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Bertelsmann/Arvato Customer Segmentation & Data Driven Marketing

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Domain Background

This project combines unsupervised and supervised machine learning on structured data to enable data driven marketing.

Problem Statement

This project will aim to identify the most likely customer acquisition prospects for a German mail order company by analyzing what portion of the general population most resembles the existing customer base. In a second step we then hope to predict individual customer responses to the marketing campaign.

Datasets and Inputs

The data for this project has been provided by Bertelsmann/Arvato in the form of csv files, which we will need to clean and preprocess. This includes data gained through market research about the general population and the existing customer base, as well as labeled data of customer responses to the marketing campaign and an unlabeled test set.

Solution Statement

K-means clustering appears to be the most logical approach for population segmentation since we are looking for a subgroup of the population that is most similar to the existing customer base. XGBoost has performed well on the supervised learning portion of this project in the past. We will compare it to Climbs Rocks's AutoML performance.

Benchmark Model

The unsupervised model should show us a population segmentation where the vast majority of the existing customer base belongs to a few clusters of the general population.

We will compare the performance of our supervised models by submitting them to the existing kaggle competition and see how they measure up. As of this writing the top performing models on the leaderboard come in above 0.8 on the AUC metric. The score to beat is 0.80819.

Evaluation Metrics

As mentioned above the evaluation metric for the Kaggle competition is AUR, and will thus be the metric we employ. Accuracy would not deliver good results since the input data is highly asymmetric.

Project Design

This project will have four stages. First the data for the unsupervised learning tasks will have to be cleaned and then segmented using k-means clustering. We may have to iterate over several versions with different numbers of clusters and selected features.

We will fit a basic XGBCLassifier as our baseline for the supervised learning task. Afterwards we will run ClimbsRocks/auto_ml to automatically select and tune a predictor. Our goal is to create a model that can compete with the current top performing models in the Kaggle competition, with minimal effort, that means beating the 0.8 AUC.