



4 notes 4 screenshots

00:44



cost function

**Cost function** - is the error representation in machine learning

It shows how our model is predicting compared to the actual values.

Lesser the cost function ↓ more the accuracy ↑

higher the cost function ↑ lesser the accuracy ↓

29 minutes ago

03:14



For regression problem

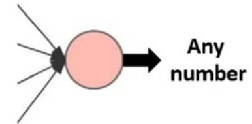
## For Regression Problem

$$\text{error} = |a_i - y_i|$$

$$\text{cost} = \frac{1}{m} \sum_{i=1}^m |a_i - y_i| \leftarrow \text{Mean Absolute Error}$$

$$\text{cost} = \frac{1}{2m} \sum_{i=1}^m |a_i - y_i|^2 \leftarrow \text{Mean Squared Error}$$

$$\text{Loss} = |a_i - y_i| \quad i^{\text{th}} \text{ observation}$$



House Price  
Prediction

20 minutes ago

06:30

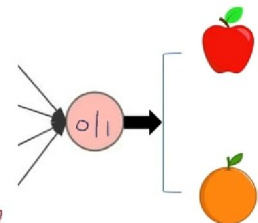


For binary classification

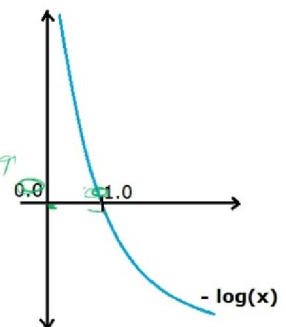
## For Binary Classification

$$\text{error} = -[y_i \log(a_i) + (1 - y_i) \log(1 - a_i)]$$

$$\text{cost} = \frac{1}{m} \sum [y_i \log(a_i) + (1 - y_i) \log(1 - a_i)]$$



$$\begin{aligned} \underline{y_i = 0} \\ \text{error} &= -(1 - \cancel{y_i}) \log(1 - a_i) = -\log(1 - a_i) \quad \downarrow \rightarrow a_i \rightarrow 0 \\ &\quad \text{or } \rightarrow 1, \text{ error} \uparrow \\ \underline{y_i = 1} \\ \text{error} &= -\log(a_i) \end{aligned}$$



10 minutes ago

09:04

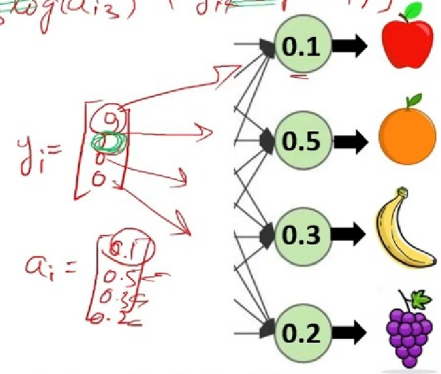


for multi-class classification

## For Multi-Class Classification

$$\text{cost} = -\frac{1}{m} \sum_i [y_{i1} \log(a_{i1}) + y_{i2} \log(a_{i2}) + y_{i3} \log(a_{i3}) + y_{i4} \log(a_{i4})]$$

$\text{error}_{a_i} = -\log(0.5)$



$$\text{cost} = - \sum_{j=0}^M \sum_{i=0}^N (y_{ij} * \log(a_{ij}))$$

$n$  = total neurons in output layer  
 $m$  = total number of observations

**Categorical Cross Entropy**

3 minutes ago