PYTHON PREDICTIONS
A TOBANIA COMPANY

Introduction to Cobra

Predictive models focused on performance and interpretation

34th Data Science Leuven Meetup

Jan Beníšek, 2021/02/09

About

PYTHON PREDICTIONS
A TOBANIA COMPANY

TOBANIA

Since 2006

Data Science with Impact

Our mission

Being the most valuable data science business partner

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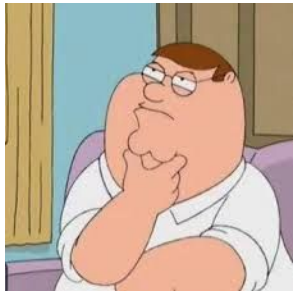
ARE YOU READY TO TAME THE COBRA?

WHAT?

Cobra allows you to **quickly** build **interpretable** models with high **predictive power**.

Why Cobra?

Cobra makes interpretable models equally accessible as black box models.



Coverage

Most projects are some form of binary classification

Automation

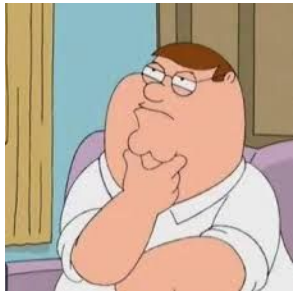
Quick model building leaves more time for exploration

Availability

Rapid and robust model building becomes available for many clients

Why open-sourcing Cobra?

We want to give back to the community and be transparent.



Community

Sharing is caring

Giving back is important to us

Growing together

Transparency

Towards clients

Job candidates understand what we do

How does Cobra work?

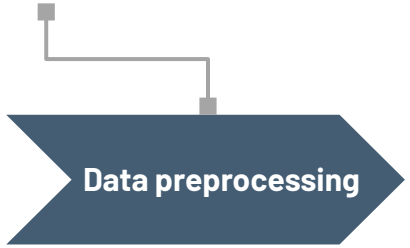
Cobra works by combining our business expertise in model building with the latest Python Data Science libraries.

pandas scikit learn

How does Cobra work?

Preprocessing is the core of Cobra and its interpretability...

- Train/selection/validation split
- Binning continuous variables into intervals
- Replace missing values
- Regroup categorical variables
- Target encoder of bins/categories



How does Cobra work?

...and Predictor Insights Graphs (PIGs) the main tool to open the box.

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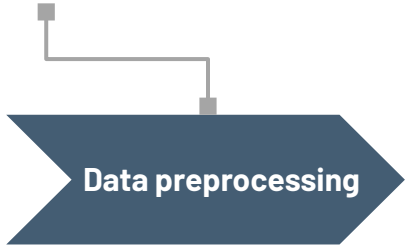

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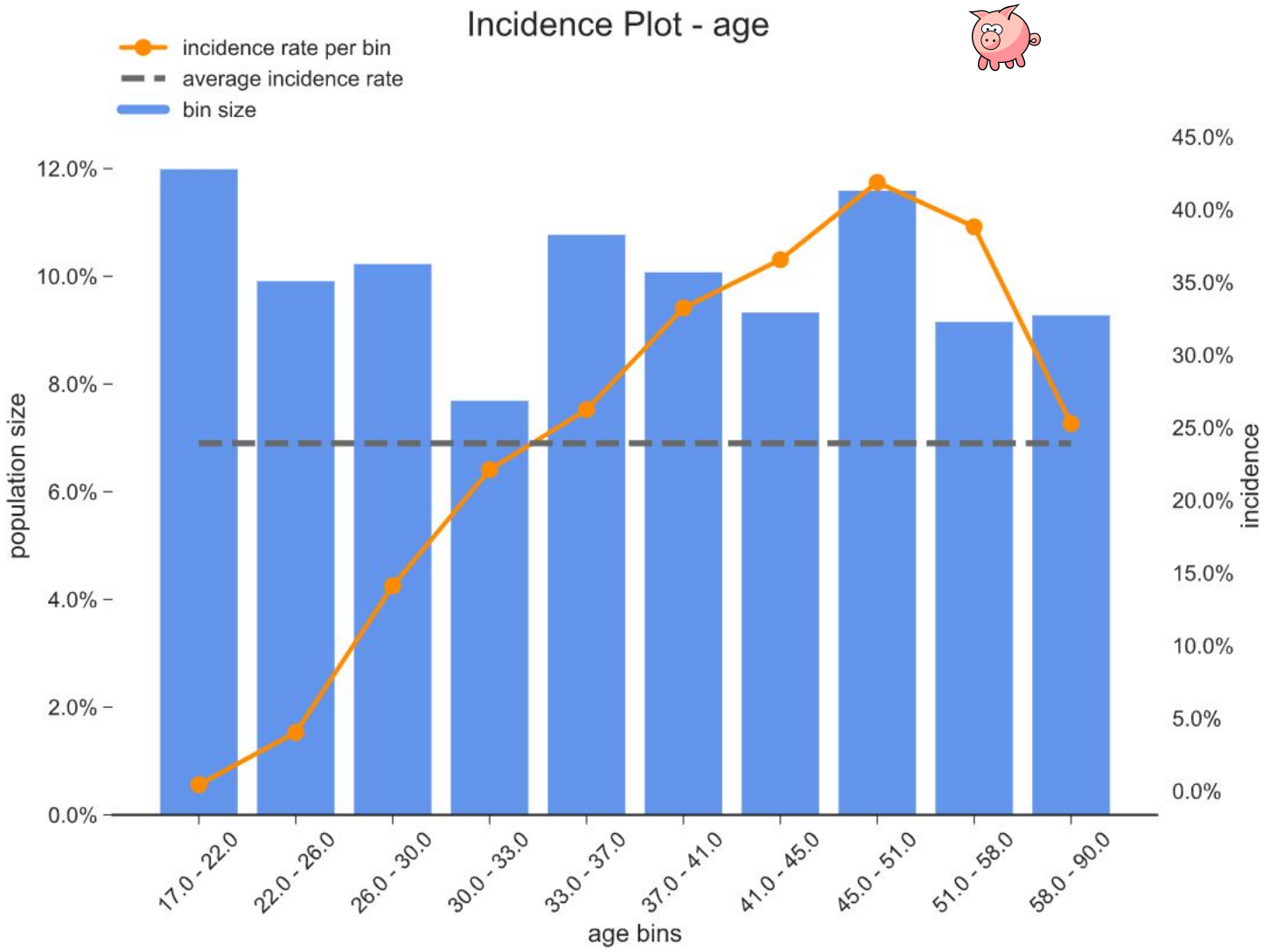

How does Cobra work?

We select only strong features and drop those which overfit.

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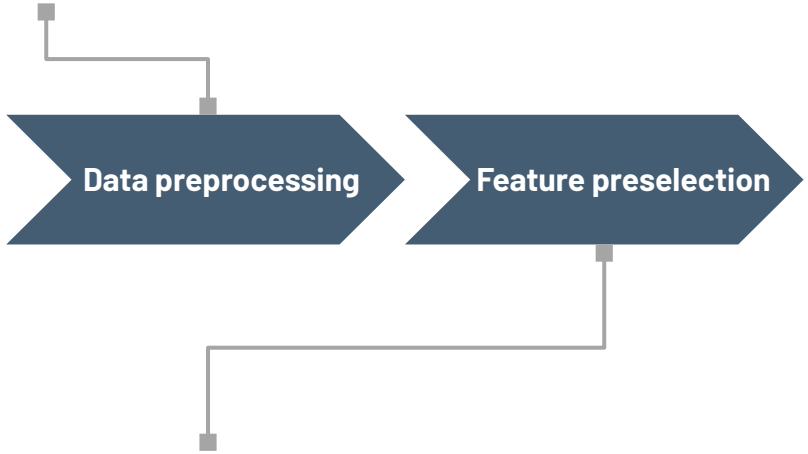

- Univariate preselection based on AUC
- Correlations & feature importance

How does Cobra work?

Logistic regressions with forward feature selection.

- Train/selection/validation split
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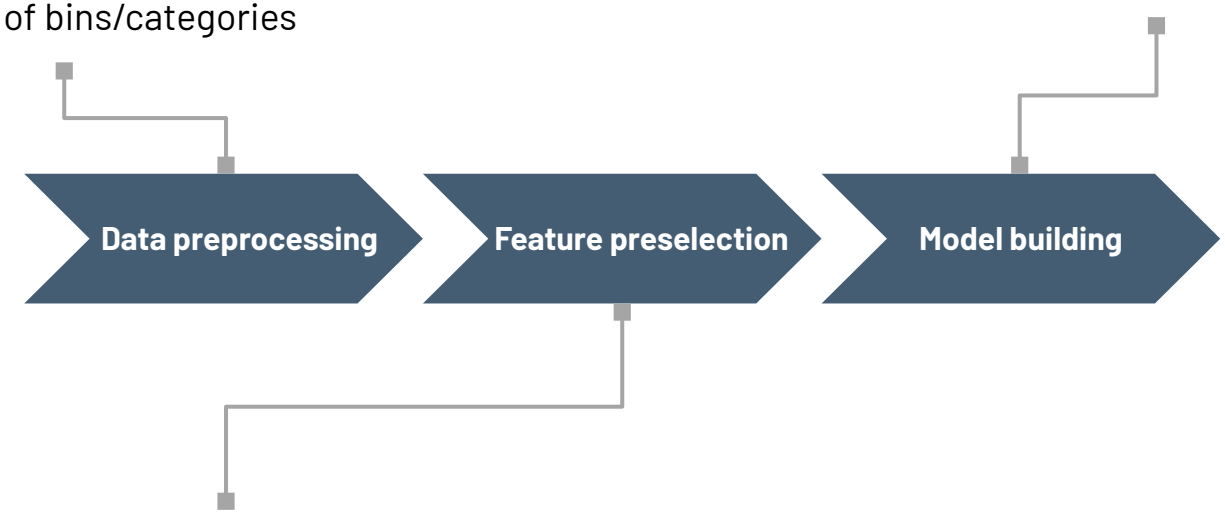

- Univariate preselection based on AUC
- Correlations & feature importance

- Forward feature selection
- Multiple logit models are built
- Comparison of models
- Feature importance plots

How does Cobra work?

Scalar metrics and plots let us see how the model performs.

- Train/selection/validation split
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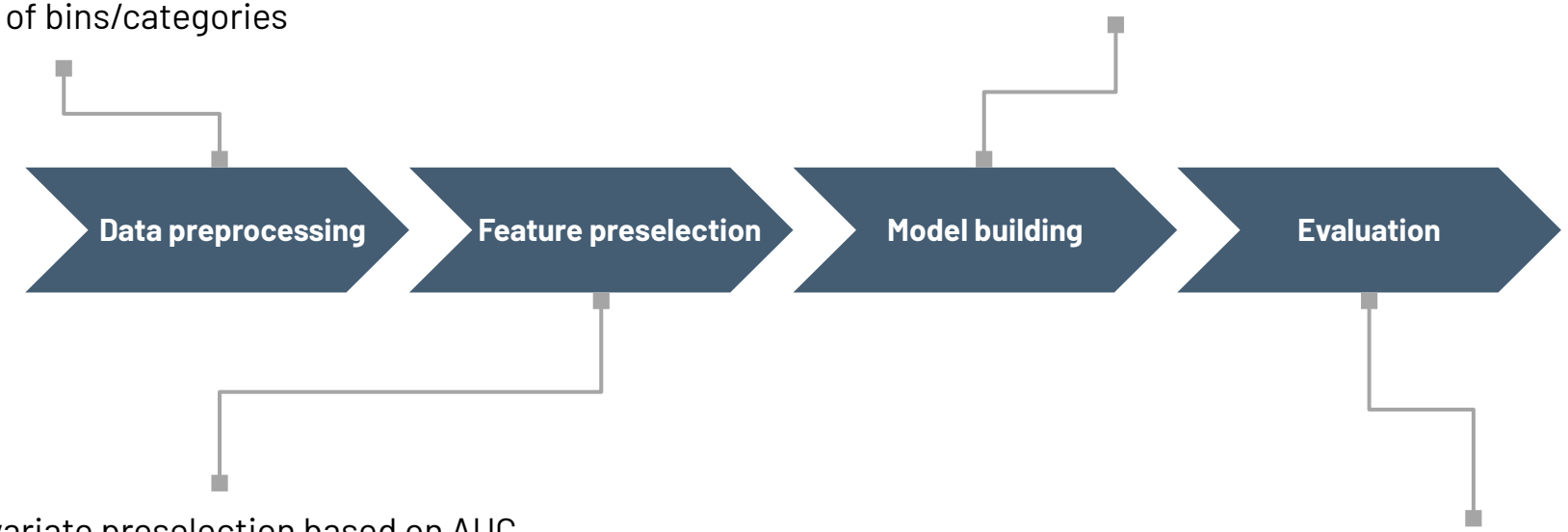
- Forward feature selection
- Multiple logit models are built
- Comparison of models
- Feature importance plots



- Univariate preselection based on AUC
- Correlations & feature importance

- Scalar metrics (accuracy, AUC, ...)
- Evaluation plots - ROC, Confusion matrix, lift, ...
- Predictor Incidence Graphs (PIGs) for understanding

Let’s get our hands dirty

GitHub repo

Thank you!

Questions?