

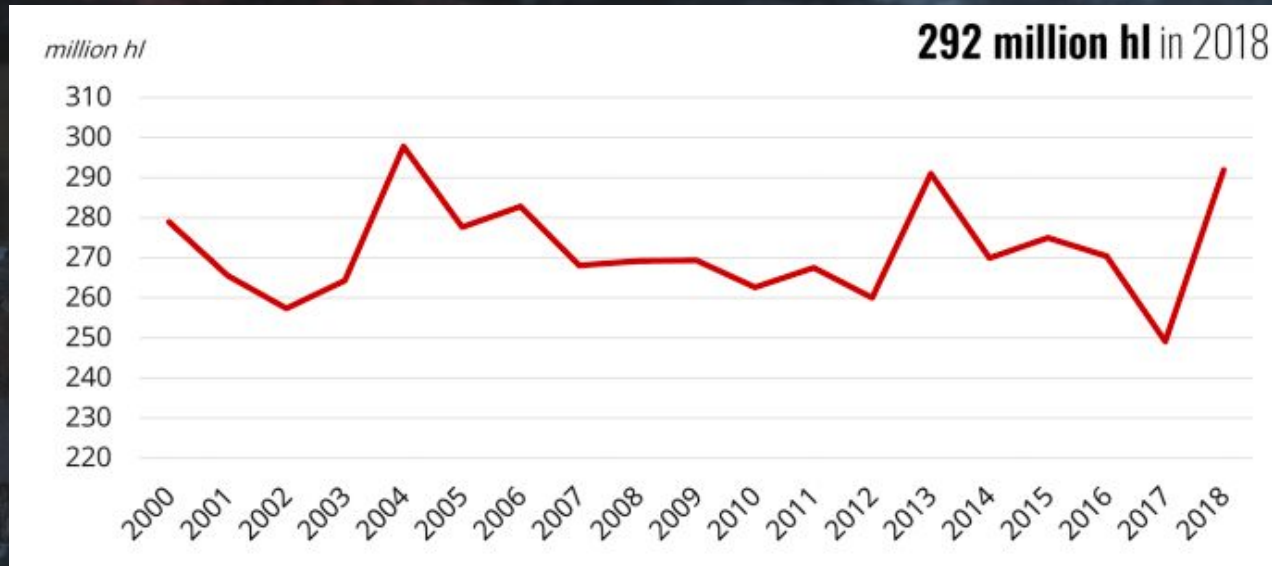
Wine Quality & Machine Learning

January 2020
Aroa Gomez



Global Wine Production & Demand

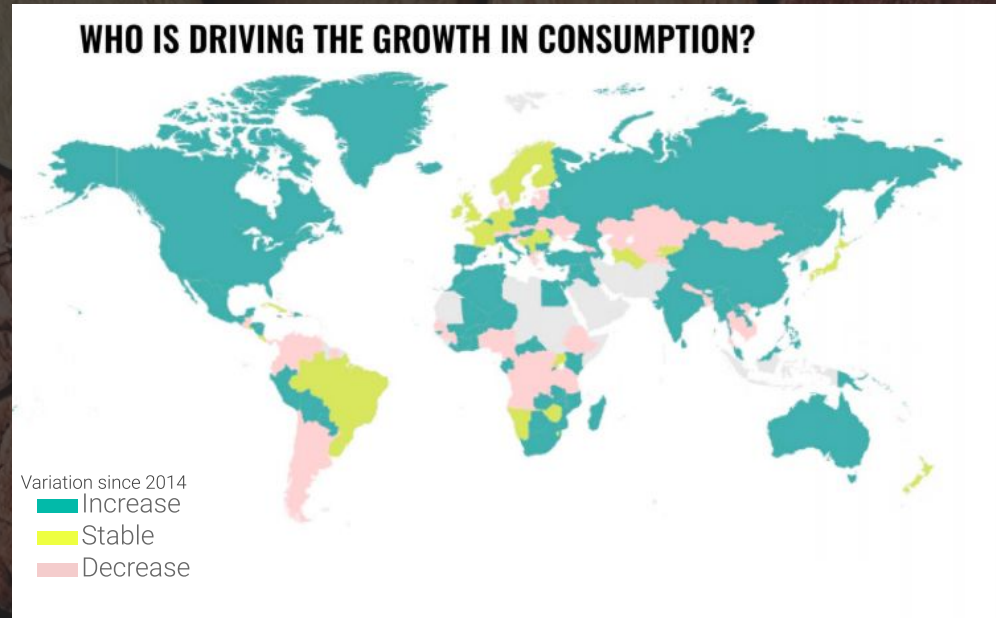
- ❖ Wine Production recovers from three years decline



Source: The OIV - 2019 Wine Production First Estimations

Global Wine Production & Demand (II)

Wine demand is not just driven by traditional winemaker territories but also less established regions

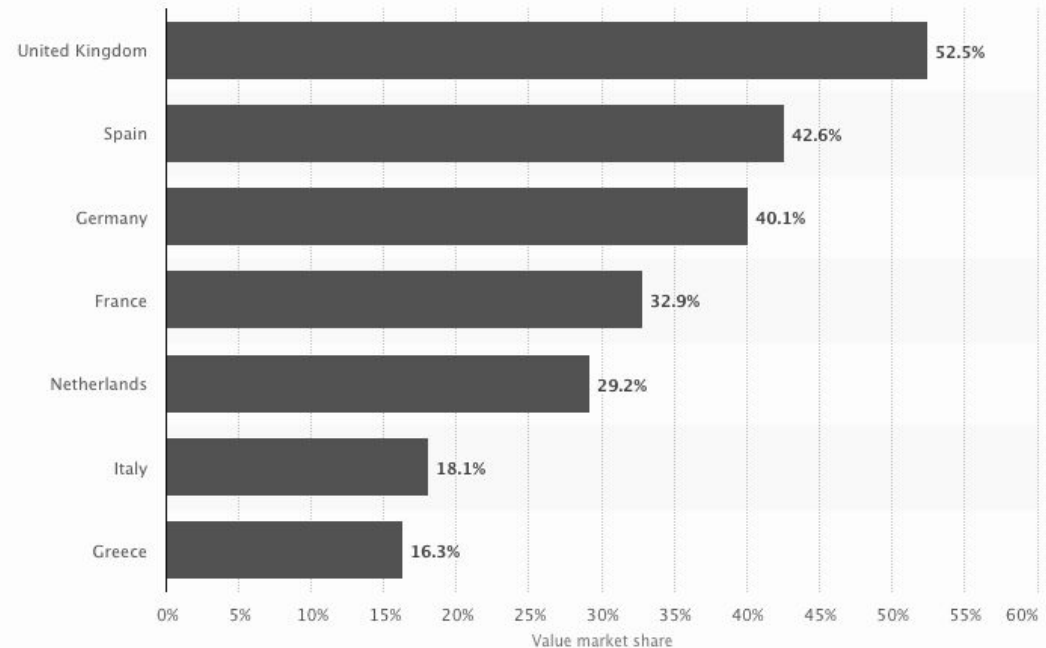


Private Labels Market

❖ Private label wines keep gaining market share in Europe

❖ Tasting and Valuation can be tedious and expensive

Private Label Wine Market Share

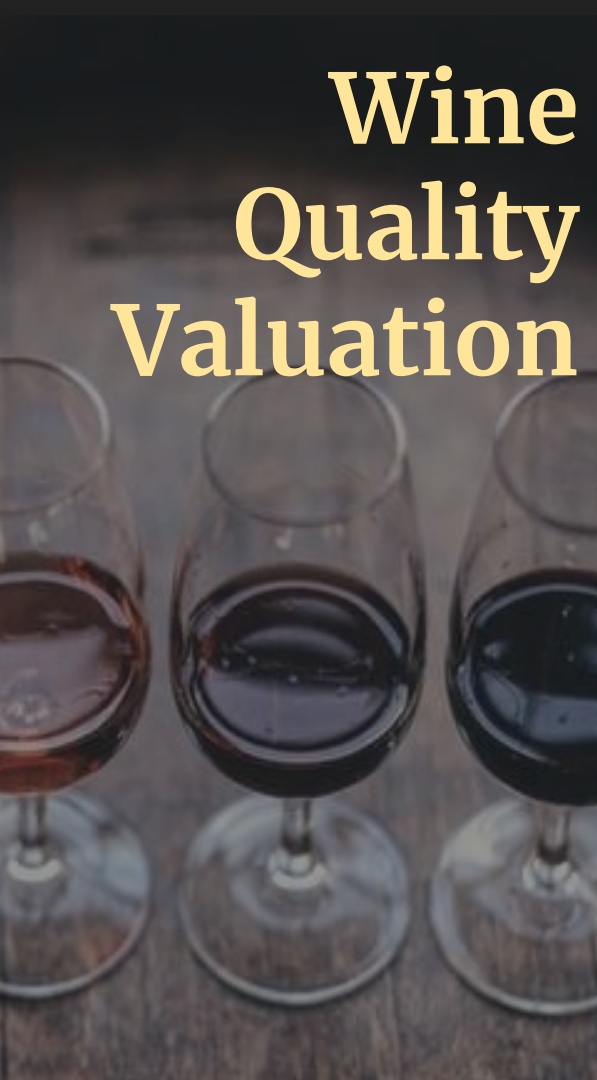


Source: Statista, Consumer Goods & FMCG

Professional Tasting



- ❖ Wine Valuation is Not all that objective
- ❖ Wine Origin will skew the valuation
- ❖ Each Taster Will give different valuation

A vertical image on the left side of the slide shows three wine glasses filled with red wine, arranged in a row on a wooden surface. The glasses are partially filled, and the wine has a deep red color. The background is dark and out of focus.

Wine Quality Valuation

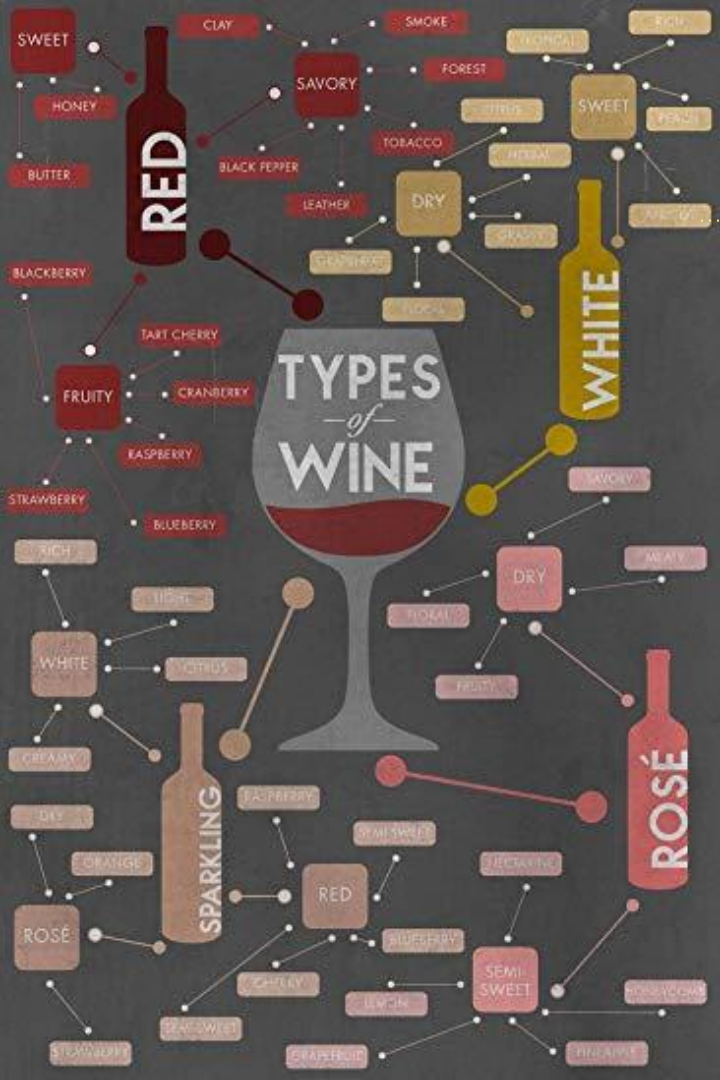
Why Machine Learning Valuation?

- ❖ Wine Rating with no hassle: No sample delivery | No tasting Events
- ❖ Unbiased
- ❖ Simplified valuation

How does the Algo Work?

- ❖ It relies on the Physico-Chemical Characteristics of your Wine
 - Alcohol
 - S02
 - pH
 - Sulphates
 - Acidity
 - Residual Sugar
- ❖ All we need is an 'Analysis Report'
- ❖ You get instantly your rating





Algorithm Limitations

- ❖ Wine Rating is still history dependent (biased residuals)
- ❖ Not all types of wines are captured - limited to red and white
- ❖ Less accurate for outstanding and bad wines rating

Thank You



Q&A

Appendix



The Data

6,500 wines: 1,600 red and 4,900 white.

- **fixed acidity:** fixed acids found in wines gives a sour taste.
- **volatile acidity:** High content of volatile acidity refers to vinegars but it's also used to add complexity to the wine
- **citric acid:** it is added to wines as a stabiliser and to complement flavor or increase 'fresh' flavor.
- **residual sugar:** defines the wine sweetness, from dry (0-9 g/l) to sweet (+120 g/l)
- **free sulfur dioxide (SO₂):** prevents oxidation and microbial growth. It can give fruity taste but in high concentration can produce a sharp/bitter/chemical flavor
- **total sulfur dioxide(SO₂):** give a sense of how “clean” a wine is.
- **density:** density of wine is determined by the concentration of alcohol, sugar, glycerol, and other dissolved solids
- **pH:** Low pH wines taste tart and crisp.
- **sulphates:** it's a preservative. It maintains color and flavor. Some believe that adding sulfites negatively affects wine flavor

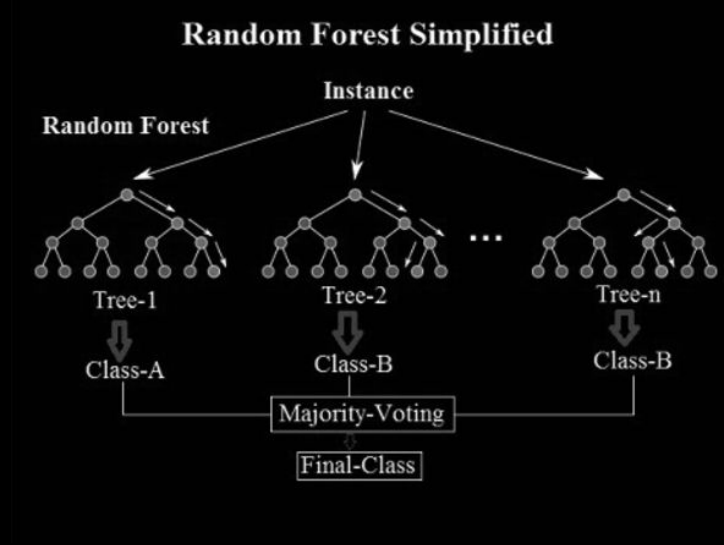
The Algorithm

ML Testing:

- Multiclass-Logistic regression
- Support Vector Machine (SVM)
- Random Forest Multi-class
- KNN Classifier
- Random Forest Multi-class Classifier

Best Model:

→ Random Forest (80% avg. accuracy)



Algorithm Input & Output

Input → Client's Reports

N° Echantillon :	23219
Appellation :	FUBL
Couleur :	Blanc
Millésime :	2018
TYPE D'ANALYSE	
Titre alcoométrique volumique (% vol.)	13,60
Glucose Fructose (g/L)	0,6
Acidité volatile (g/L acide sulfurique)	0,64
pH	3,10
SO2 Libre (mg/L)	< LQ (3)
SO2 Total (mg/L)	35
Protéines	Forte présence
Essai collage	*

Couleur		Rouge
Millésime		2018
N° cuve		-
Volume		-
Degré alcoolique	% Vol	13.39
Glucose-Fructose	g/L	1.1
Degré en puissance	% Vol	0.06
Acidité totale	g/L H ₂ SO ₄	3.23
	még/L	65.86
Acidité volatile	g/L H ₂ SO ₄	0.52
	még/L	10.60
SO2 Libre	mg/L	15
SO2 Total	mg/L	38
pH		3.60
CO2	mg/L	545

→ **Prediction** → **Output** → Class(1, 1, 2, 1,..)

Where Class 0: below average wine

Class 1: average/good wine

Class 2: above average wine

Feature Importance

