Predicting Wine Quality: A Conundrum

Would you like some cheese with that?

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Outline

1. Introduction
2. Machine Learning Methods
3. Findings
4. Discussion

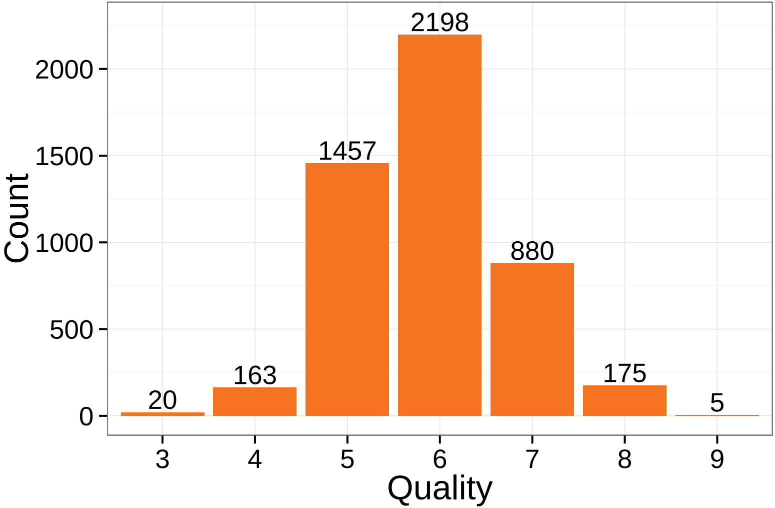
Task

Predict the blind taster quality score of a wine based on chemical tests.

Data

- Two Datasets: Red & White vinho verde wine samples from northern Portugal
- 1599 & 4898 rows, respectively
- 11 Explanatory variables: measurements from various phytochemicals in wine
- Response variable ”quality” is discrete variable on ordered scale from 0 (worst) to 10 (best)

Quality


Count
2000
1500
1000
500
0
20
163
1457
2198
880
175
5
3
4
5
6
7
8
9
Quality

Training and Testing Sets

- Training and Testing set constructed through stratified sampling.
- Quality variable was the strata
- Why: Ensure representation of all quality categories in both Training & Testing datasets.
- How: 37.5% of items (rounded up) in strata were randomly selected to be in the testing set. Remaining 62.5% were the training set.
- Same training & testing sets used for each analysis type.

Regression

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Classification

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Random Randomness is Random

- 75% of Quality ratings were either 5 or 6.
- Is randomly assigning 5 or 6 to everything as good as, or better than, our other methods?
- Using `rbinom(1,1,0.6014)`, 1s were predicted as quality 6, 0s as quality 5
- Probability of 60.14% because from Training Set, considering only 5s and 6s, 6s were 60.14% of total observations
- Our base line success rate to compare other methods.

Regression: 50% Success Rate

content... change success rate in title

Classification: 50% Success Rate

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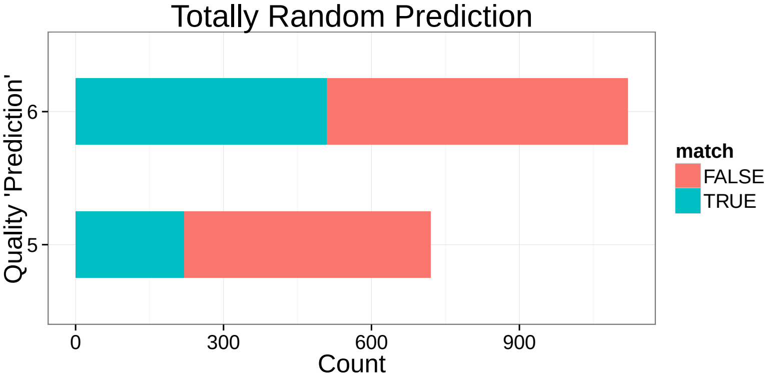
Random 'Prediction': 39.67% Success Rate

Turns out, that's not really a great 'prediction' method. Who knew?



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