Regression Algorithms Assignment

K.N.Toosi University of Technology
Introduction to Data Mining

Fall 2024

Part I

Practical Assignment: Linear Regression

Task

The objective of this assignment is to provide hands-on experience with fitting a linear regression model using given data points in Figure 1. Students are asked to assess their model's accuracy using *MSE* and solve for parameters α and β.

Data Points

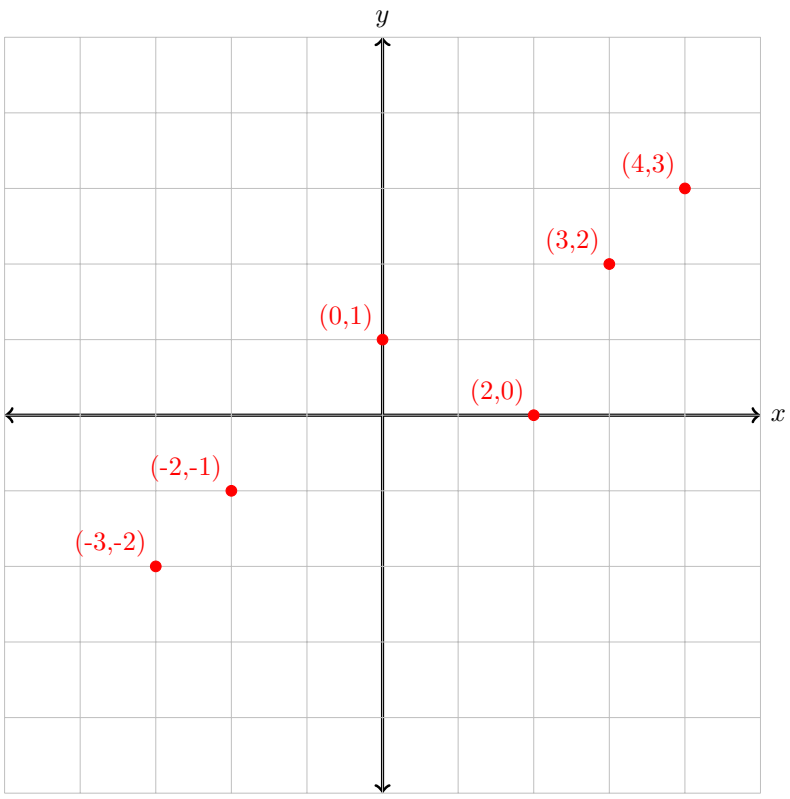

Figure 1: Linear Regression Data Points

Part II

Practical Assignment: Polynomial Regression

Task

The goal of this assignment is to fit a 3rd degree polynomial function to the given set of data points in Figure 2 and report the resulting polynomial coefficients.

Data Points

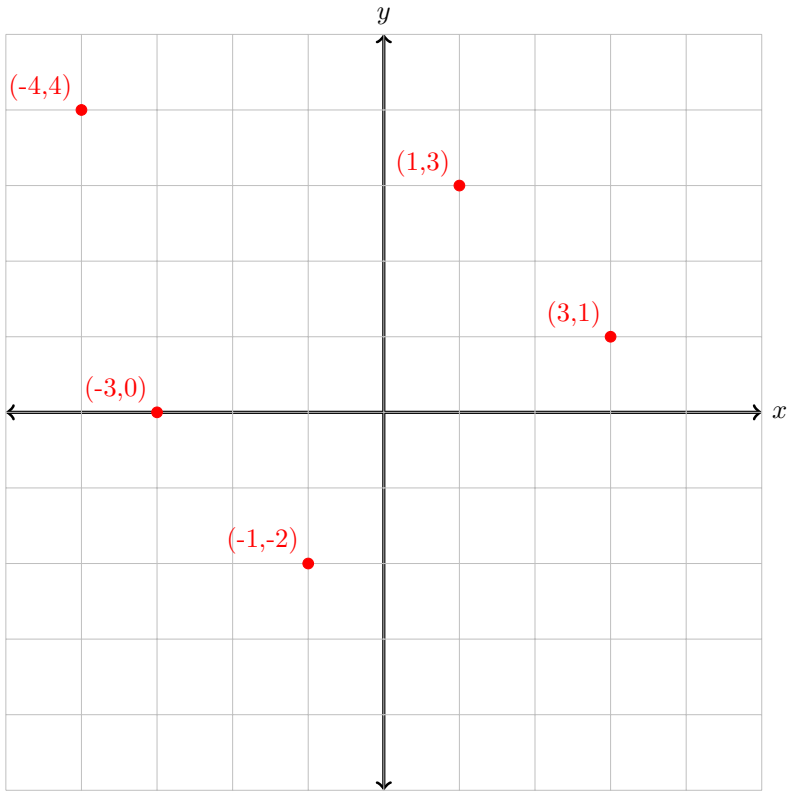

Figure 2: Polynomial Regression Data Points

Part III

Implementation Assignment

Dataset

x	y (Label)
-4.5	0
-4	0
-3.5	0
-3	0
-2.5	0
-2	1
-1.5	1
-1	1
-0.5	1
20	1

Table 1: Binary Classification Dataset

Task

This assignment aims to compare the flexibility and accuracy of logistic regression and linear regression in binary classification. You'll fit both models to the given dataset in Table 1 using scikit-learn algorithms, visualize their decision boundaries, and analyze where linear regression falls short compared to logistic regression. Both models use a 0.5 threshold, and accuracy is measured by the number of correctly classified points.

Note

Any attempt to use AI tools for generating the code is strictly prohibited. Students will be asked to present and explain their code during a class session.