

# Hyperparameter Tuning for Regression Models

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# Overview

**Hyperparameter tuning support in  
scikit-learn**

**Hyperparameters of different  
regression models**

# Hyperparameters

Model configuration properties that define a model, and remain constant during the training of the model

# Hyperparameters

Part of the model design

# Understanding Hyperparameters

**Model Inputs**

**Model Parameters**

**Model  
Hyperparameters**

# Understanding Hyperparameters

## Model Inputs

Training data from  
which the model learns

## Model Parameters

## Model Hyperparameters

# Understanding Hyperparameters

## Model Inputs

Training data from  
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## Model Parameters

Model coefficient and  
intercept

## Model Hyperparameters

# Understanding Hyperparameters

## Model Inputs

Training data from  
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## Model Parameters

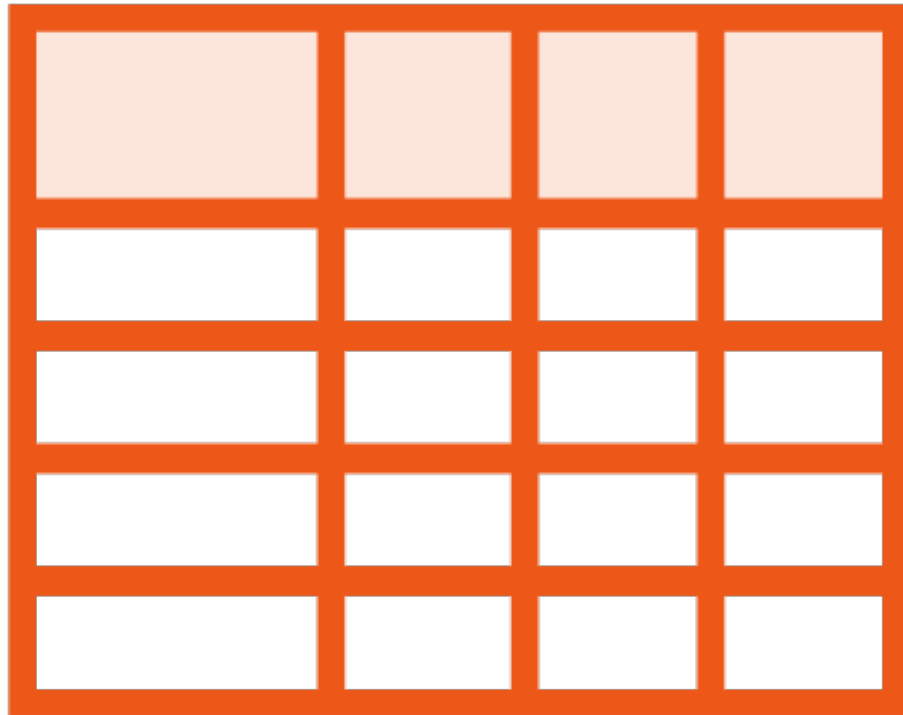
Model coefficient and  
intercept

## Model Hyperparameters

Depth of the decision  
tree, alpha for  
regularization



# Grid Search

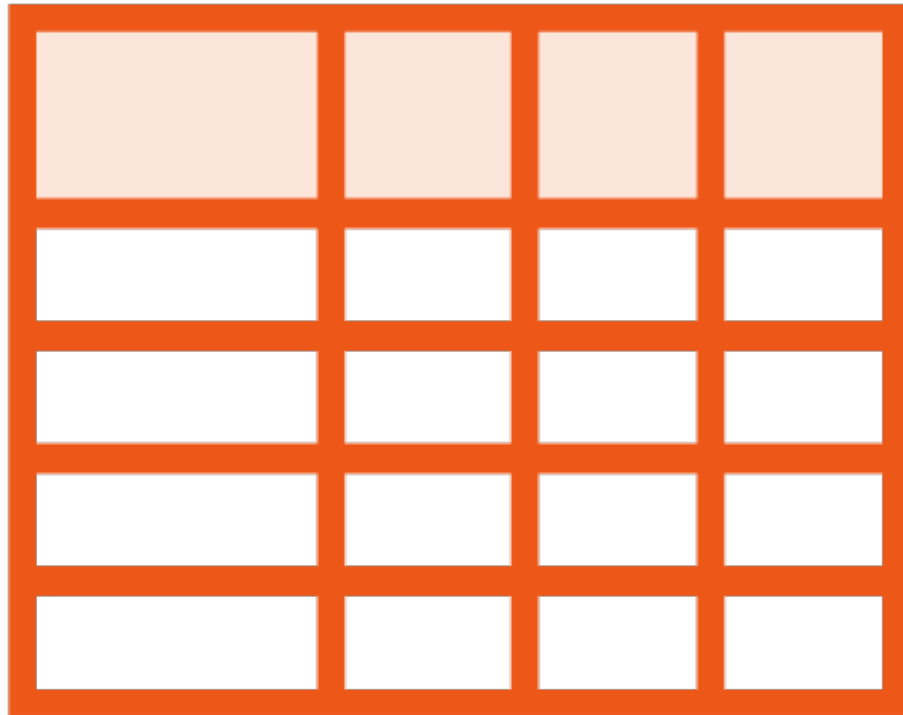


**Specify possible values for each hyperparameter**

**These values form a grid where each cell is a candidate model**

**GridSearchCV in scikit-learn to evaluate each candidate model**

# Grid Search



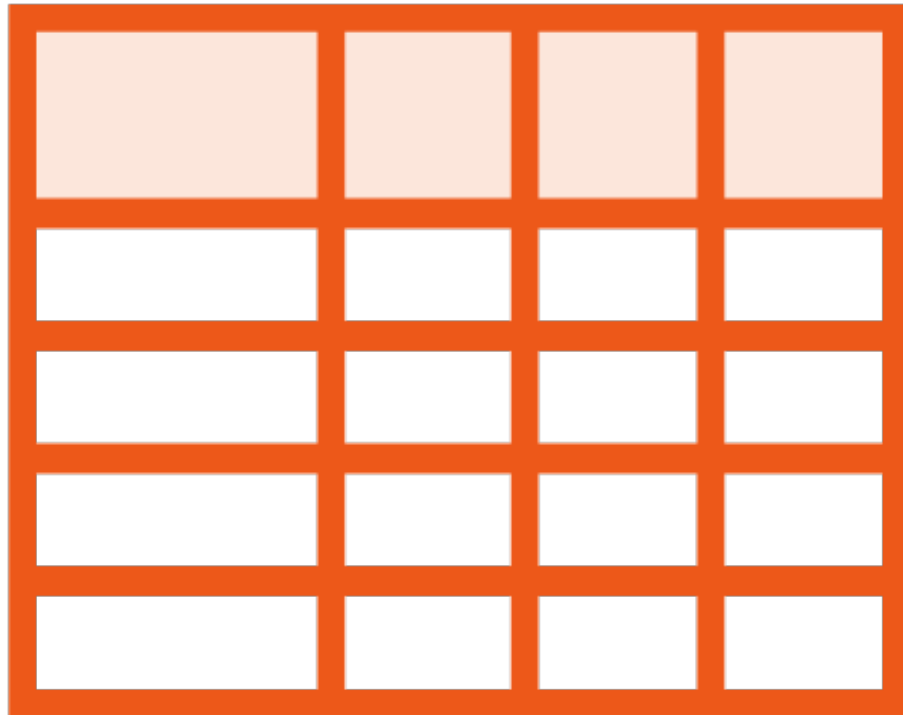
**Scikit-learn ensures proper evaluation and cross-validation**

**Very computationally expensive**

**2 hyperparameters, 3 values each**

**9 models to train and evaluate**

# Grid Search



**Cost and complexity of Grid Search can grow very quickly**

**Cloud-based evaluation can become very expensive**

**Also does not differentiate between important and trivial hyperparameters**

**Random search of hyperparameter space is an alternative**

Demo

**Hyperparameter tuning Lasso  
regression models using Grid Search**

# Demo

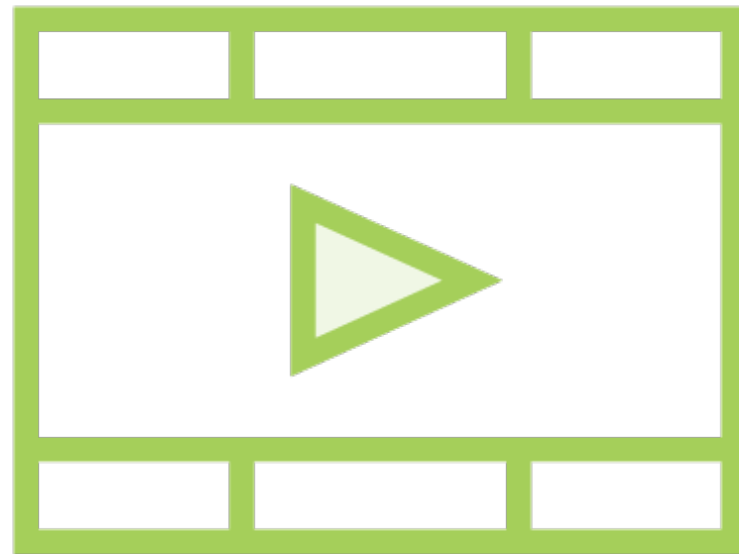
**Hyperparameter tuning on multiple  
different regression models**

# Summary

**Hyperparameter tuning support in  
scikit-learn**

**Hyperparameters of different  
regression models**

# Related Courses



**Building Classification Models with  
scikit-learn**

**Building Clustering Models with  
scikit-learn**