SAS® Enterprise Miner™ vs. Scikit-Learn – How do they recommend me good songs?

Raphael Lima

Abstract

Making good recommendations are essential for the retail and wholesale markets, and in many cases these suggestions become a competitive differential when aligned with marketing and sales campaigns. Empowered by those market trends big companies like Netflix in their streaming platform, or giants like Amazon and Airbnb are working hard to improve their recommendations always seeking for customer satisfaction.

A Recommender System (RS) is a software with models that provide items suggestions for its user appreciation, like thousands of Spotify® subscribers, we are used to get a good custom playlist recommendation every week, but every song wrongly recommended, makes us wonder how to make better suggestions, so we decided to consume our data from Spotify API and recommend our own songs. In this scenario, we will develop two Recommender Systems, first one using SAS® Enterprise Miner and another one using Python-Scikit-Learn, and evaluate the accuracy of both modelling tools, and the results were amazing!
We decided to compare SAS Enterprise Miner and Python Scikit-learn as they are excellent modeling tools widely used in Data Science and Statistics fields. We keep up with the growing expansion of open source tools in novice programmers, while the SAS tool, specifically SAS® Enterprise Miner, has traditionally been used in the industry by professionals with a broader market experience. However, besides being an open source tool, what advantages does Python have compared to SAS in decision model building?
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Data

- Target=1
- Target=0

Source

Build experiences for millions of music lovers with playback, personalization, and much, much more.

Features

- Acousticness
- Valence
- Duration
- Energy
- Loudness
- Speechiness
- Tempo
- Instrumentalness
- Danceability
- Key
- Liveness

Abstract

Introduction

Methods

Results

Conclusion

Content Based Recommender System (RS)
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SAS Enterprise Miner - Flux

Model Comparison

Receiver Operating Characteristic

Model Comparison
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Accuracy Score

SAS® Enterprise Miner™ proved superior to Scikit Learn in Accuracy Score (Lower Misclassification Rate) when we used the default configuration of its in comparison to default configuration of Scikit Learn Library.
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Default Comparison (Documentation)

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No Penalty

Depth: 2

Maximum number of trees: 100

T.Criterion: Chi Square

Hidden Layer Size: 3

Kernel: linear

Parenting Method

Logistic Regression

Gradient Boosting

Random Forest

D. Tree

Neural Net

SVM

Naive Bayes

Ridge Penalty

Depth: 3

Number of estimators: 10

T.Criterion: GINI

Hidden Layer Size: 100

Kernel: rbf

Priors = None

Standard Scaler Required

Embeded Variables Standardization

No Penalty

Depth: 2

Maximum number of trees: 100

T.Criterion: Chi Square

Hidden Layer Size: 3

Kernel: linear

Parenting Method

Logistic Regression

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In this case study, comparing classification methods, we concluded that with SAS Enterprise Miner, it was possible to build models with higher accuracy and lower missclassification rate under validation sample than Scikit learn in python considering the default settings of each method in both solutions.

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References

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