



ONLINE GRADIENT FOR LINEAR REGRESSION

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Goals and Requirements

Estimated time to complete lab is 10-15 minutes

Goals

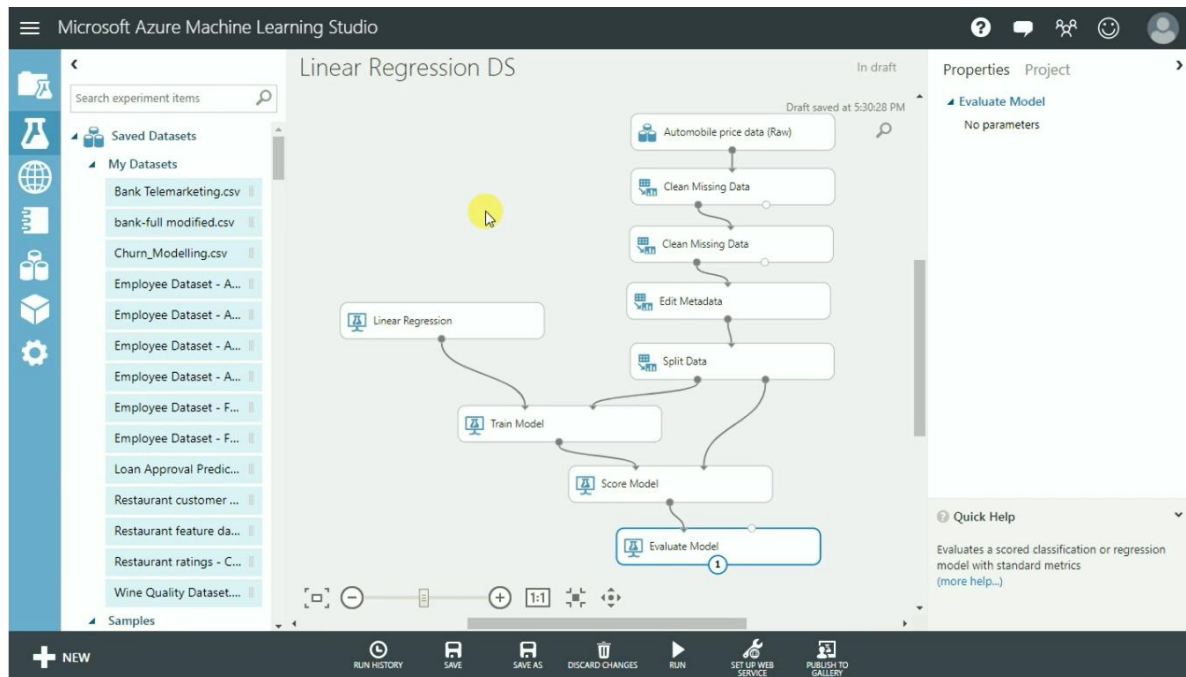
1. Implement and design a model for Predicting Vehicle Price using Gradient Descent.
2. Approach of using Linear Regression using Gradient Descent

Requirements:

1. Access to an Azure Machine Learning Studio

Online Gradient For Linear Regression

Copy previous example and place in canvas



Change solution method in linear regression as online gradient descent

The screenshot displays the Microsoft Azure Machine Learning Studio interface. The central workspace shows a workflow titled "Linear Regression DS" in draft status, saved at 5:30:28 PM. The workflow consists of the following steps: "Automobile price data (Raw)", "Clean Missing Data", "Edit Metadata", "Split Data", "Train Model", "Score Model", and "Evaluate Model". A "Linear Regression" node is also present, connected to the "Train Model" step. On the right, the "Properties" pane for the "Linear Regression" node is open. Under the "Solution method" dropdown, "Online Gradient Descent" is selected. Other parameters visible include "Learning rate" (0.025, 0.05, 0.1, 0.2), "Number of training epochs" (1, 10, 100), "L2 regularization weight" (0.001, 0.01, 0.1), and checkboxes for "Normalize features", "Average final hypothesis", and "Decrease learning rate". The left sidebar shows a list of datasets under "My Datasets", including "Bank Telemarketing.csv", "bank-full modified.csv", "Churn_Modelling.csv", and several "Employee Dataset" files. The bottom toolbar contains icons for "NEW", "RUN HISTORY", "SAVE", "SAVE AS", "DISCARD CHANGES", "RUN", "SET UP WEB SERVICE", and "PUBLISH TO GALLERY".

Change parameters as below

Properties

Project

Linear Regression

Solution method

Online Gradient Descent

Create trainer mode

Single Parameter

Learning rate

0.1

Number of training epochs

10

L2 regularization weight

0.001

☒ Normalize features

☒ Average final hypothesis

☒ Decrease learning rate

Random number seed

123

Dataset for Tune model Hyperparameter

Search for tune model hyperparameter and place in canvas

Microsoft Azure Machine Learning Studio

Linear Regression DS

In draft

tune mo

Machine Learning

Train

Tune Model Hyperpara...

Linear Regression

Tune Model Hyperparameters

Score Model

Evaluate Model

Clean missing data

Clean Missing Data

Edit Metadata

Split Data

1

2

Tune Model Hyperparameters.

Perform a parameter sweep on the model to determine the optimum parameter settings. Formerly known as Sweep Parameters

Properties

Project

Tune Model Hyperparameters

Specify parameter sweeping m...

Random sweep

Maximum number of runs ...

5

Random seed

0

Label column

Selected columns:

Launch the selector tool to make a selection

Column selector

Metric for measuring perfo...

Accuracy

Metric for measuring perfo...

Mean absolute error

Quick Help

Perform a parameter sweep on the model to determine the optimum parameter settings. Formerly known as Sweep Parameters

(more help...)

NEW

RUN HISTORY

SAVE

SAVE AS

DISCARD CHANGES

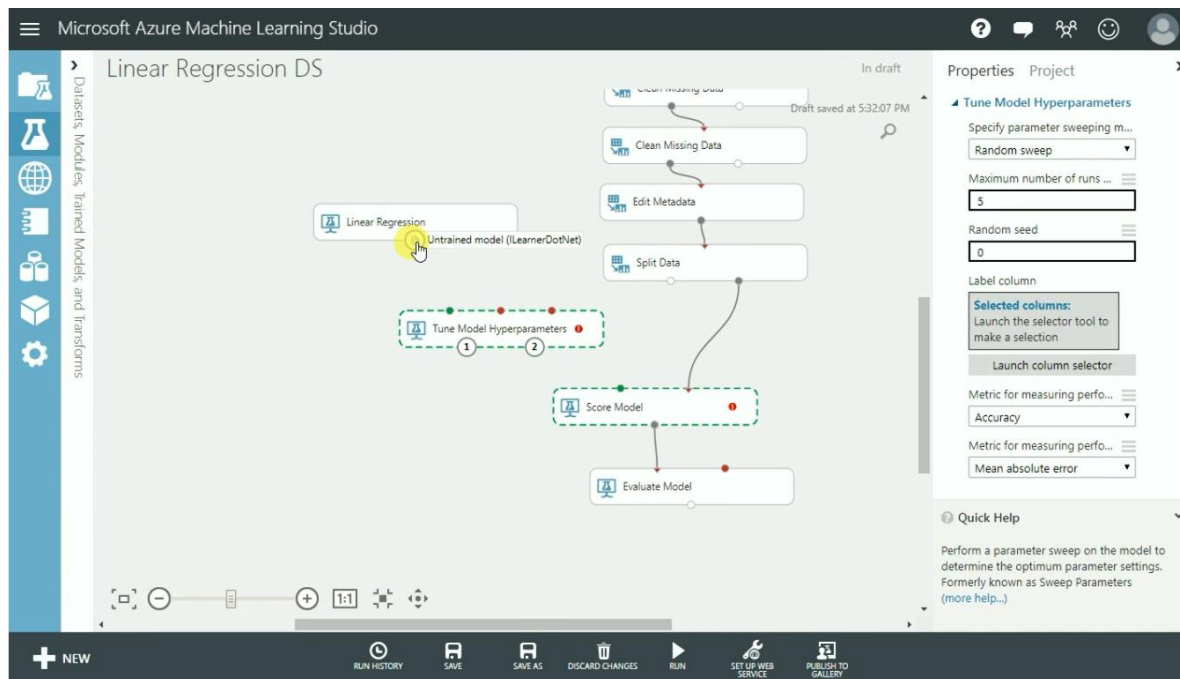
RUN

SET UP WEB SERVICE

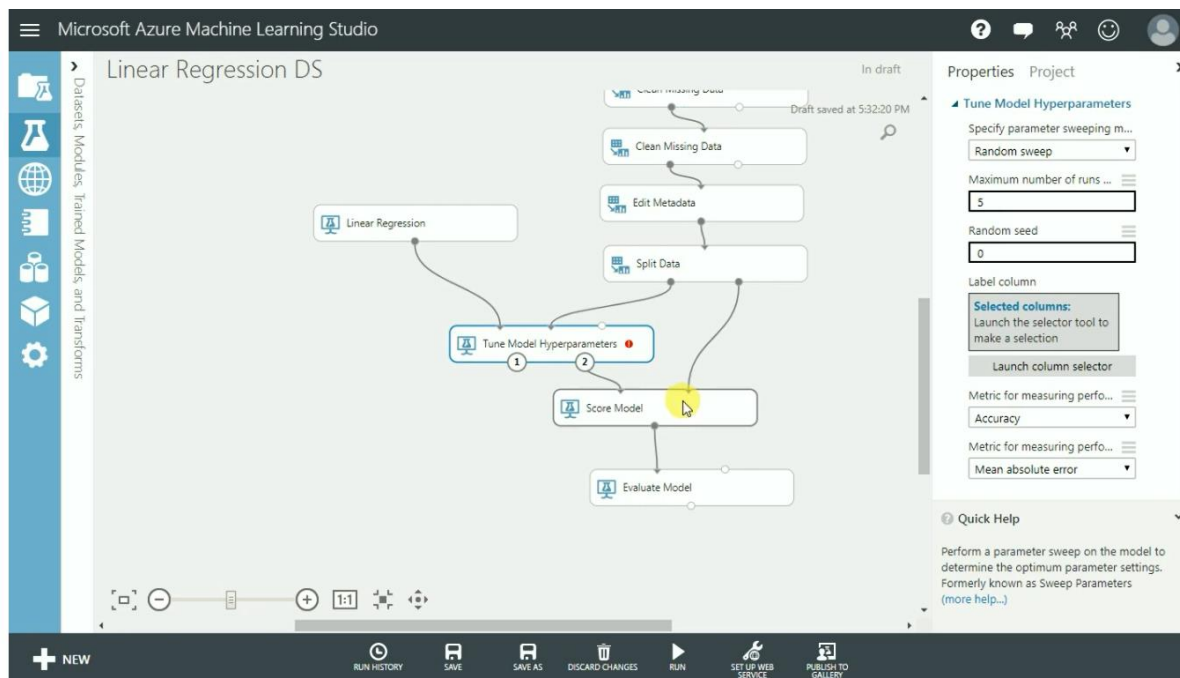
PUBLISH TO GALLERY

6

Delete trial model and place tune model hyperparameter there



Connect the nodes as shown



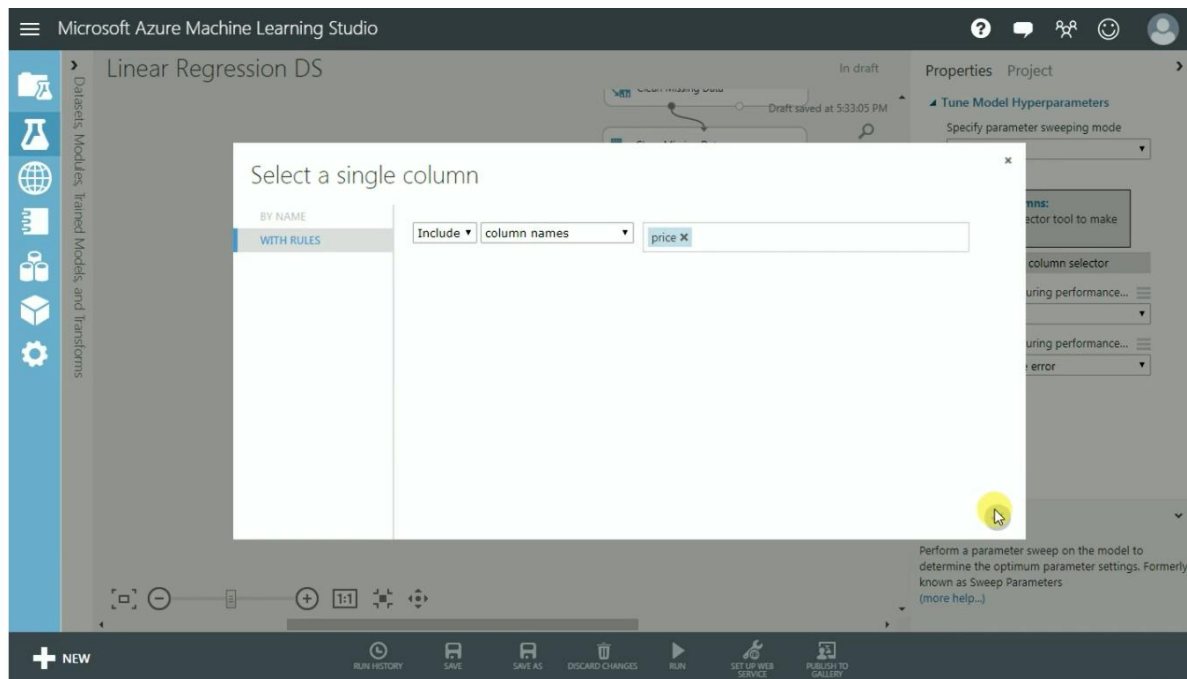
Change create trainer mode to parameter range

The screenshot shows the Microsoft Azure Machine Learning Studio interface. The main workspace displays a workflow titled 'Linear Regression DS'. The workflow includes the following steps: 'Clean Missing Data', 'Edit Metadata', 'Split Data', 'Tune Model Hyperparameters' (highlighted with a red dot and a '1' in a blue box), 'Score Model', and 'Evaluate Model'. The 'Tune Model Hyperparameters' node is connected to the 'Linear Regression' node. The 'Properties' pane on the right is open, showing the 'Linear Regression' properties. Under the 'Create trainer mode' section, the dropdown menu is open, and 'Parameter Range' is selected. Other visible properties include 'Solution method' (Online Gradient Descent), 'Number of training epochs' (10), 'L2 regularization weight' (0.001), 'Normalize features' (checked), 'Average final hypothesis' (checked), 'Decrease learning rate' (checked), and 'Random number seed' (123).

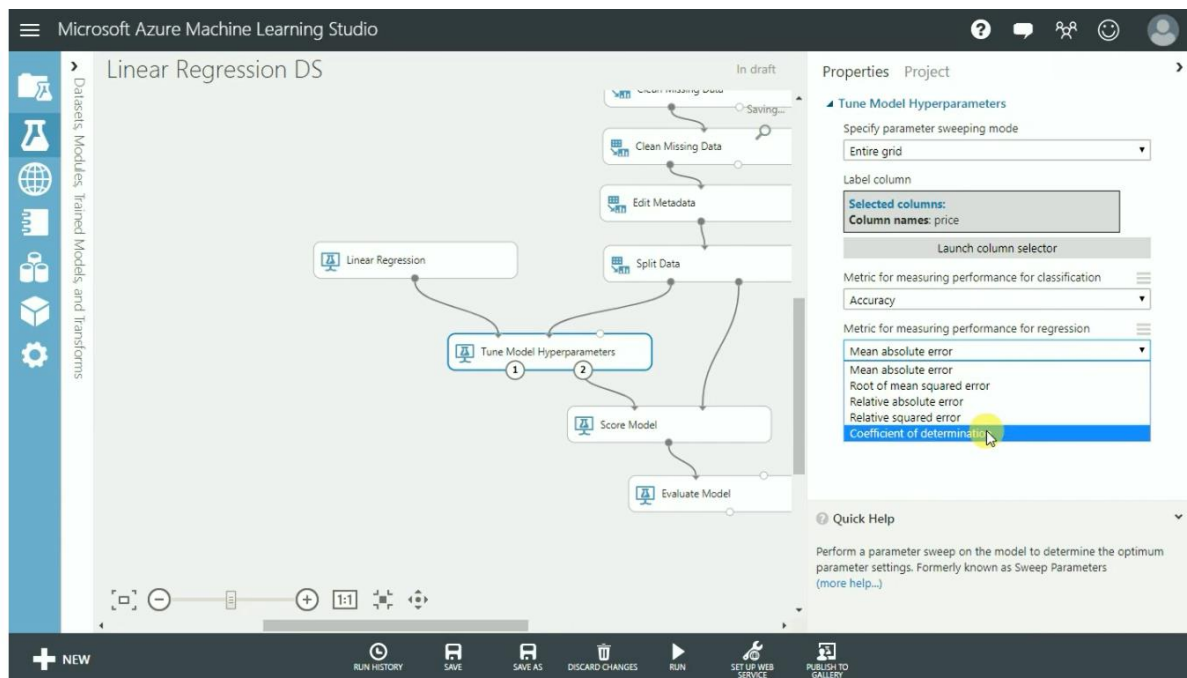
In tune model hyperparameter change parameter as Entire grid

The screenshot shows the Microsoft Azure Machine Learning Studio interface. The main workspace displays a workflow titled 'Linear Regression DS'. The workflow includes the following steps: 'Clean Missing Data', 'Edit Metadata', 'Split Data', 'Tune Model Hyperparameters' (highlighted with a red dot and a '2' in a blue box), 'Score Model', and 'Evaluate Model'. The 'Tune Model Hyperparameters' node is connected to the 'Linear Regression' node. The 'Properties' pane on the right is open, showing the 'Tune Model Hyperparameters' properties. Under the 'Specify parameter sweeping method' section, the dropdown menu is open, and 'Entire grid' is selected. Other visible properties include 'Random seed' (0), 'Label column' (Selected columns), 'Metric for measuring performance' (Accuracy), and 'Metric for measuring performance' (Mean absolute error).

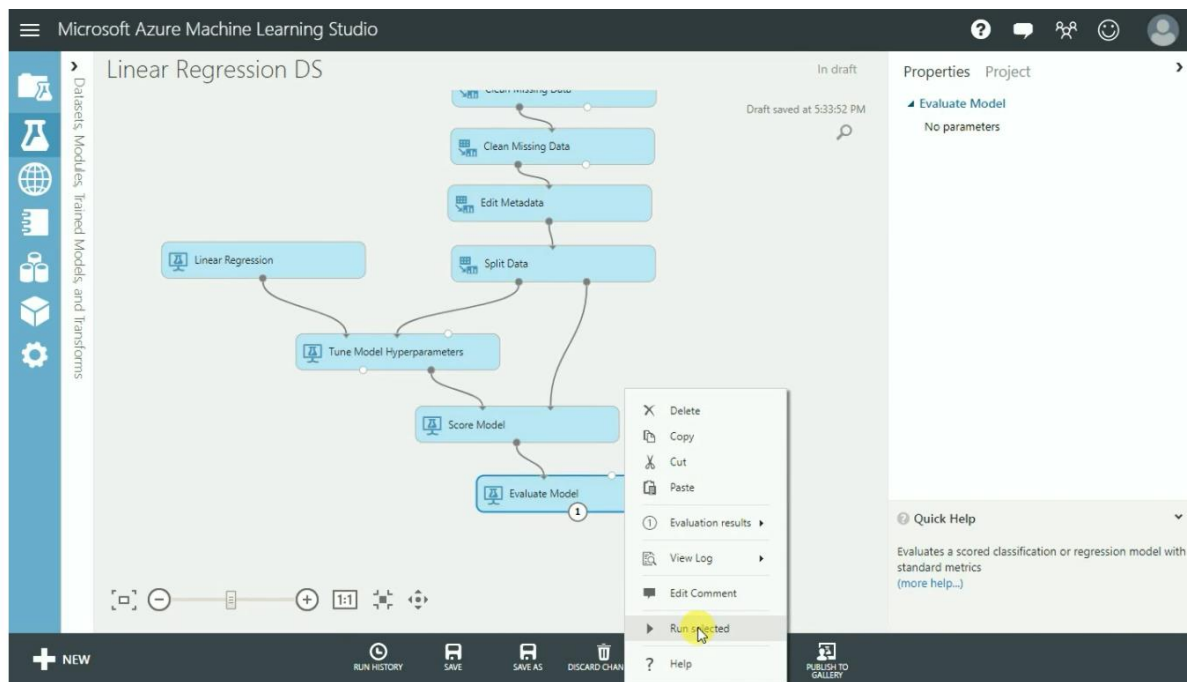
Launch column selector and select price label



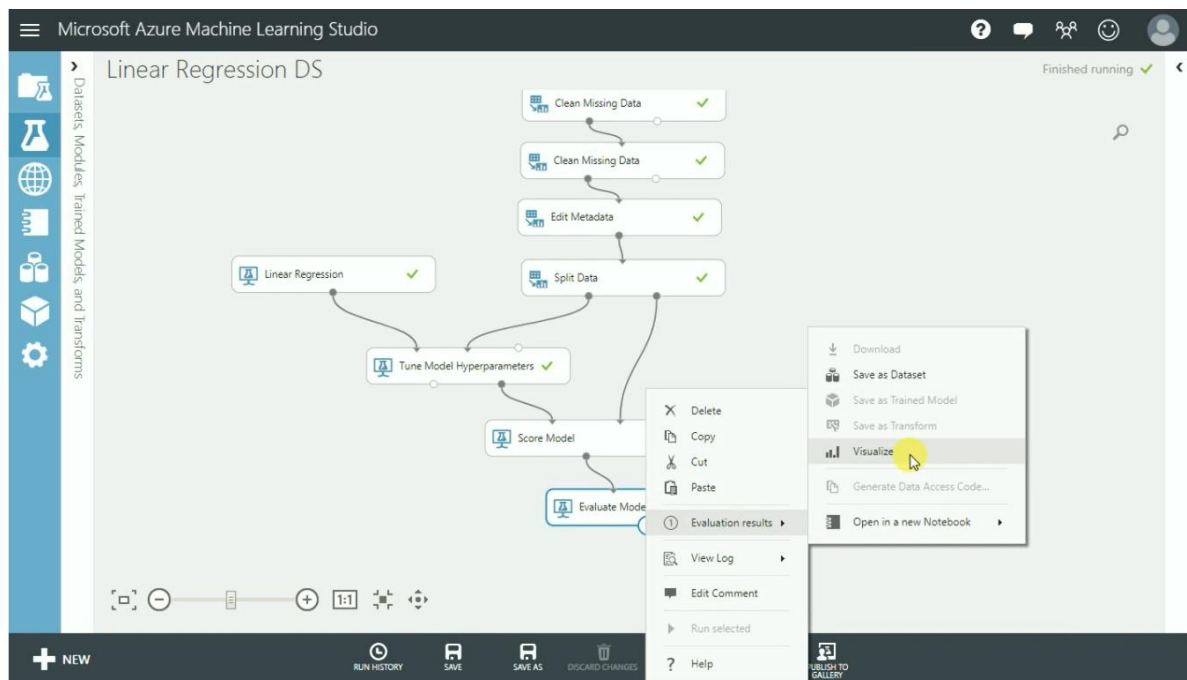
Select coefficient of determination



Run the experiment



Visualize the result



Thus, concludes how to build linear regression with online gradient

