Linear Regression

Linear regression

In linear regression, the equation that describes the feature-target relationships is $Y=mX+C$ where X and Y are vectors that describe the feature and target variable respectively.

Multiple Linear Regression

In a multiple linear regression case, we are interested in the impact of not only one, but many different features, on the target variable.

The equation can be written as $Y=m_1X_1+m_2X_2+C$ where m1 and m2 are the coefficients of features X1 and X2 respectively.

Polynomial Regression

For polynomial regression, we might use higher powers of X to describe Y, as described in

$Y=m_1X+m_2 X^2+C$

where m1 and m2 are coefficients of the first and second powers of the factor.

Performance Metrics

Mean Absolute Error (MAE)

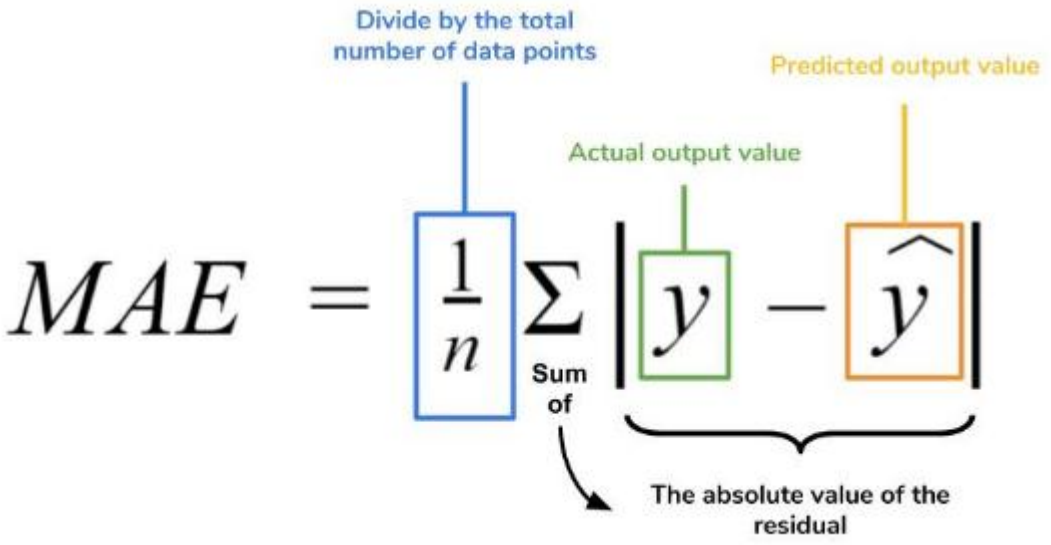
Mean Squared Error (MSE)

Root Mean Squared Error (RMSE)

The coefficient of determination (R-squared)

Mean Absolute Error

Mean Absolute Error (MAE) is the mean of the absolute value of the errors. It is calculated as:



Mean Squared Error

Mean Squared Error (MSE) is the mean of the squared errors and is calculated as:

$$MSE = \frac{1}{n}\Sigma\underbrace{\left(y - \hat{y}\right)}^{2}$$

The square of the difference between actual and predicted

Root Mean Squared Error

Root Mean Squared Error (RMSE) is the square root of the mean of the squared errors:

$$\mathrm{RMSE} = \sqrt{\frac{1}{n}\sum_{j=1}^{n}(y_j - \hat{y}_j)^2}$$

R-squared

R-squared - The coefficient of determination

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

x :Actual value

y: Predicted value