Gruppenarbeit: Vorhersage einer «buy, hold, sell» - Strategie

Gruppe 1

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Inhaltsverzeichnis

Data Preprocessing I

NaN and Zero Values

- Remove features with a percentage of NaN and Zero Values over thresholds of 50% and 40% respectively

Outliers

- Handling per sector per year
- Replace data points above or below a certain quantile with the respective quantile value

Imputing Missing Values

- Last preprocessing step before splitting the data set into training and test sets
- Per sector per year
- Impute NaN values with median

Data Preprocessing II

Train/Test split

- Played with different thresholds
- Decided to go with a 70/30-split for our final run

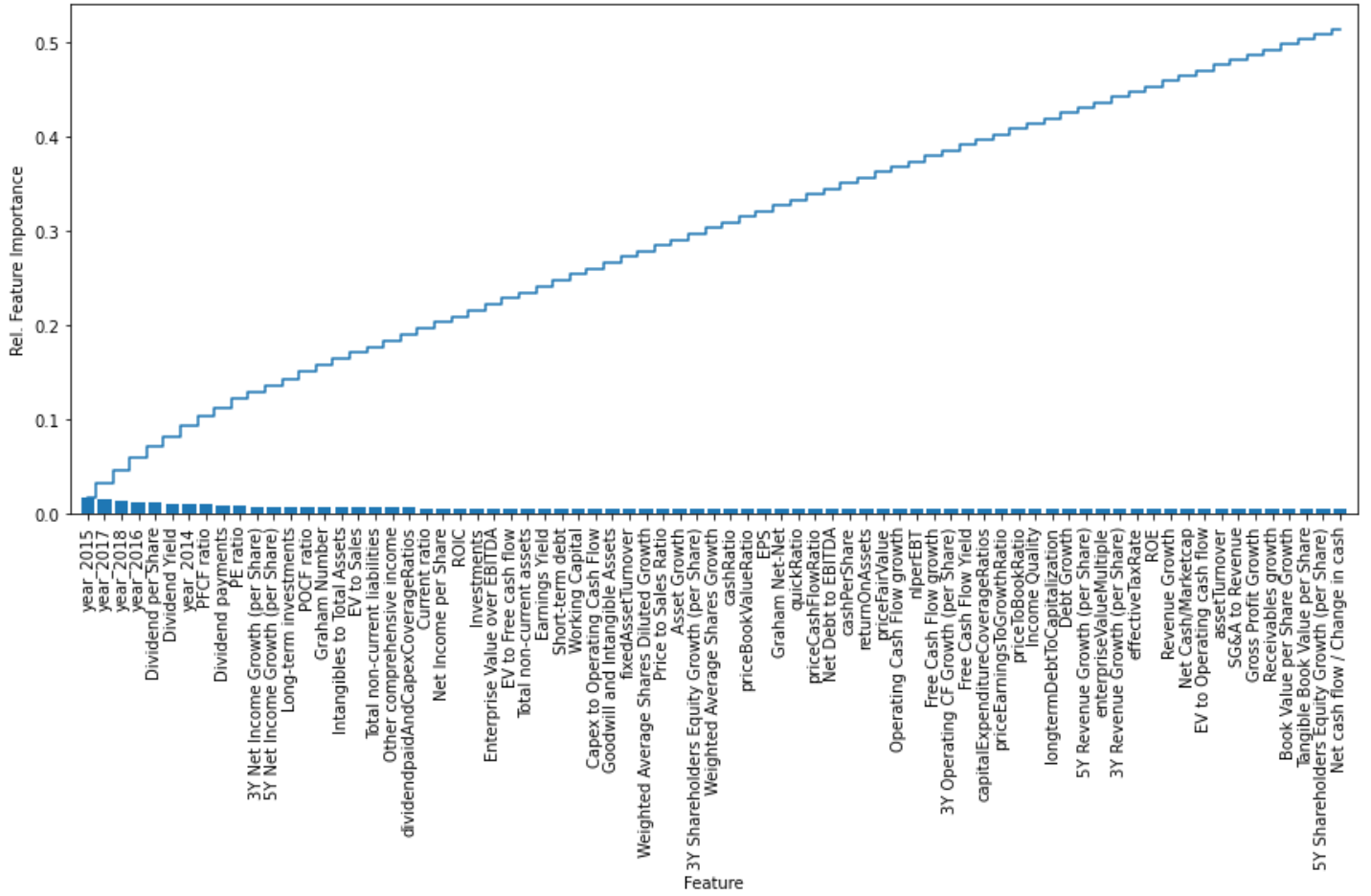
Class Imbalance

- Balance after the train/test split on the train set → test set does not contain artificial data which happens while balancing
- K-nearest neighbors = 10

Feature Selection

- Select all features with at least 0.55% relative feature importance → 81 features left
- Comes out that years and sectors are very important features

Feature Selection



Algorithms

Random Forest / Decision Tree	SVM	LDA / QDA	Keras Sequential Model
- Intuitive classification process - Flexible - Two of the most used algorithms for classification problems	- Rather disappointing score - Runtimes went into hours → not 100 percent sure if we have found the best parameters - Unlikely that the score would improve onto the level of Random Forest	- Dimensioality reduction technique - Reduces high-dimensional data sets onto a lower-dimensional space - Less computational costs because of lower dimension - LDA assumption of a common covariance matrix	- Deep learning framework - Most used framework among top-5 winning teams on Kaggle - Layer-by-Layer model creation - Three layers resulted in the best score

Algorithms – Results

Method	Best Score
Random Forest	61.44%
Decision Tree	60.39%
LDA and QDA	57.58%
Keras Neural Network	56.08%
Support Vector Machine	41.09%

Conclusion

- At first, we asked ourselve what accuracy score we would be aiming for → 65-75%
- Just predicting «sell» would have resulted in a score of 53% → we managed to push the score up by prediting «buy» and «hold» in an acceptable manner
- We are convinced that if we woud get real world data we would achieve similar scores → we didn't artificially improve our test score by removing too many outliers
- More computational power would be useful for applying the GridSearch algorithm and trying out different threshold levels for the algorithms → thershold sensitivity as room for improvement
- Data preprocessing is a very important step and with a looser time restriction different ways of handling a task can be deeper investigated
- Feature selection as an important component