Lab assignment 1: Classification

# Scope and objectives

The objective of this project is to analyze the impact of several numerical variables on the performance of homeowners at repaying their credit in 12-36 months.

Our goal is to compare the performance of different classification models to find the optimal algorithm to predict the outcome of our output variable.

Inside this document we will firstly do a exploration of the data and preprocessing, and then we will perform a logistic regression analysis, a kNN model, a decision tree, a SVM and a MLP model. Finally these models will be compared against each other using different metrics.

Document format

\*Maximum score\*

0.5

The document is well written, with sections diving the content, figures are enumerated with references in the text and commented.

* • Writing the report in an adequate format
* • Figures enumerated
* • Figures referenced
* • Correct spelling
* • Constant font styles
* • Others
* • Overall effort in the report

Exploratory Data Analysis and Preprocessing

\*Maximum score\*

1.5

The different preprocessing steps are followed.

Logistic Regression model identification

\*Maximum score\*

1.0

kNN model identification

\*Maximum score\*

0.5

Decision Tree model identification

\*Maximum score\*

1.0

SVM model identification

\*Maximum score\*

0.5

MLP model identification

\*Maximum score\*

1.0

Comparative analysis of models

\*Maximum score\*

1.5 The comparison should be summarized in the form of a table including different performance measures on cross-validation, training and test sets.

A critical analysis of the results and the inclusion of plots for comparing the performance of the models will be considered.

Creativity and innovation

\*Maximum score\*

2

In this section you should look for resources on the internet that are applicable to this assignment and were not taught in class. These resources can be concepts,

techniques, packages, etc... that are applicable in this exercise. For example, you could use packages that aid in dataset exploration or classification model analysis.

Extra effort on the other sections would also be considered in this section.

* • New concept - 0.5
* • New concept + explanation - 1.0
* • New model - 0.5
* • New model + explanation - 1.0

Conclusions

\*Maximum score\*

0.5

A conclusion section should be included in which the selection of the best model for the application is justified.

IMPORTANT INFORMATION

-> The selection of model hyperparameters shall be justified

-> Variable selection shall be performed when inherent methods to identify relevant variables are available for the model