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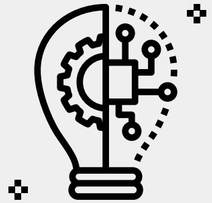
Bank marketing campaign using Machine Learning

Predicting the success of a bank marketing campaign

Motivation
Data preperation process
Unsupervised Machine Learning
Supervised Machine Learning
Conclusion limitations

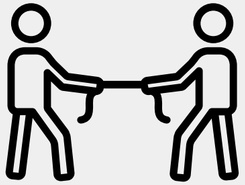
Motivation

Why should companies develop efficient marketing campaign?



Increasing use of technology

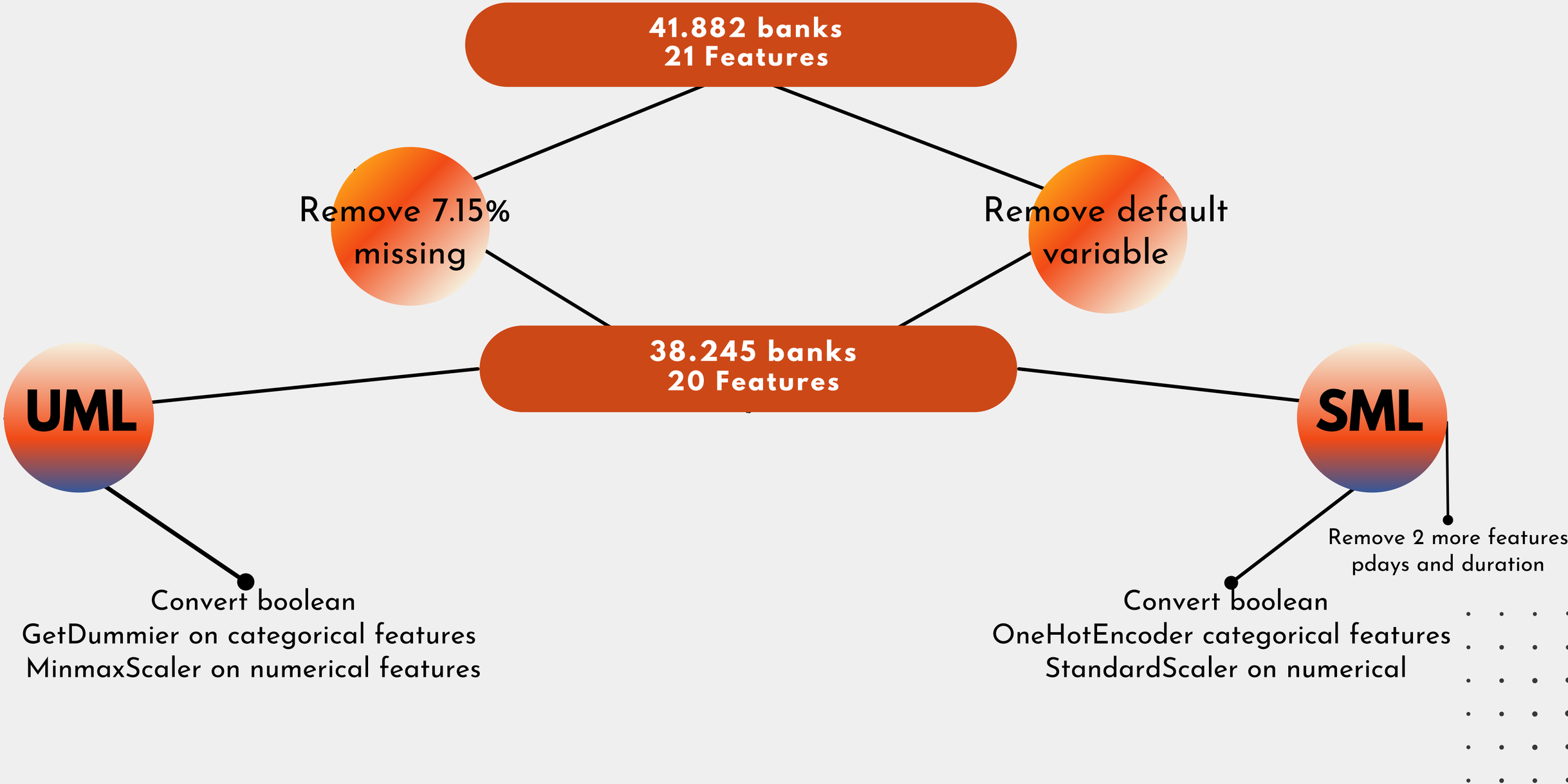
Companies this as a platform to sell product



High competion
Information overflow

Increase Sales

Data preparation process



Unsupervised Machine Learning

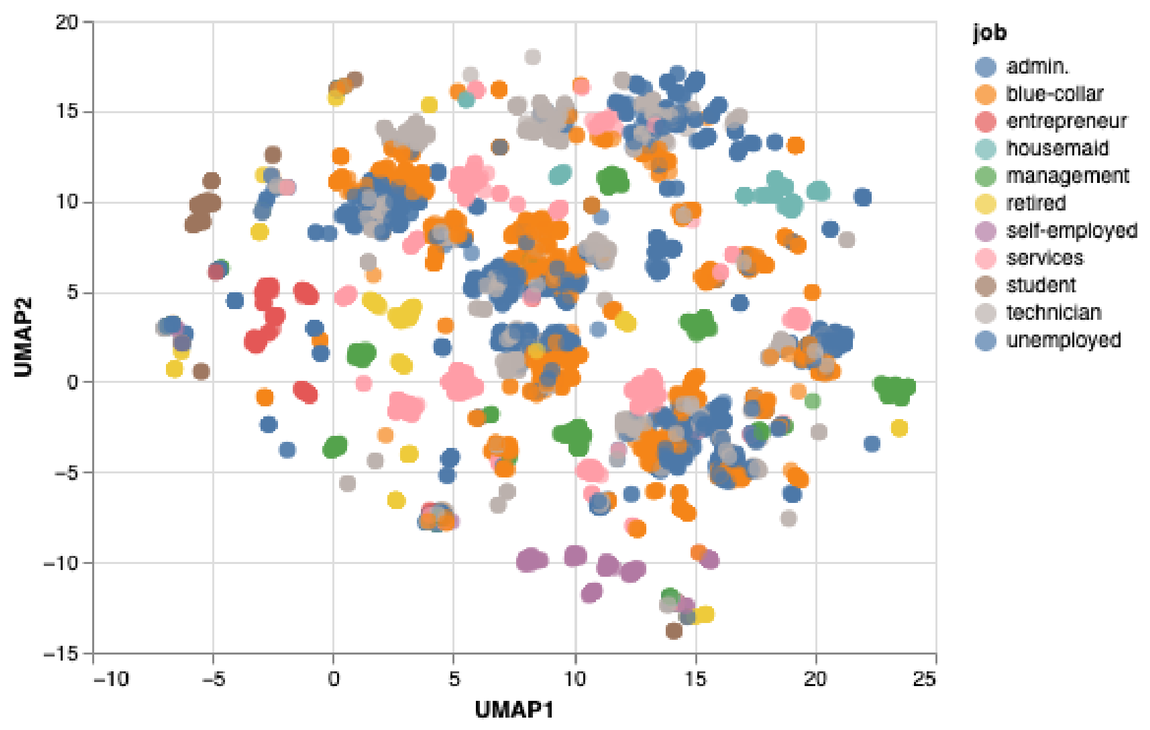


Fig. 1: UMAP of clustering colored by jobs

General findings of the UML

- Clusters with a higher duration had a higher yes-no ration
- Administration clusters have the higher count
  - *Fig.1*: Inconclusive clustering

Supervised Machine Learning

The AUC score of the RF model assigns larger probabilities to random positive examples than random negatives

Model	AUC Score
Logistic model including L1 and L2 penalities	0.6187
Elastic Net model	0.5000
XGBoost model	0.6356
Random Forest model	0.7705

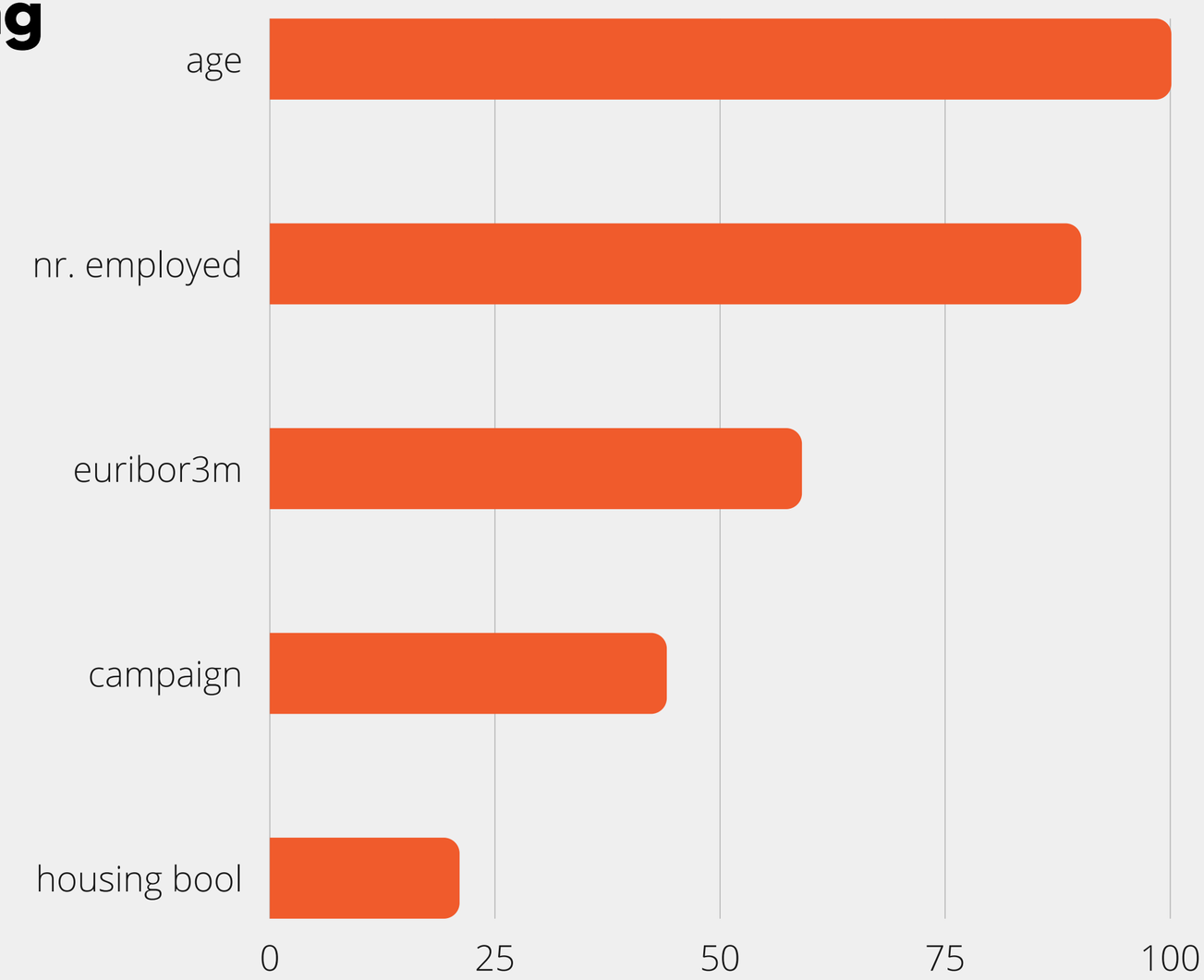


Fig. 2: Features importance of 5 most important features using RandomForestRegressor

Conclusion & Improvements

The prediction model is a useful when evaluating future marketing campaigns or predicting the rate of succes when calling potential new customers

UML

Many overlaps in the clusters, but no clear indications. However, the clusters with the higher durations also had a higher y/n ratio.

SML

Successfully, developed a model that computes the probability of how likely a client with certain features in a given setting will respond to amarketing campaign. RF performs best. The client's age is a feature to be taken into account when predicting the outcome of a marketing campaign. Moreover, external facors are important.

Improvements

The project could have improved by: exploration of under- and overfitting, Hyperparameter tuning, dealing with the imbalanced data e.g. resampling.