HR ANALYTICS IN PYTHON: PREDICTING EMPLOYEE CHURN

Splitting the data

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Target and features

- target = churn
- features = everything else

Train/test split

- train - the component used to develop the model
- test - the component used to validate the model

```
from sklearn.model_selection import train_test_split

target_train, target_test, features_train, features_test =
                           train_test_split(target,features,test_size=0.25)
```

Overfitting

an error that occurs when model works well enough for the dataset it was developed on (train) but is not useful outside of it (test)

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Let's practice!

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Introduction to Decision Tree classification

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Classification in Python

Classification algorithms

- Logistic regression
- Support Vector Machines
- Neural Networks
- Other algorithms

Algorithm we will use

- Decision Tree

Decision Tree Classification

Splitting rule

Splitting rules:

- Gini: 2*p*(1-p)
- Entropy: -p*log(p) - (1-p)*log(1-p)

Decision Tree splitting: hypothetical example

Total set: 100 observations, 40 left, 60 stayed

- Gini: 2*0.4*0.6 = 0.48

Splitting rule: satisfaction > 0.8

- Left branch (YES) - 50 people: all stayed
- Gini: 2*1*0 = 0
- Right branch (NO) - 50 people: 40 left, 10 stayed
- Gini: 2*0.4*0.1 = 0.08

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Predicting employee churn using decision trees

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Decision Tree in Python

```
from sklearn.tree import DecisionTreeClassifier

model = DecisionTreeClassifier(random_state=42)

model.fit(features_train,target_train)

model.score(features_test,target_test)*100
```

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Interpretation of the decision tree

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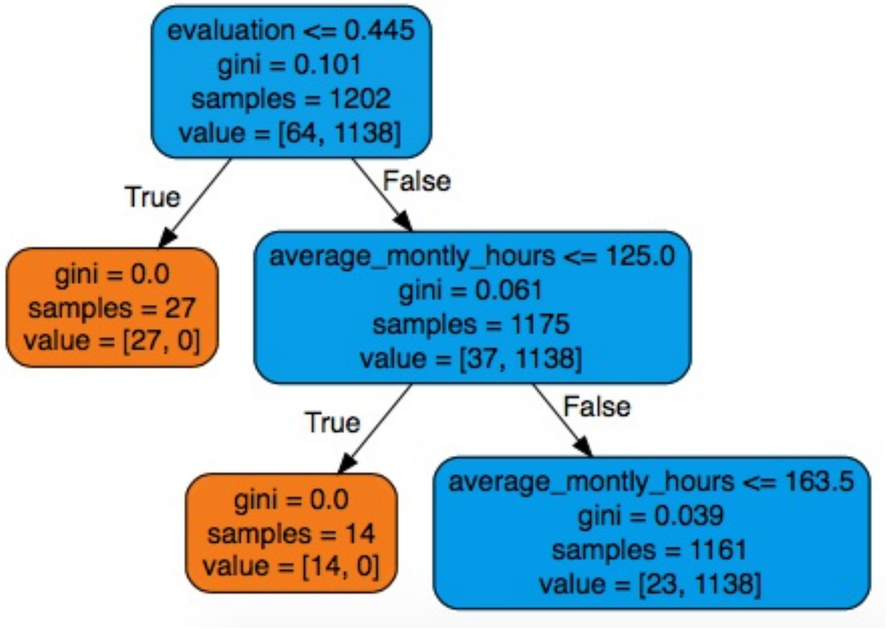
Visualization

1. Export
2. Copy content
3. Paste it in www.webgraphviz.com

Interpretation



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