

# LIGHTGBM ALGORITHM

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This code uses the **LightGBM algorithm** to train a regression model on the provided dataset and make predictions on the test set. LightGBM is a gradient boosting ensemble method that is used by the Train Using AutoML tool and is based on decision trees. As with other decision tree-based methods, LightGBM can be used for both classification and regression. LightGBM is optimized for high performance with distributed systems.

- The required libraries are imported: pandas, LightGBM, and mean\_absolute\_percentage\_error from sklearn.metrics. The train and test datasets are loaded into Pandas dataframes.
- The train and test dataframes are concatenated into a single dataframe. Any missing values in the combined dataframe are replaced with 0.
- The features and target variables are selected from the train and test dataframes. The LightGBM regression model is created with the default hyperparameters.
- The model is trained on the training data using the fit() method. The model is used to make predictions on the test data using the predict() method.
- The mean absolute percentage error (MAPE) is calculated using the mean\_absolute\_percentage\_error() function from the sklearn.metrics library.
- The MAPE is converted to a score out of 100 and printed to the console.
- A submission dataframe is created with the predicted target values and product IDs. The product IDs are set as the index of the submission dataframe. The submission dataframe is saved as a CSV file.

The only feature used is PRODUCT\_TYPE\_ID. Additionally, no hyperparameter tuning is performed for the LightGBM model.