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

Gruppe 1

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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

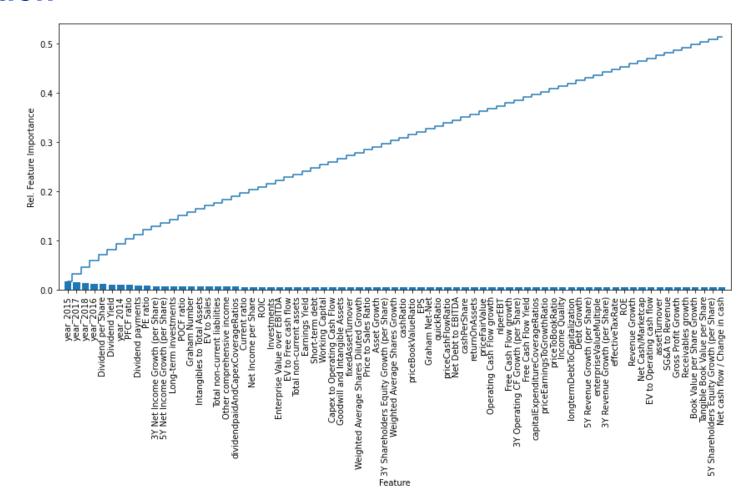
Class Imbalance

- 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	56.60%
Keras Neural Network	56.58%
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 would 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