Ordinary Least Squares Regression | Python

Machine Learning (ML) develops algorithms (models) that can predict an output value with an acceptable error margin, based on a set of known input parameters. **Ordinary Least Squares (OLS)** is a form of regression, widely used in Machine Learning.

The **Ordinary Least Squares** (OLS) regression technique falls under the Supervised Learning. It is a method for estimating the **unknown parameters** by creating a model which will minimize the sum of the squared errors between the observed data and the predicted one. This means that given a **regression line** through the data you calculate the distance from each data point to the regression line, square it, and sum all of the squared errors together. This is the quantity that ordinary least squares seeks to minimize.

$$m = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2}$$

$x = independent\ variables$

$\bar{x} = average\ of independent\ variables$

$y = dependent\ variables$

$\bar{y} = average\ of dependent\ variables$

OLS method works for both **univariate dataset** (single independent variables and single dependent variables) and **multi-variate dataset** (single independent variable set and multiple dependent variables sets). An example of a scenario in which one may use **OLS** (Ordinary Least Squares) is in predicting Food Price from a data set that includes Food Quality and Service Quality.