

Normal Equation

- Linear relationships
- No || little collinearity

\hookrightarrow No $\overbrace{xxx}^x \overbrace{x}^y$

• Label is $f(x,y)$

• f_{θ} is x

Classification - Logistic Regression

- Logistic Regression [Classification]

- Linear Regression [Regression Alg]

- Supervised Learning Alg.

$\begin{array}{l} \text{Cat} \\ \uparrow \\ x \rightsquigarrow 0 \text{ or } 1 \end{array}$

$$\rightarrow y(x) = \theta_0 + \theta_1 x_1 + \dots + \theta_n x_n$$

$$\hat{y} = \sigma(z)$$

\uparrow

y

$$\theta \cdot x = \boxed{\text{for } y}$$

$$h(x) = \frac{1}{1+e^{-z}}$$

if ($\hat{y} > 0.5$) isCat == true

else

isCat == false

$$h(x) = \sigma(z) = \frac{1}{1+e^{-z}}$$

$$\nabla_{\theta} J(\theta) = -\frac{1}{m} \sum_{i=1}^m (y^{(i)} - \hat{y}^{(i)}) x_i$$

Vectorized

$$\theta_0 = \theta_0 - \frac{1}{m} \sum_{i=1}^m (y^{(i)} - \hat{y}^{(i)}) x_i$$

$$\theta = \sigma(z) =$$

if $0.5 > 1$
No - Yes

Ridge Regression Vs Lasso Regression

What is Lasso Regression?

- Reduce ft. X
- Remove Useless Features

Lasso regression is a regularization technique. It is used over regression methods for a more accurate prediction. This model uses shrinkage. Shrinkage is where data values are shrunk towards a central point as the mean. The lasso procedure encourages simple, sparse models (i.e. models with fewer parameters). This particular type of regression is well-suited for models showing

Lasso Meaning

The word "LASSO" stands for Least Absolute Shrinkage and Selection Operator. It is a statistical formula for the regularisation of data models and feature selection.

Regularization

Regularization is an important concept that is used to avoid overfitting of the data, especially when the trained and test data are much varying.

$$\theta = 0$$
$$\theta \cdot zeta = 0$$

At the end of the cost function

$$\propto \frac{1}{2} \sum_{i=1}^n \theta_i^2$$

Ridge Regression

$$f(\theta) = \frac{1}{m} + \sum_{i=1}^m (\theta^T \cdot X^{(i)} - y^{(i)})^2 + \alpha \frac{1}{2} \sum_{i=1}^n \theta_i^2$$

Regulation

$$\begin{array}{r} \cancel{1} \cancel{2} \cancel{2} \\ - \cancel{1} \cancel{1} \\ \hline 11 \end{array}$$

$$\begin{array}{r} \cancel{2} \cancel{3}^{15} \\ - \cancel{1} \cancel{5} \\ \hline 0 \end{array}$$

$$\begin{array}{r} 15 \\ - 10 \\ \hline 05 \end{array}$$

$$\begin{array}{r} 15 \\ - 3 \\ \hline 12 \end{array}$$

$$\begin{array}{r} \cancel{1} \cancel{3} \\ - \cancel{4} \cancel{5} \\ \hline 40 \end{array}$$

$$\begin{array}{r} 8 \cancel{1} \cancel{3} \\ 9 \cancel{3} \cancel{5} \\ - 45 \\ \hline 890 \end{array}$$

