RATING RED VINHO VERDE

A data-driven guide for restaurant managers

NOROFF DINNING GROUP

Agenda

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Dataset overview
Initial modeling approach
Improved approach
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Practical implication and next steps
Conclusion

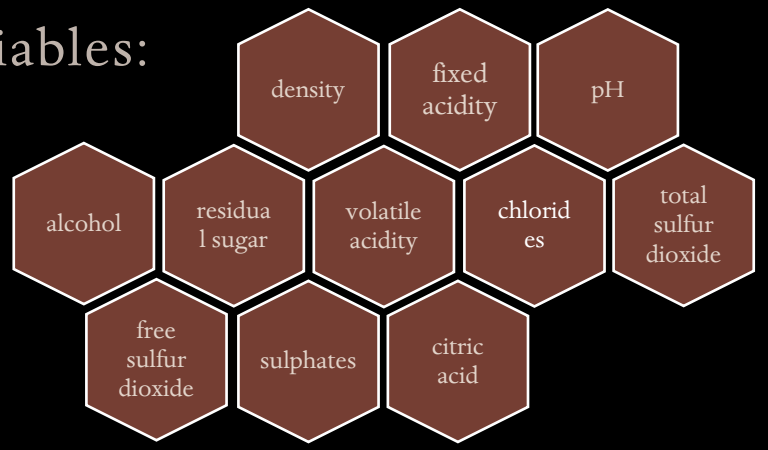



Introduction

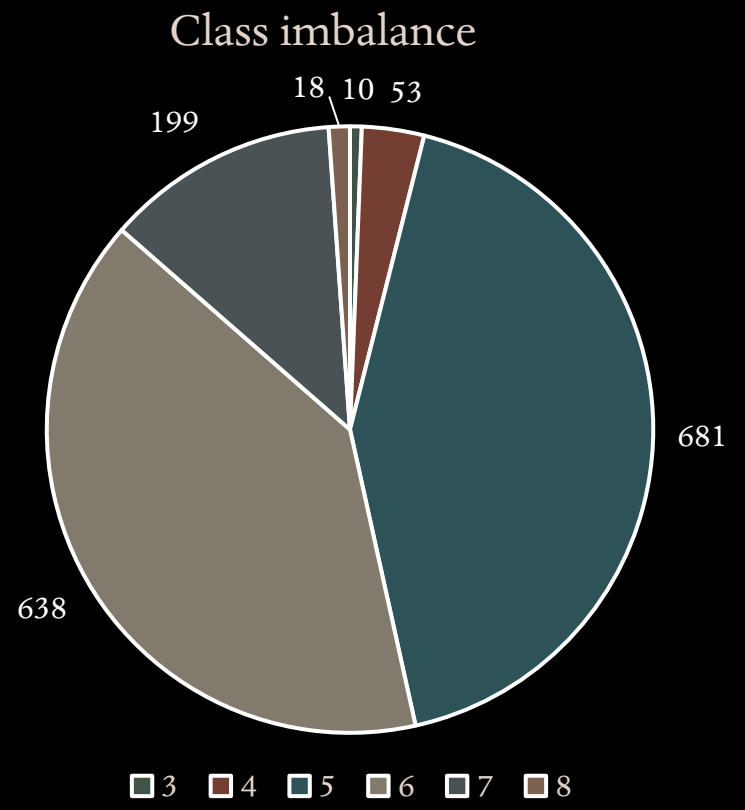
Wine quality plays a key role in customer satisfaction and sales. Using physicochemical data samples of Red Vinho Verde, a model was developed to predict wine quality. This tool will help optimize inventory, reduce waste, and better match customer preferences. Let's walk through the process and key insights from the model.

Dataset overview

- Size: 1,599 samples of Portuguese red Vinho Verde
- Variables:



- Target variable: Wine quality (0-10)
- Quality imbalance



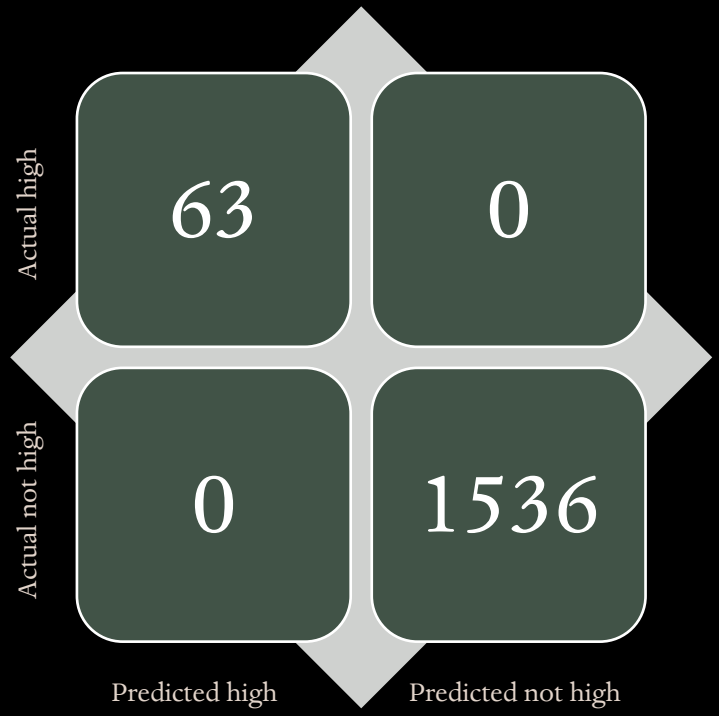
Initial modeling approach

BINARY LOGISTIC REGRESSION

Example: High vs not High

Result:

- Very high accuracy
- Requires class separation
- Oversimplifies multi-class problem



Initial modeling approach

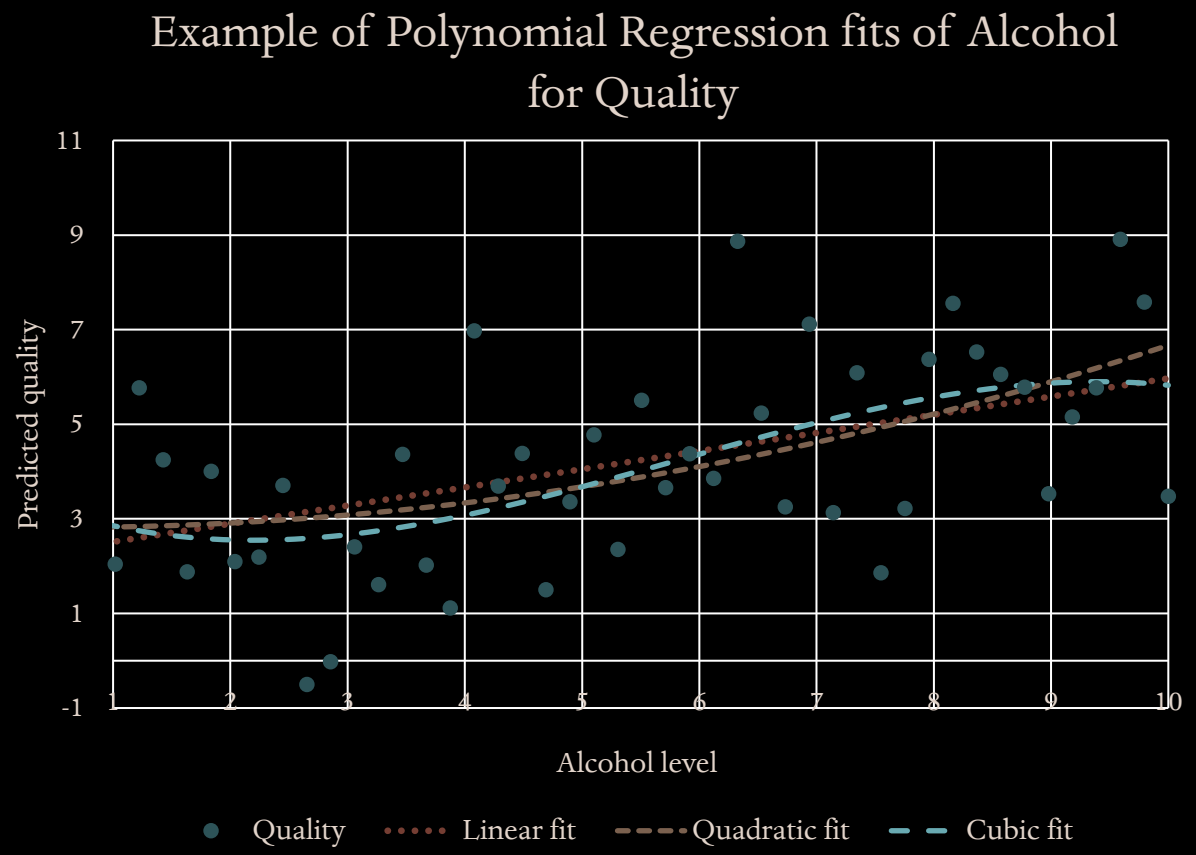
POLYNOMIAL REGRESSION

Terms used:

- Alcohol x Sulphates
- Sulphates²
- Alcohol²

Result:

- Captures complex patterns but shows tendency to overfitting
- Struggles to predict Low and High quality wines

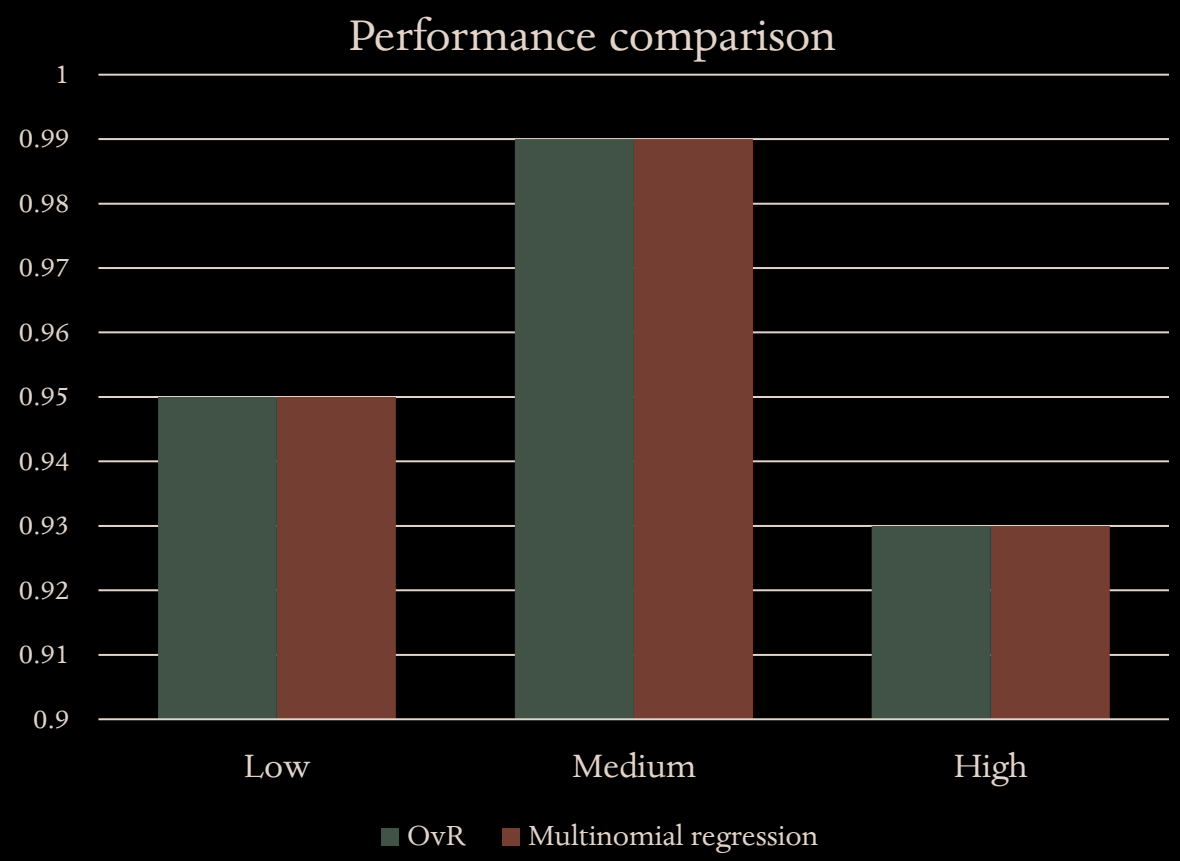


Improved Approach: OvR and Multinomial Regression

- OvR: Treats each class as a separate binary classification problem.
- Multinomial Regression: Handles all classes simultaneously in one model.

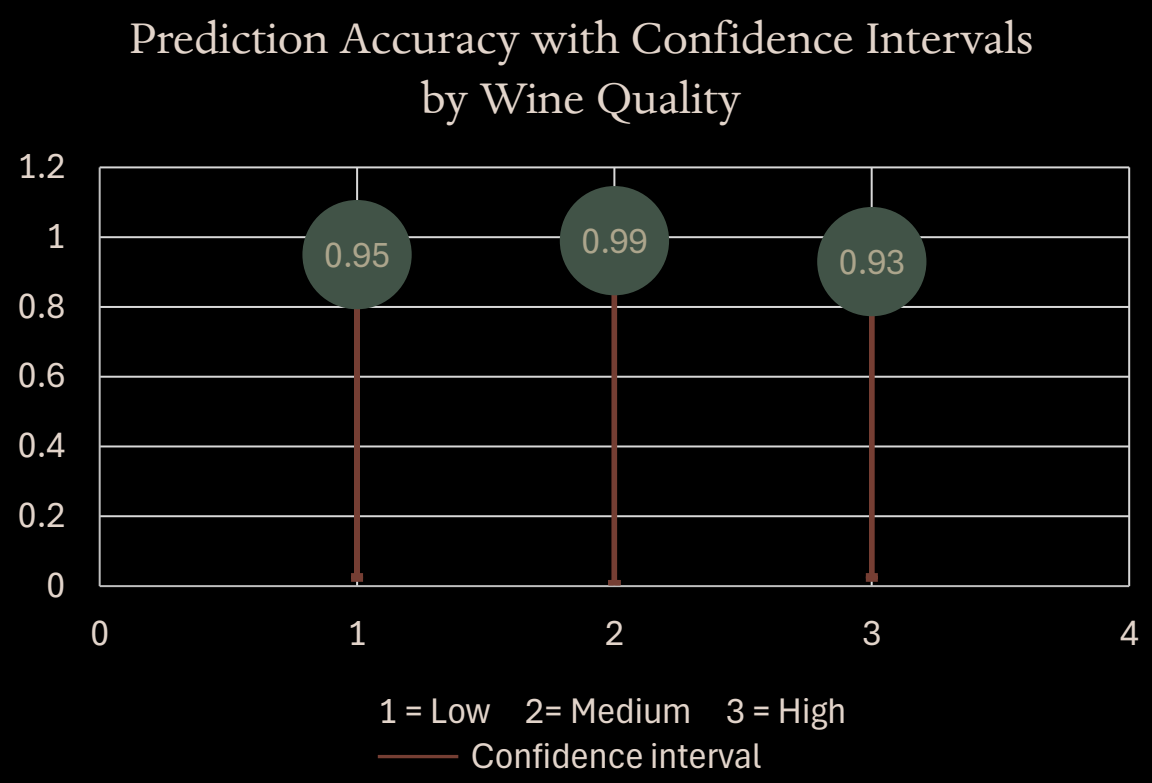
Results:

- Both methods provide similar performance, but multinomial is computationally efficient and interpretable.



Model Performance

- Overall model accuracy: ~95.6%
- Need to further evaluate predictive power for Low and High classes.
- Challenge due to imbalanced data (medium wines dominate).



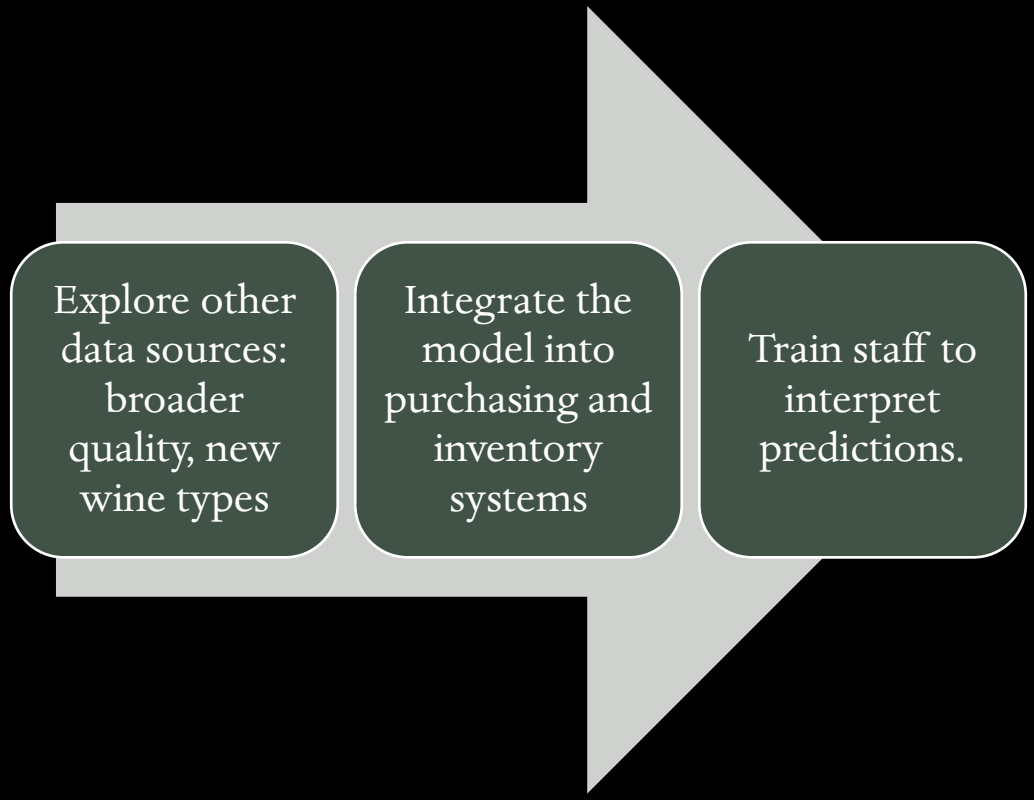
Practical information and next steps

WHY USE THE MODEL?

- Select higher-quality wines for premium offerings.
- Identify cost-effective wines with similar characteristics to high-quality wines.
- Optimize inventory based on predicted quality.

Limitations: Requires further testing on diverse wine datasets for broader applicability and improve quality balance.

NEXT STEPS



Conclusion

- Accurate predictions for Medium quality wines
- Challenge with imbalanced data
- Highly valuable tool for strategic decision-making
- The way ahead: keep training and improving the model

Thank you

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2024

Additional content: presentation insights

"Noroff Dinning Group" is a ficticious concept purposely created to recreate the project scenario in a more realistic way. It is a restaurant chain, yet wants to give the sensation of fine dining. Following this logic, the aestethics were consequently created.

WRITTING

- Professional tone
- Have in consideration presenter an audience may not be technical
- Avoid using highly technical terms or formulas
- Little text, focus on presenter

VISUALS

- Elegant colours, browns for earth, greens for leaves, reds for wine
- Pleasant and easily non-complex charts
- All images are modified in different degrees.
- Image style: soothing, elegant and positive landscapes
- Logo created as a wink to Noroff's School logo (shield) with an elegant twich

EFFECTS

- Sticking to the elegant and simple theme, playful animations are avoided

Image sources

- Image 1: “Vineyard landscape”, author unknown, from https://www.kimkim.com/c/wine-regions-in-italy. No copyright ownership implied; for reference only.
- Image 2: “Noroff Dining Group logo” made with Gimp.
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