Bootcamp Kaggle competition

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Outlines

1. Introduction
2. Explanatory Data Analysis
3. Feature Engineering
4. Algorithms Used
5. Conclusion

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Introduction

- Predicting the price of wine based on a collection of reviews and other product features.
- We use the Random Forest Regressor and the XGBoost Algorithm to predict the prices of wine.

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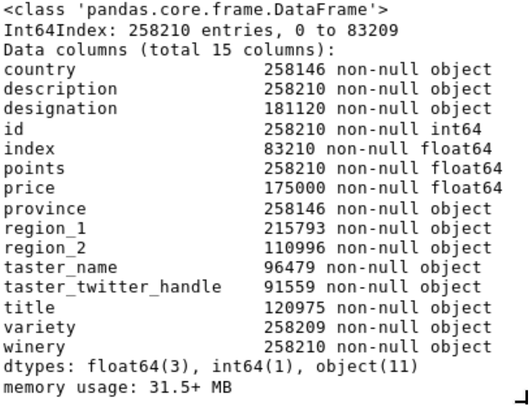
Explanatory Data Analysis

Let's start looking the information about our data.

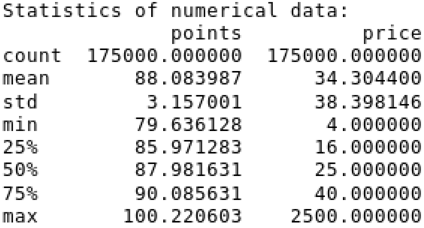


```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 258210 entries, 0 to 83209
Data columns (total 15 columns):
country                  258146 non-null object
description              258210 non-null object
designation              181120 non-null object
id                       258210 non-null int64
index                    83210 non-null float64
points                   258210 non-null float64
price                    175000 non-null float64
province                 258146 non-null object
region_1                 215793 non-null object
region_2                 110996 non-null object
taster_name              96479 non-null object
taster_twitter_handle    91559 non-null object
title                    120975 non-null object
variety                  258209 non-null object
winery                   258210 non-null object
dtypes: float64(3), int64(1), object(11)
memory usage: 31.5+ MB
```

- We can see that the total number of columns is 15
- We can also see the number of non-null value of each columns and their type.

Explanatory Data Analysis

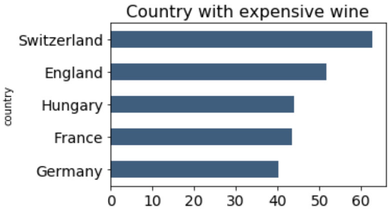
Now let's look at the distribution of Points and Prices

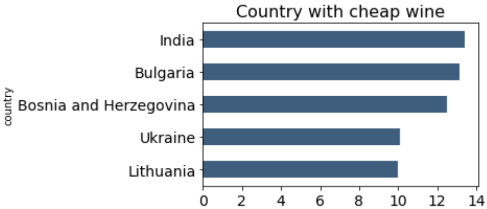


```
Statistics of numerical data:
              points          price
count  175000.000000  175000.000000
mean       88.083987      34.304400
std         3.157001      38.398146
min        79.636128       4.000000
25%        85.971283      16.000000
50%        87.981631      25.000000
75%        90.085631      40.000000
max       100.220603    2500.000000
```

- The values of points are distributed between 80 and 100
- Mean price of 34.3 and average points is 88

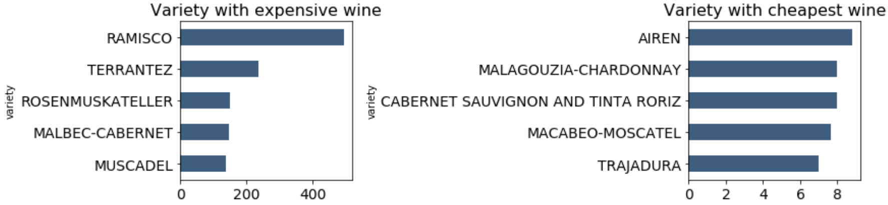
Explanatory Data Analysis





- Most expensive wine is from Switzerland
- Cheapest wine is from India

Explanatory Data Analysis



- Most expensive variety is Ramisco.
- Cheapest variety is Airen.

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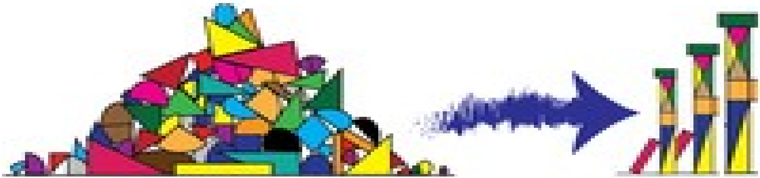
Feature Engineering



- Label encoding
- One Hot Encoding
- TF-IDF

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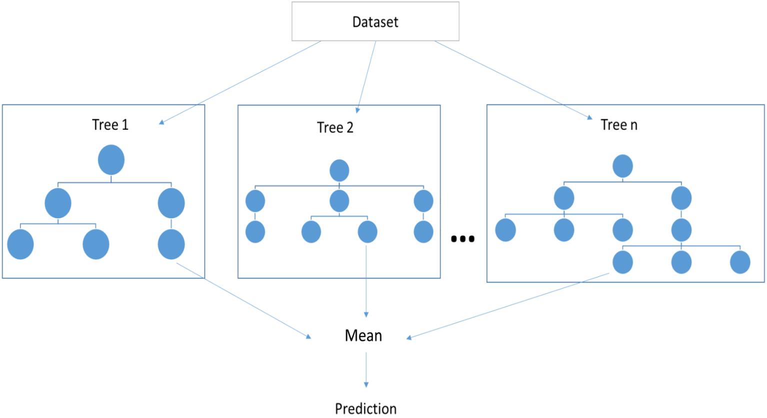
Random Forest Regression

Random forest is a Supervised Learning algorithm.



XGBoost

- Supervised machine learning algorithm
- Predicts target variable by combining estimates of simpler, weaker models.
- Incrementally building an ensemble by training each new model instance to emphasize the training instances that previous models mis-classified.

Results

Model	RMSE (Validation)	RMSE (Test)
Random Forest Regressor	21.6	
XGBoost Regressor	23.8	
XGB + Random Forest	22.7	20.43

- 10-Fold cross validation applied in both models.
- Random Forest performs better than XGBoost.
- Combining the models gives even better results.

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Conclusion

Two models were used with cross validation. Their predictions were averaged and RMSE of 20.4 was achieved.

References

- http://webdropin.com/wordpress99/answering-wine-related-questions-with-data/
- https://www.udemy.com/course/feature-engineering-for-machine-learning/

THANK YOU
FOR YOUR
ATTENTION