Siddhardhan

Loss Function in Machine Learning

$$\frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$$

Loss Function

Loss function measures how far an estimated value is from its true value.

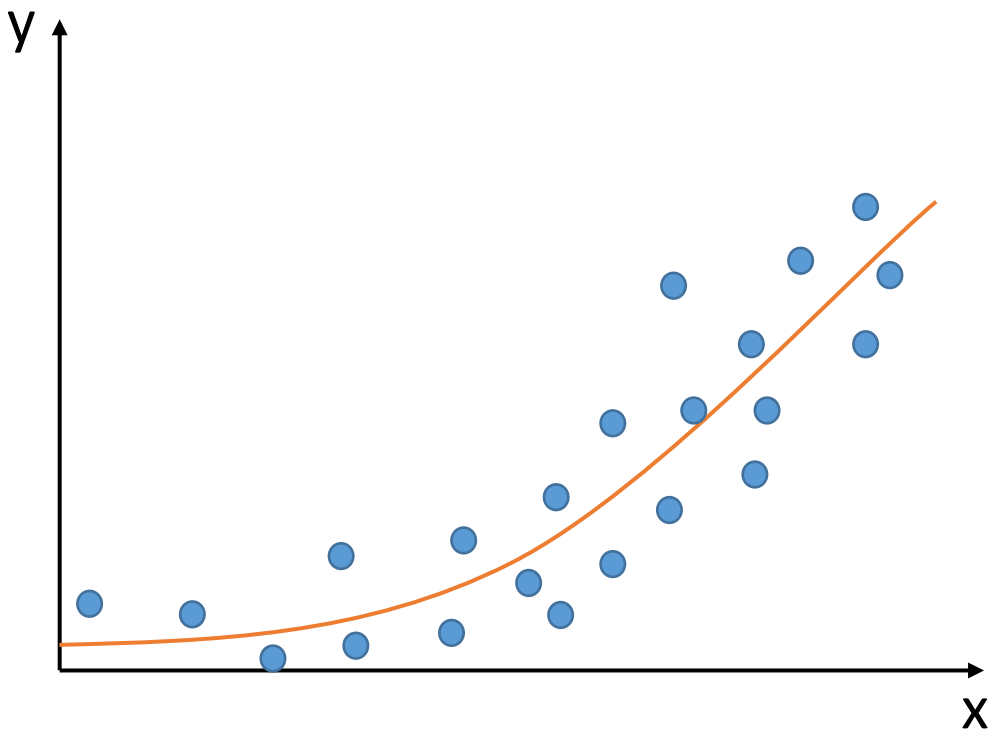
It is helpful to determine which model performs better & which parameters are better.

$$\textbf{\textit{Loss}} \quad = \quad \frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$$

Types of Loss Function:

- ❖ Cross Entropy Loss
- ❖ Squared Error Loss
- ❖ KL Divergence

Loss Function



$$y = 0.0000003x^3 + 0.0002x^2 + 0.010x + 0.025$$

Degree 3 Polynomial

Loss Function

$y_1 = 0.0000015x^3 + 0.0042x^2 + 0.020x + 0.035$

$y_2 = 0.0000023x^3 + 0.0001x^2 + 0.015x + 0.020$

$y_3 = 0.0000045x^3 + 0.0003x^2 + 0.040x + 0.028$

$y = 0.0000003x^3 + 0.0002x^2 + 0.010x + 0.025$

x	y	y_1	y_2	y_3
0.30	0.35	0.38	0.39	0.41
0.45	0.48	0.45	0.47	0.56
0.50	0.55	0.59	0.58	0.63
0.55	0.63	0.65	0.69	0.70
0.66	0.72	0.75	0.78	0.78

Loss Function

x	y	y_1	y_2	y_3
0.30	0.35	0.38	0.39	0.41
0.45	0.48	0.45	0.47	0.56
0.50	0.55	0.59	0.58	0.63
0.55	0.63	0.65	0.69	0.70
0.66	0.72	0.75	0.78	0.78

$$Loss = \frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$$

$Loss_1 = [\ (0.35-0.38)^2 + (0.48-0.45)^2 + (0.55-0.59)^2 + (0.63-0.65)^2 + (0.72-0.75)^2\ ] / 5$

$Loss_1 = 0.173$

Low Loss value → High Accuracy

SIDDHARDHAN

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