



Decision Trees

Intro

Models we learned so far

Parametric vs. Non-parametric

Linear Regression

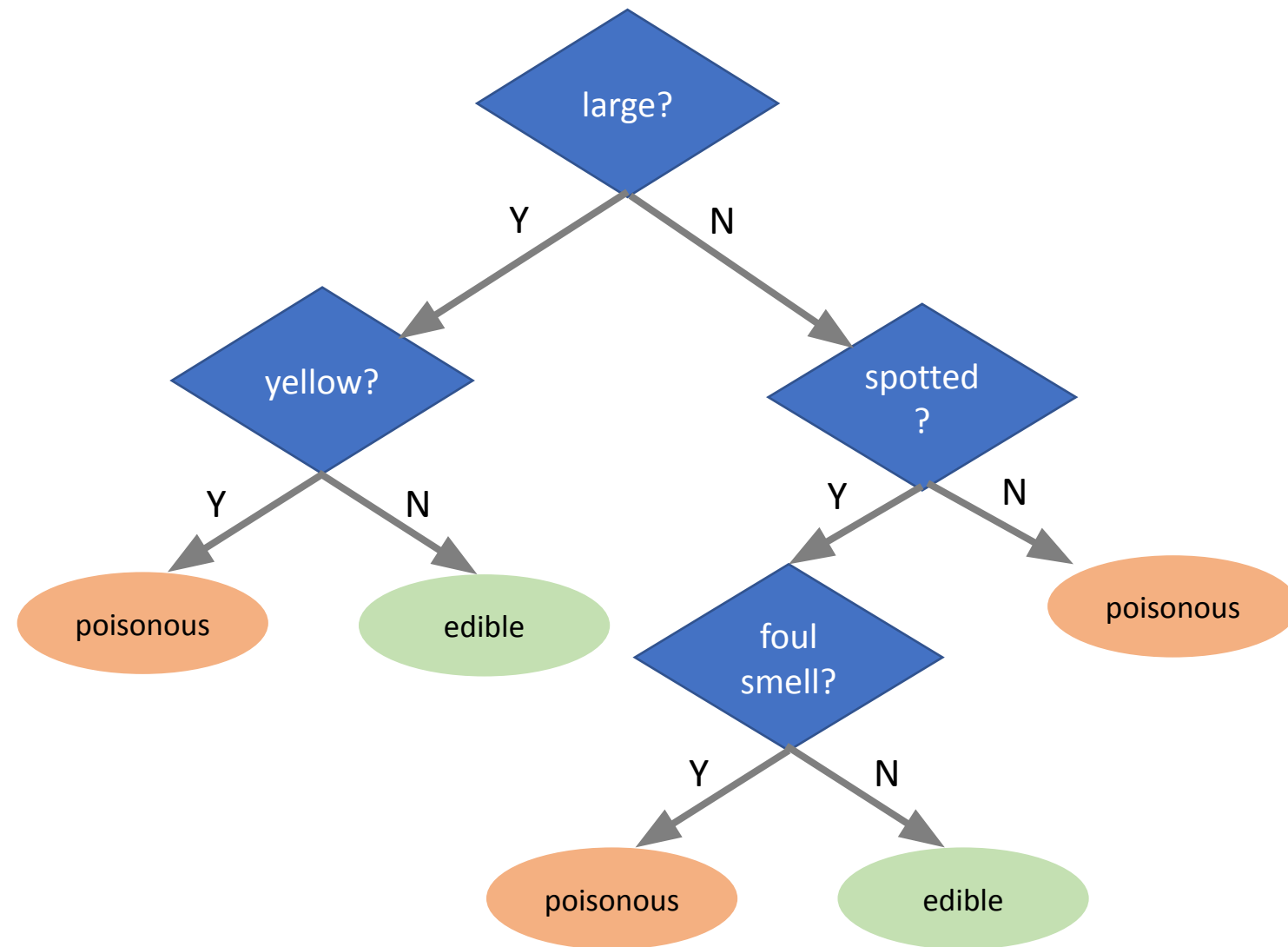
Logistic Regression

kNN

Parameters vs. Hyperparameters

Decision Tree

What is Decision Tree?

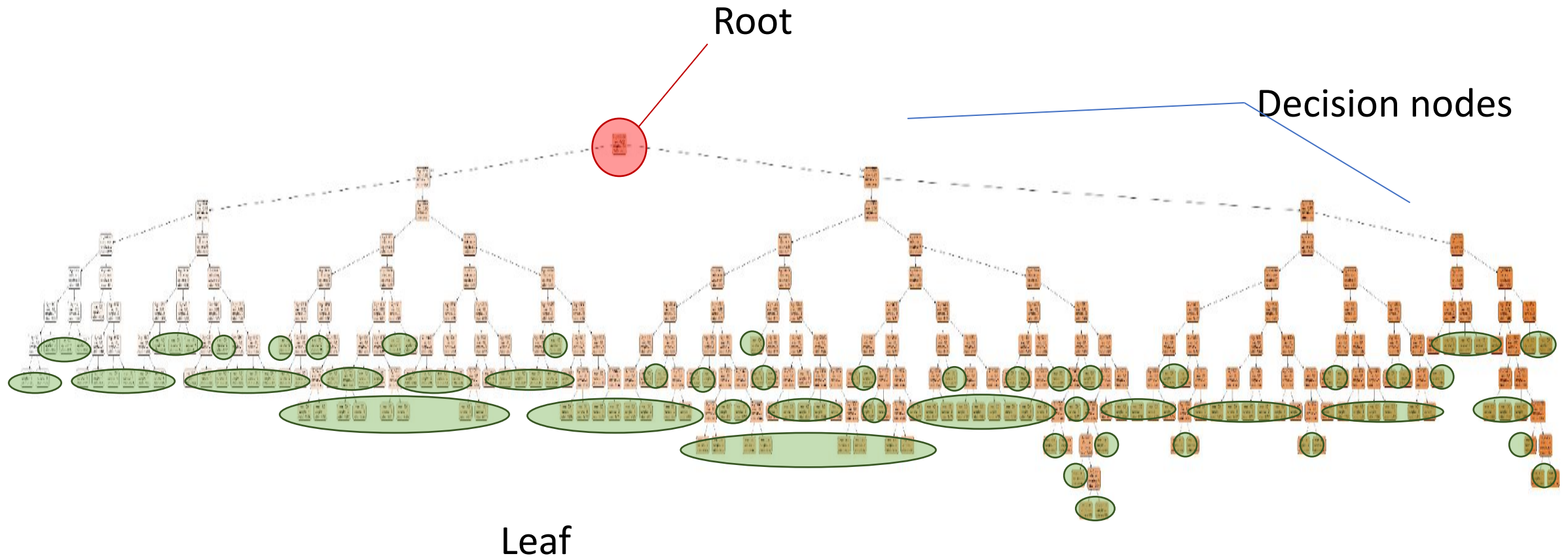


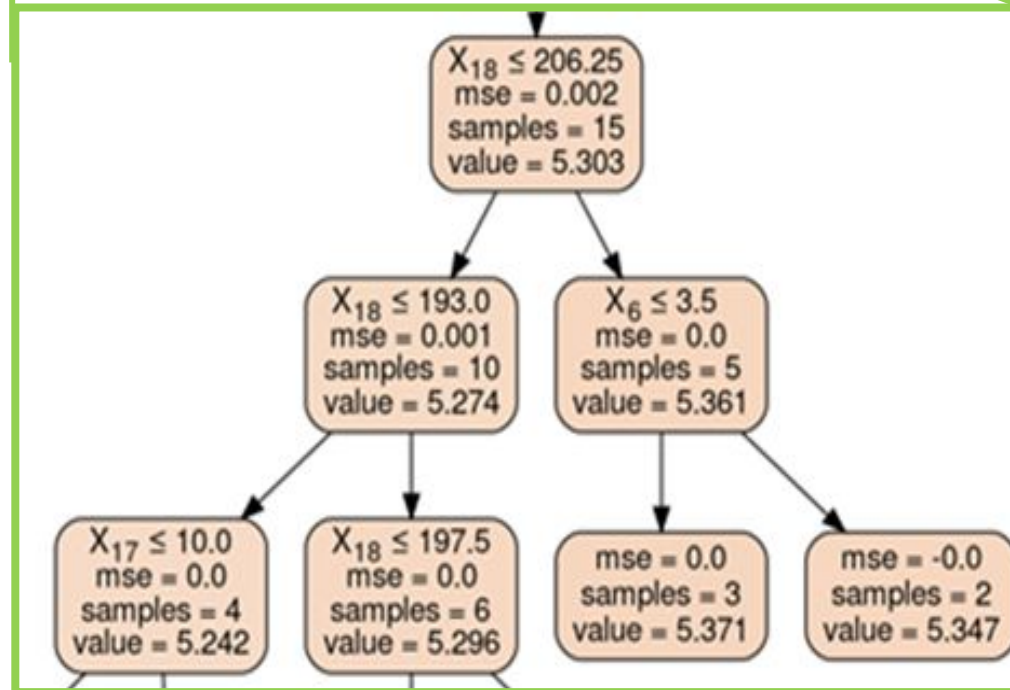
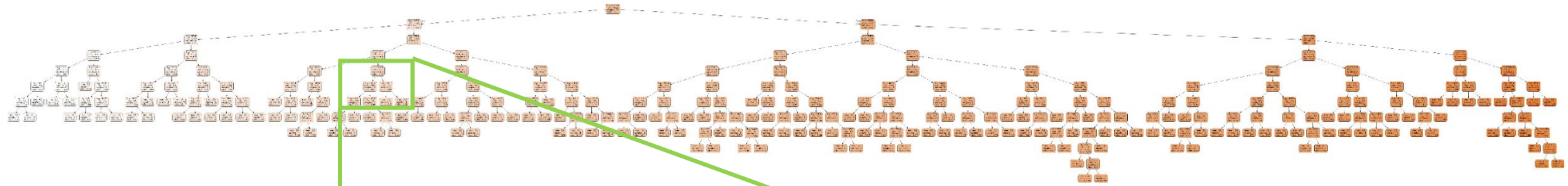
Caesar's mushroom



Death Cap

Decision Tree Nodes





How models “Learn” to make a Decision

Linear Regression

Minimize MSE

Logistic Regression

Minimize Cross Entropy

kNN

No optimization, but uses distance

Decision Tree

Split to minimize MSE for Regression task
and minimize
Cross Entropy or Gini for Classification task

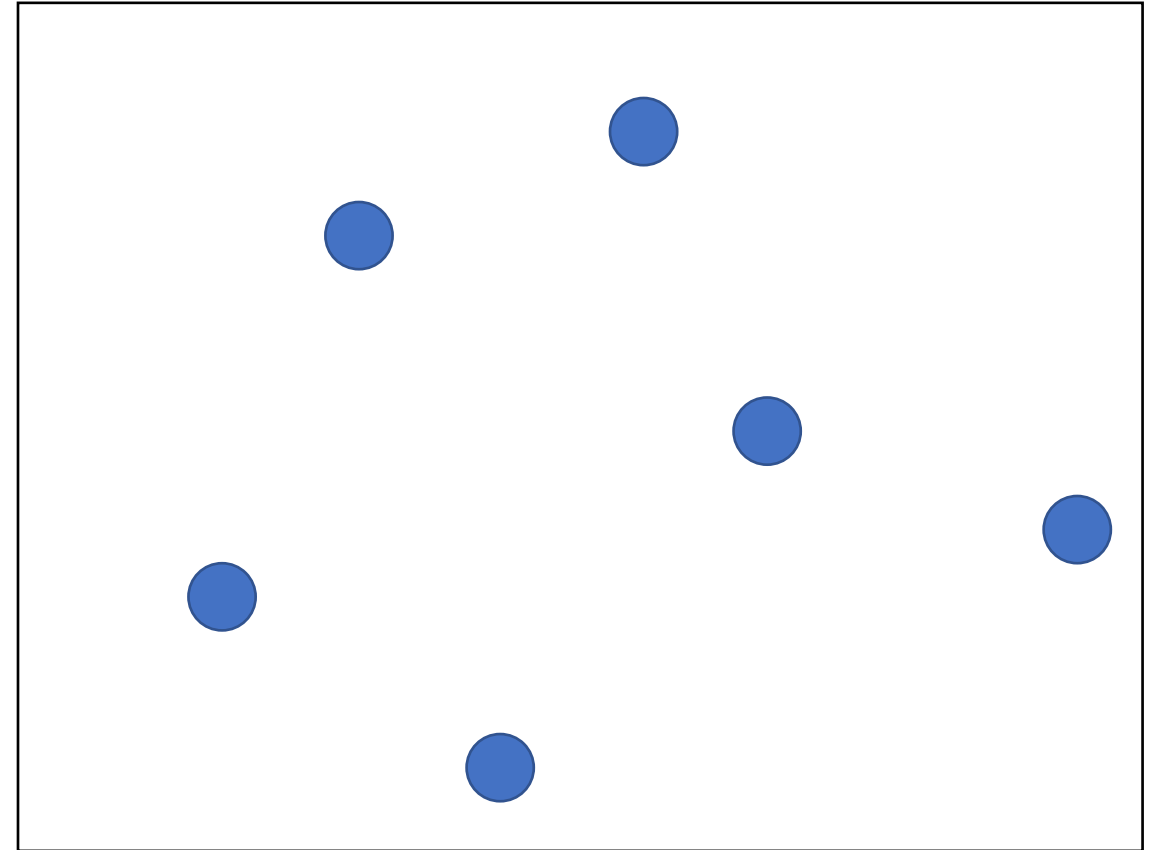
Decision Tree Regressor

The goal is to find boxes $R_1 \sim R_J$ such that

$$\sum_{j=1}^J \sum_{i \in R_j} (y_i - \hat{y}_{R_j})^2 \text{ is minimized.}$$

the mean of the data in
the box

x2



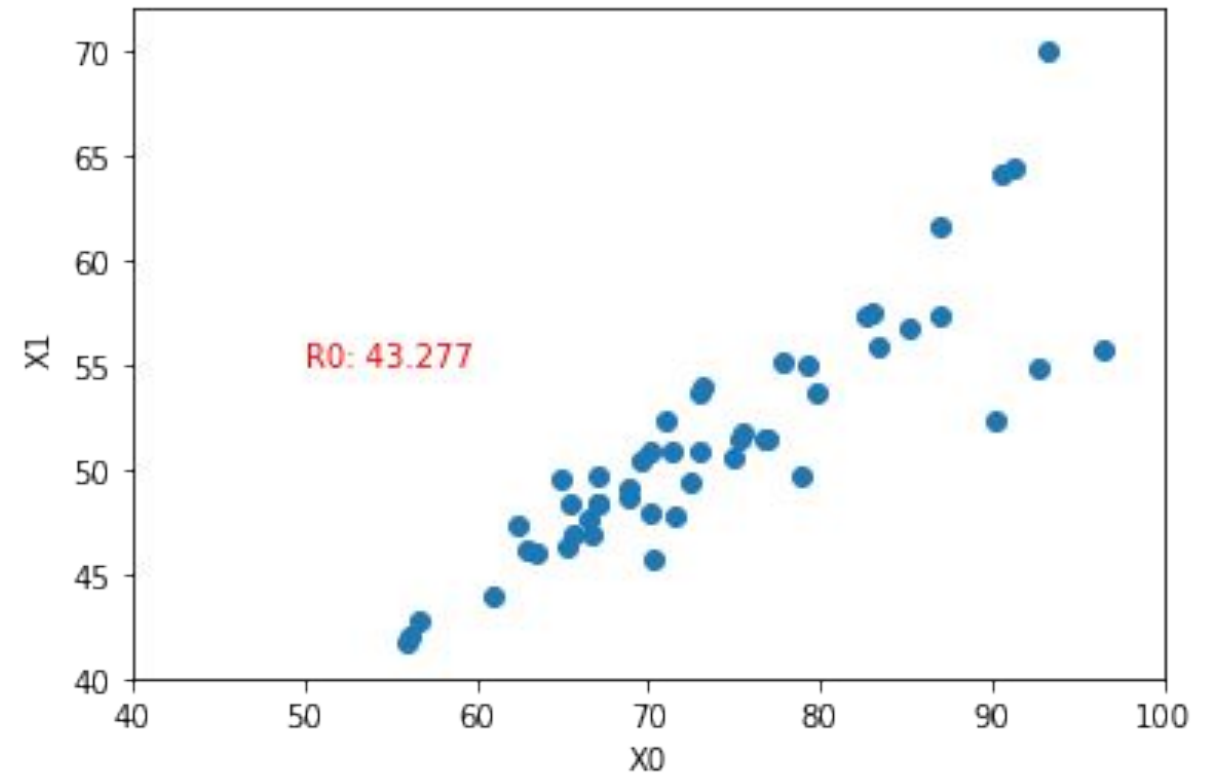
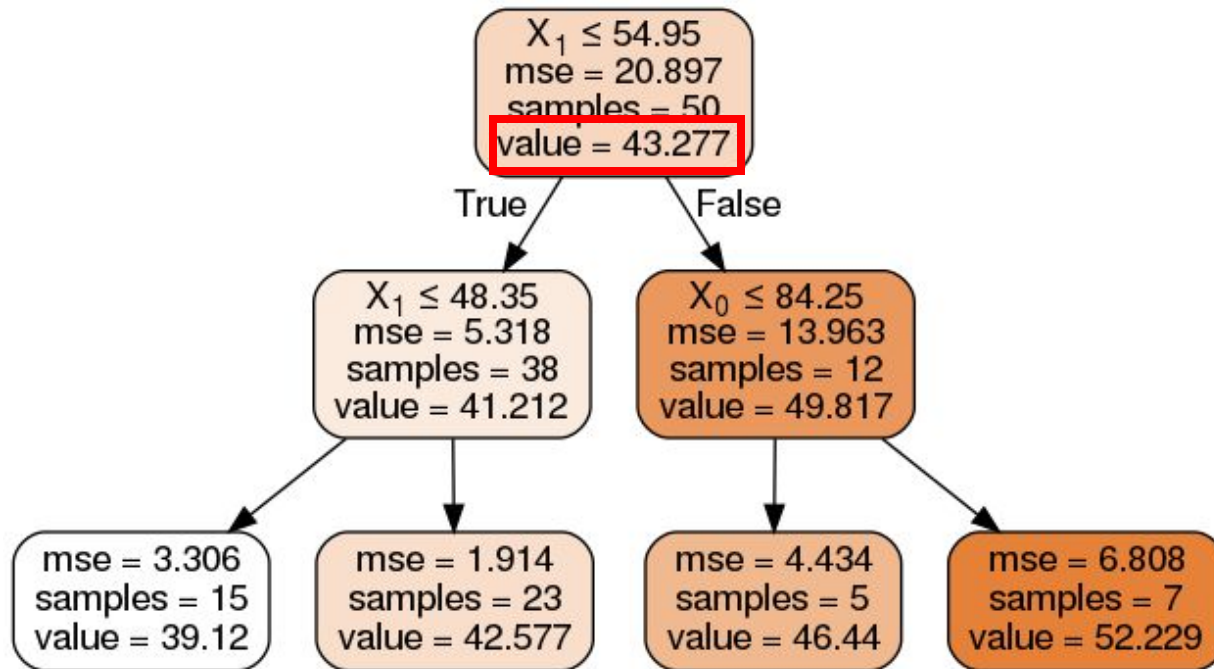
x1

Decision Tree Regressor

Faculty Salary Dataset

4 features

50 samples

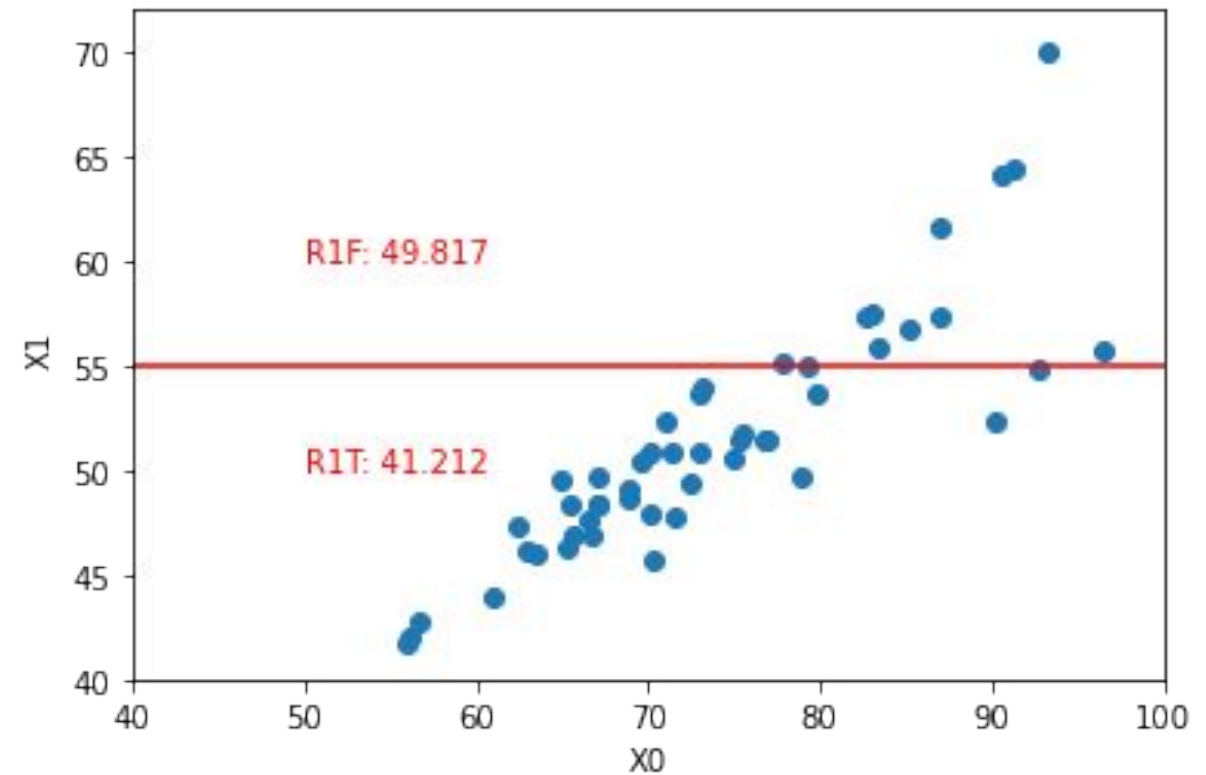
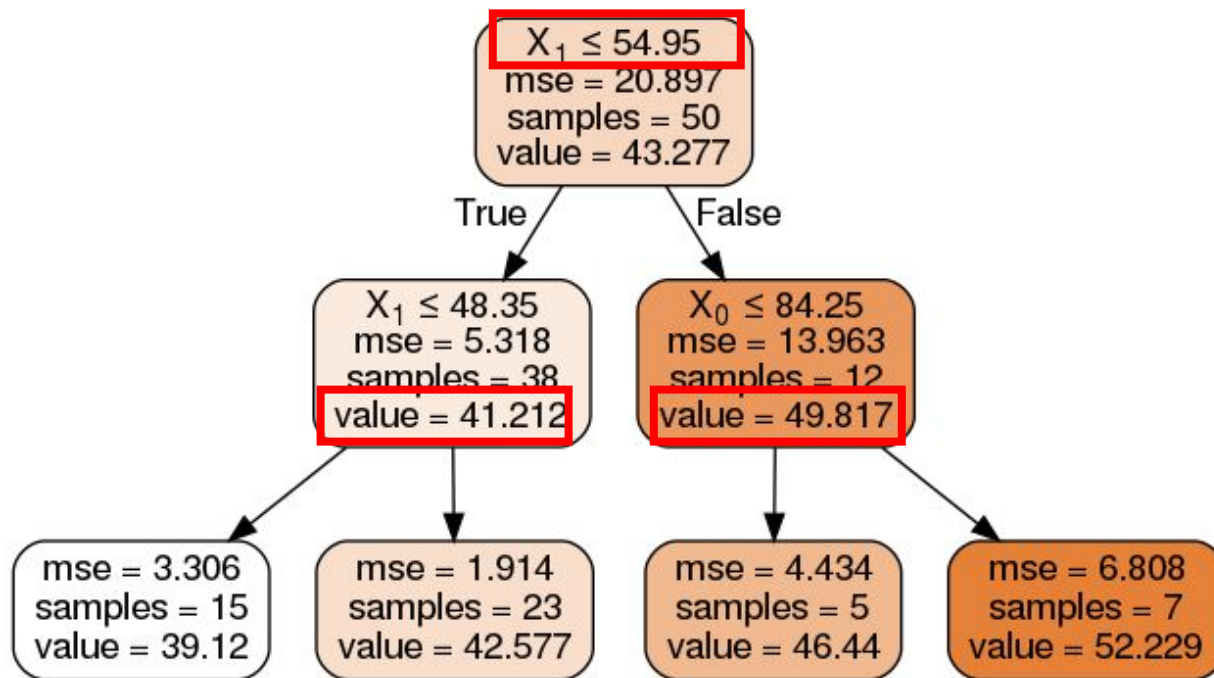


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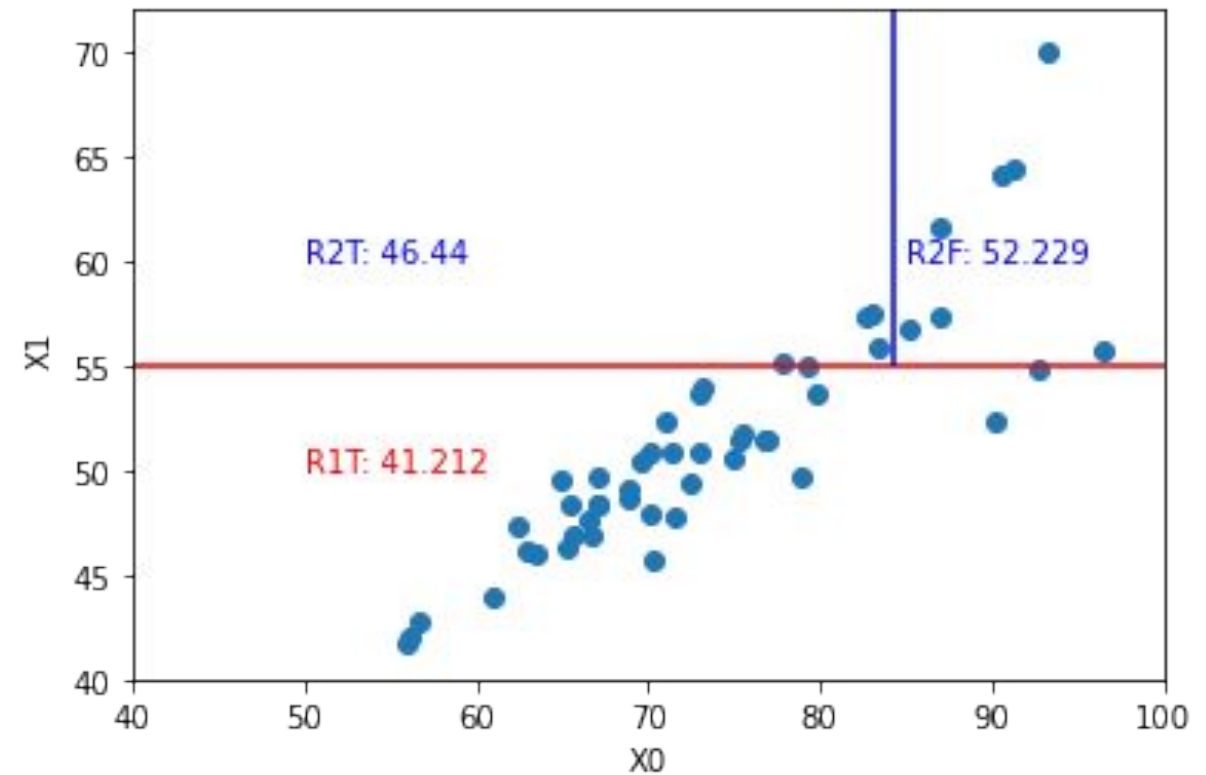
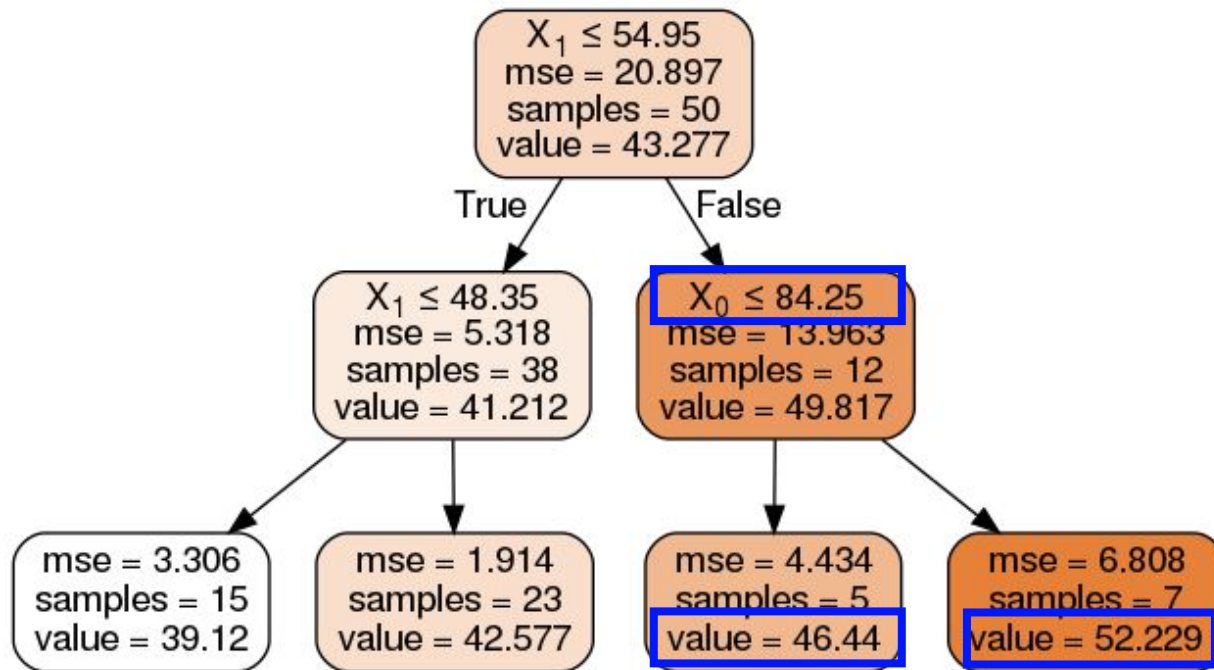


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