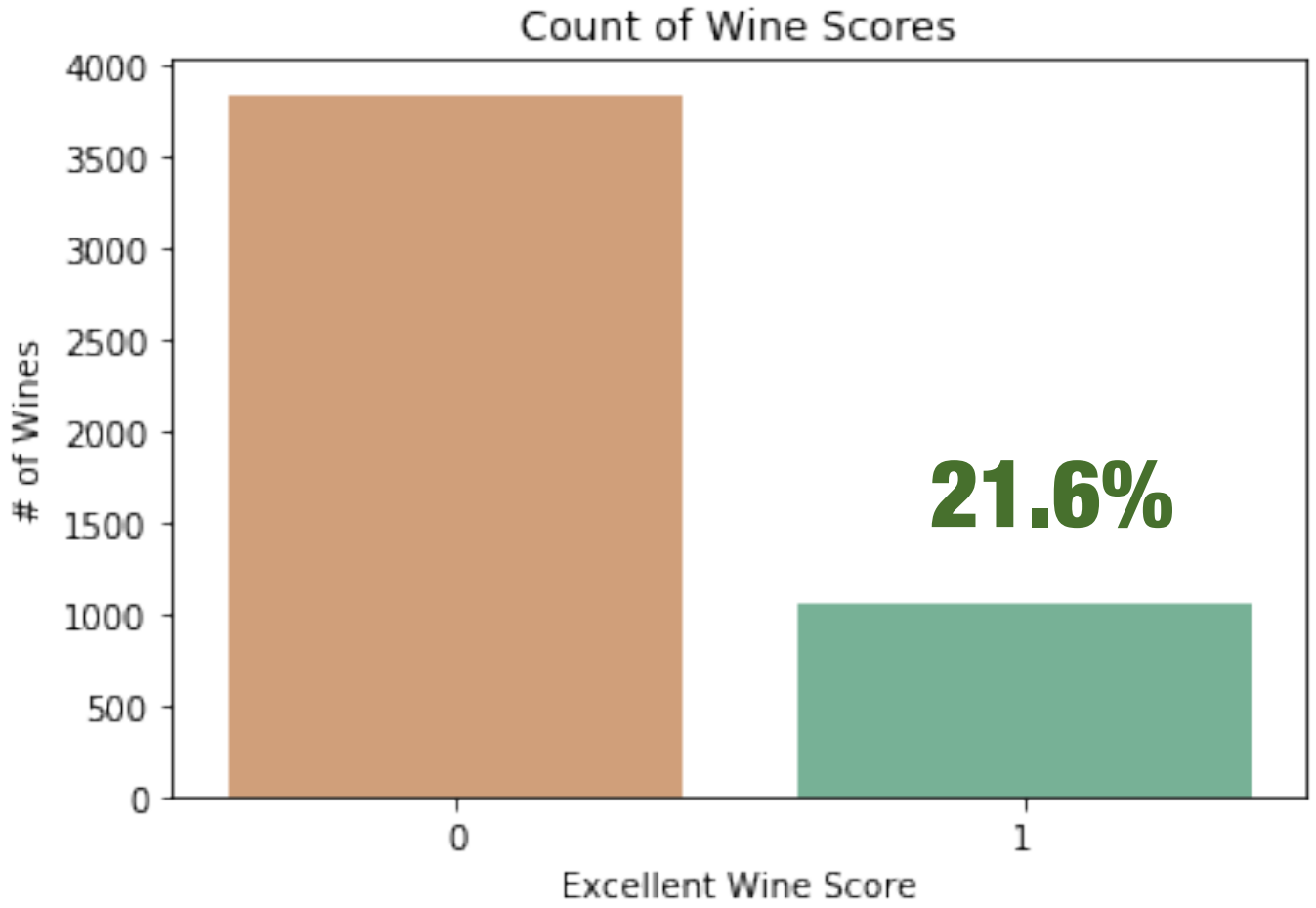


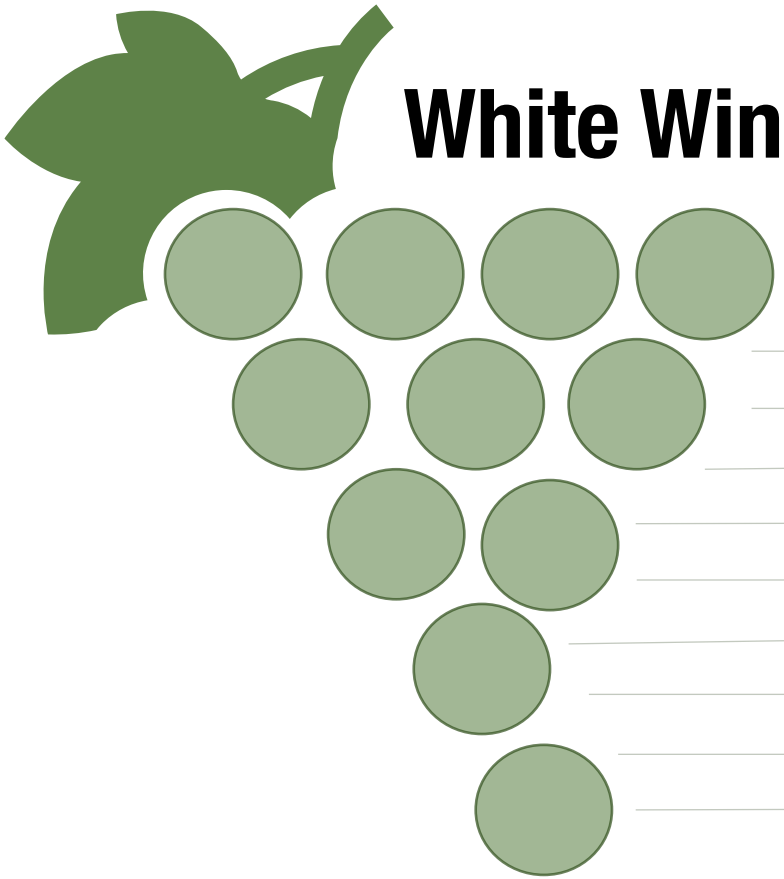
Three or more wine experts evaluated the white wines and gave them scores from 1 to 10.

White Wine Scoring



The majority of the 4000+ white wines were not excellent.





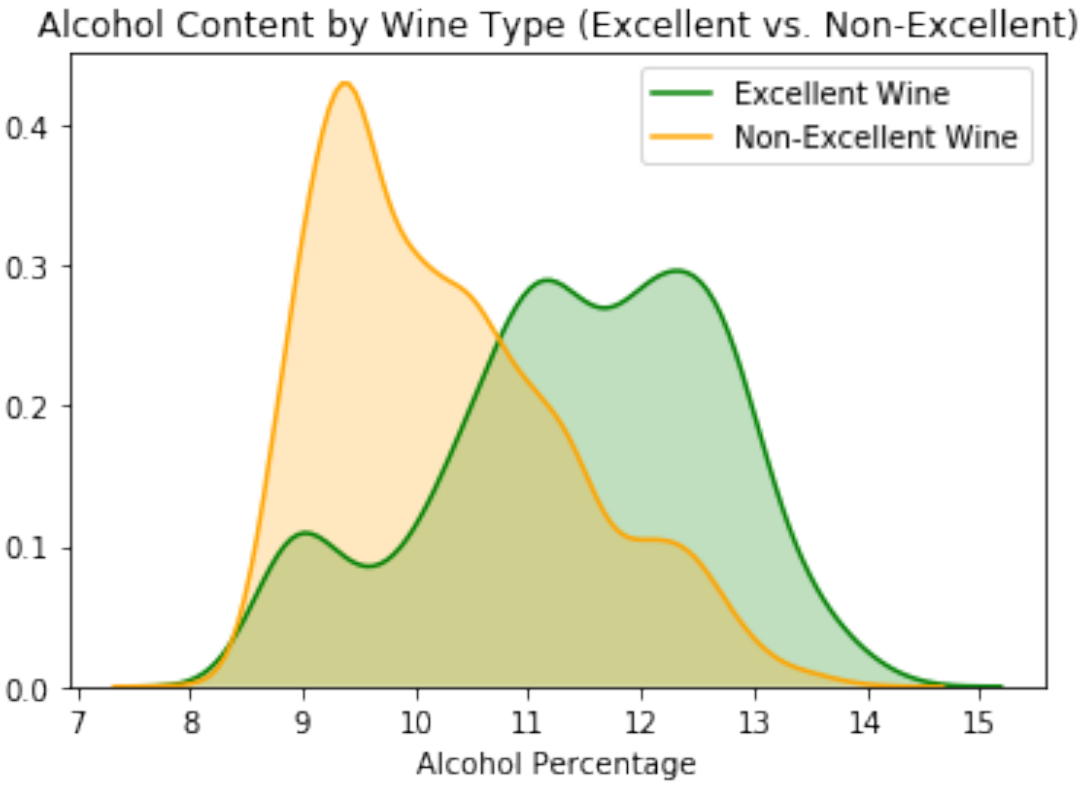
White Wine Properties

- fixed acidity
- volatile acidity
- citric acid
- residual sugar
- chlorides
- free sulfur dioxide
- total sulfur dioxide
- density
- pH
- sulphates
- alcohol

The data on the Portuguese "Vinho Verde" wine and the properties of its varieties.
Link: https://archive.ics.uci.edu/ml/index.php

P. Cortez, A. Cerdeira, F. Almeida, T. Matos and J. Reis.
Modeling wine preferences by data mining from physicochemical properties. In Decision Support Systems, Elsevier, 47(4):547-553. ISSN: 0167-9236.

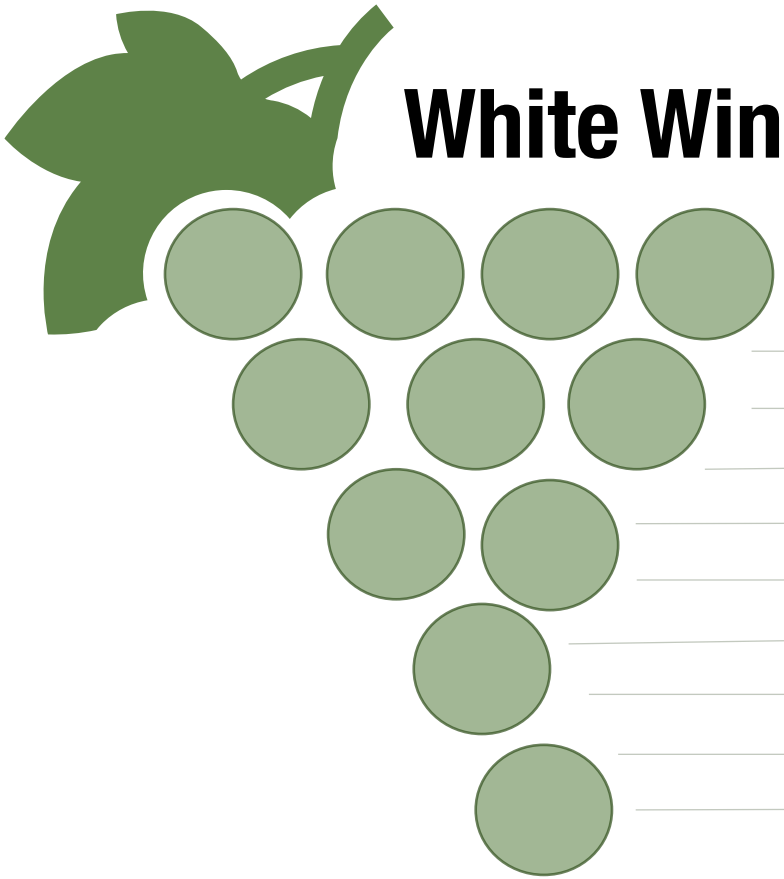
Alcohol content seems to have some effect on basic quality score of a white wine



The Random Forest Classifier was most adept at predicting wine quality

Model Type	Score
Random Forest	0.868707
Decision Tree	0.821088
Logistic Regression	0.797959

White Wine Properties



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alcohol

The data was not balanced

21.6%

You can use a different scoring metric:

- **Confusion Matrix**: a table that shows correct predictions and incorrect predictions and determines accuracy. Of the total predictions made, how many excellent and non-excellent wines did the model correctly predict
  - **Precision Scoring**: How many of the wines labelled as excellent are actually excellent?
  - **Recall Scoring**: Of all actual excellent wines, how many did we predict?

You can transform the data:

- Under-sample the non-excellent wines
- Over-sample the excellent wines
- Build synthetic samples