MLxtend: A Library with Interesting Tools for Data Science Tasks

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Read the article on https://www.ealizadeh.com/blog/mlxtend-library-for-data-science/

Introduction

MLxtend library [1] (Machine Learning extensions) has many interesting functions for everyday data analysis and machine learning tasks. It is a valuable addition to your data science toolbox.

MLxtend Library

MLxtend library [1] is developed by Sebastian Raschka (https://sebastianraschka.com/). You can install the library through PyPi by running

```
pip install mlxtend
```

Keywords

• Python Library • Machine Learning • Data Science • Classification

Bias-Variance Decomposition

API: `from mlxtend.evaluate import bias_variance_decomp`

The bias-variance decomposition can be used to analyze bias-variance tradeoff in certain problems by decomposing the generalization error into a sum of 1) bias, 2) variance, and 3) irreducible error [2].

Bootstrapping

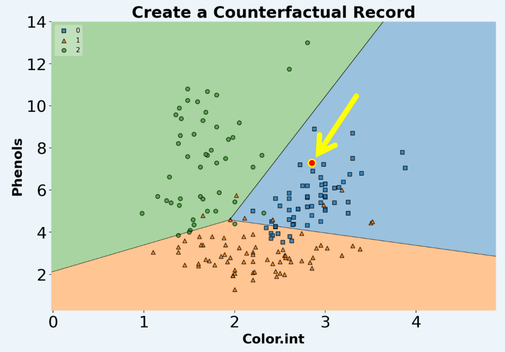
API: `from mlxtend.evaluate import bootstrap`

The bootstrap is an easy way to estimate a sample statistic and generate the corresponding confidence interval by drawing random samples with replacement.
You can also pass a custom statistic to the bootstrap function through the argument `func`. The custom function must return a scalar value.

Create Counterfactual

API: `from mlxtend.evaluate import create_counterfactual`

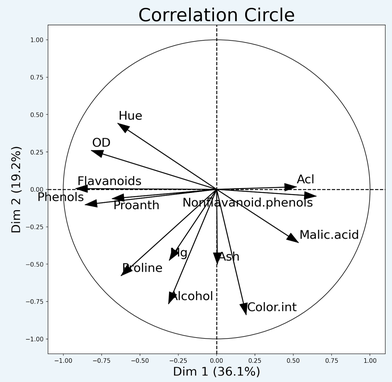
Creating counterfactual records is useful for model interpretability, and can be done by modifying the features of some records from the training set in order to change the model prediction [3].



PCA Correlation Circle

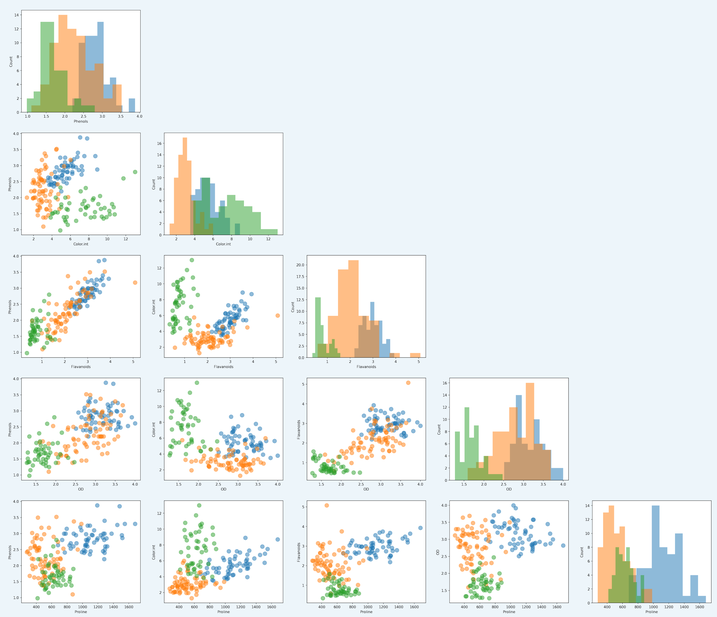
API: `from mlxtend.plotting import plot_pca_correlation_graph`

Compute the correlation between features and the PCs (principal components).



Matrix of Scatter Plots

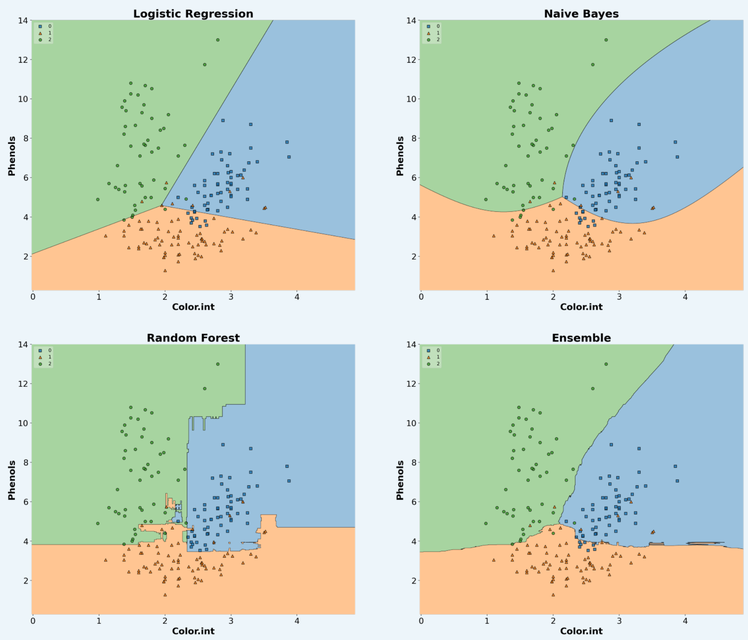
API: `from mlxtend.plotting import scatterplotmatrix`



Decision Regions

API: `from mlxtend.plotting import plot_decision_regions`

Draw a classifier's decision regions in 1 or 2 dimensions.



References

[1] Sebastian Raschka. Mlxtend website. https://rasbt.github.io/mlxtend/. Accessed: 2020-12-29.

[2] S. Raschka. Bias-variance decomposition. http://bit.ly/mlxtend-bias-variance-decomp. Accessed: 2020-12-29.

[3] S. Raschka. Create counterfactual. http://bit.ly/mlxtend-counterfactual. Accessed: 2020-12-29.