

# Carvago / Pricing

## Overview

*Carvago aims to simplify purchases and transfers of used cars. To do this, Carvago researches used car listings in a number of European countries. The discovered advertisements are downloaded and collected on Carvago's*

*website and presented to potential buyers. Carvago aims to provide the end customer with an indication of how the selected car compares to similar cars. In addition, Carvago offers car valuation to its industrial partners.*



## Situation

Carvago used the XGBoost model, with a subset of car equipment to estimate the price.

## Solution

After exploring various options, we settled with CatBoost, a boosting ensemble model based on a sequence of decision trees. CatBoost offers good accuracy and good performance. In addition, we can explore the final model and postprocess the results to extract the required data.

Plain output from the model is accurate, but its results are not well received by human experts, especially when the predicted price goes against expert's expectation. In that case, the human expert needs to see peer cars they use to estimate the price themselves.

The final solution uses the CatBoost as "supervised" clustering algorithm. We try to drive similarly priced cars into similar leafs in the sub-models. Then we extract from the Catboost model the most similar cars and use them to derive the estimated price. Although this approach is less accurate, it is much better received and trusted by end users.

## Keywords

pricing  
regression models  
prediction certainty

## Requirements

To build an accurate pricing model. In addition, identify features with the strongest influence on the price, estimate confidence the model has in its prediction. Explore ways to explain the final decision in a way to be accepted by experts.

## Benefits and Results

**For the end user and industrial partners the benefit is more accurate pricing, which takes into account much more car equipment than the original solution.**

**In addition to be more accurate the proposed solution, based on modified technique, the solution is much better accepted by human industrial experts.**