

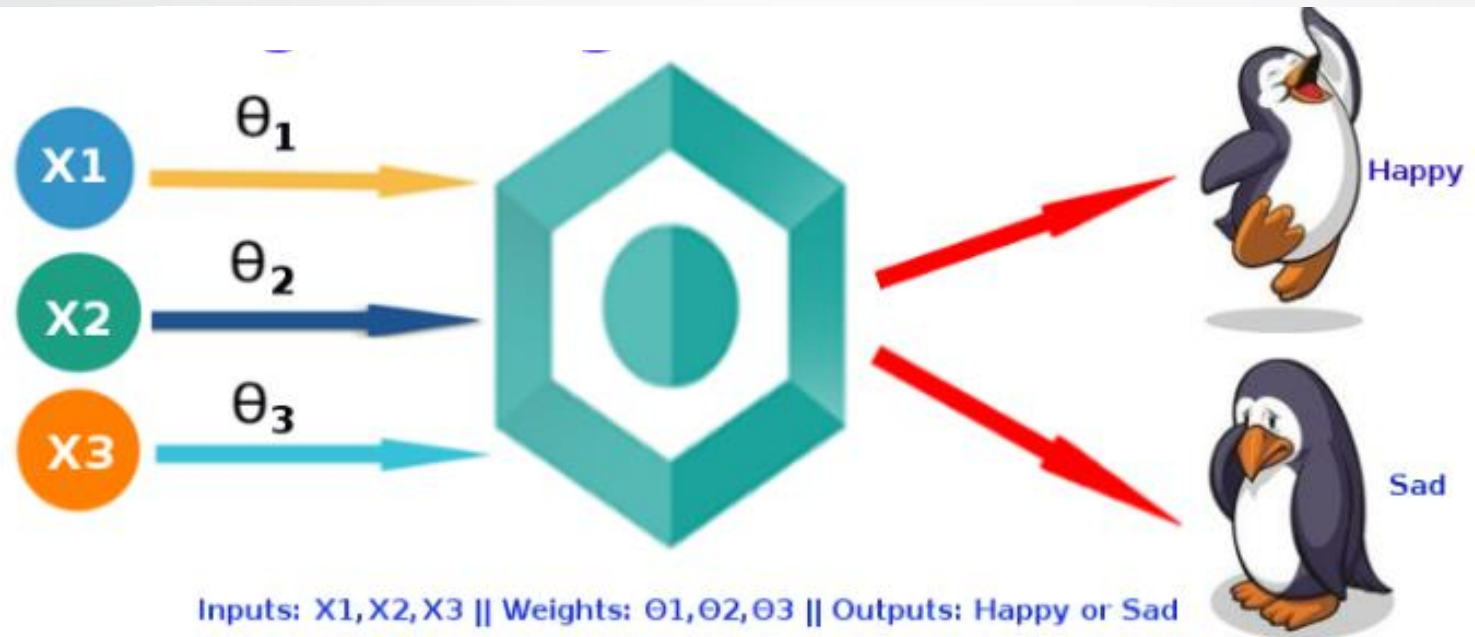


Logistic Regression

By: L Vinay Rajiv Reddy

What is Logistic Regression ?

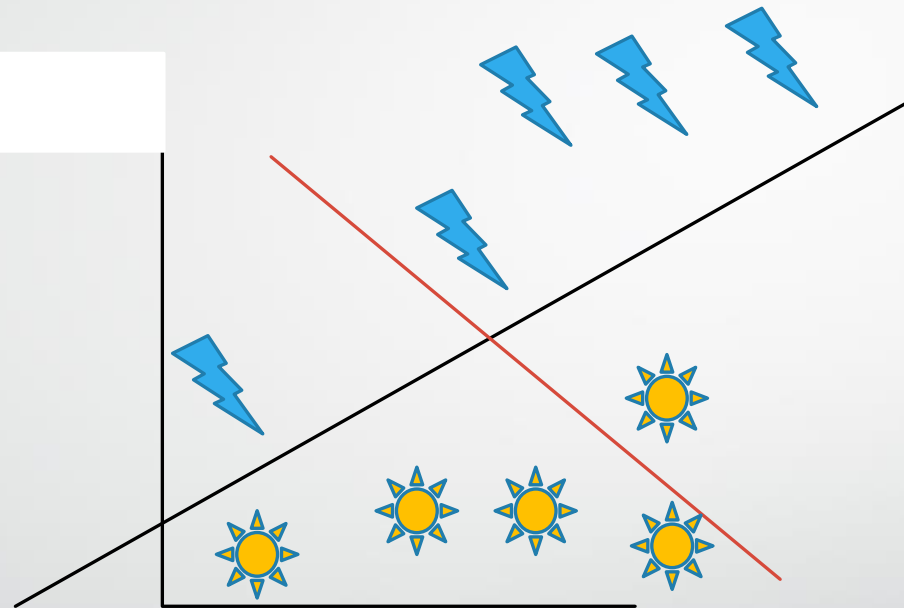
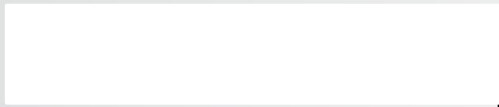




What is Logistic Regression ?

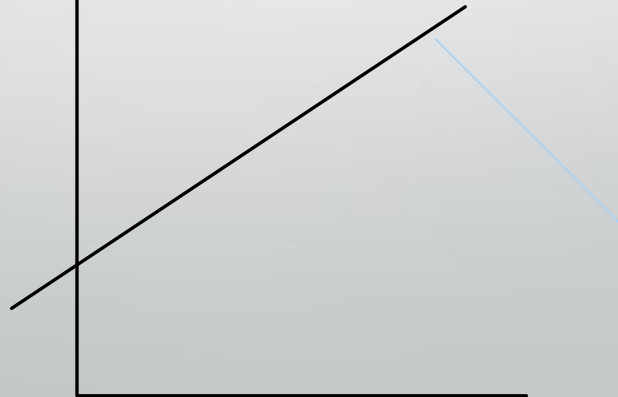
- Traditional model for Classification Data problems.
- Example: a) Predicting if student pass/fail in upcoming exam.
b) Predicting if the weather will be cloudy or sunny on tomorrow.

Working :



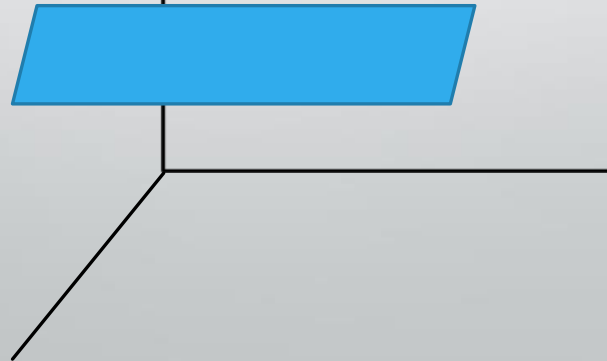
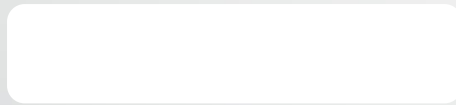
Simple Logistic Regression

- For simple logistic regression : $Y=mX+C$



For Multi Variable Regression

- For multi variable logistic regression $= Y = m_1x_1 + m_2x_2 + \dots + m_nx_n + C$



Cost Function:

- Determines how the model is working.
- Simply it's sum of all the errors.

FOR A GIVEN THETA 0 AND THETA 1...

2. FIND THE DIFFERENCE BETWEEN THE PREDICTED AND ACTUAL VALUES

1. THE PREDICTED VALUE

$$J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^m (h_{\theta}(x^i) - y^i)^2$$

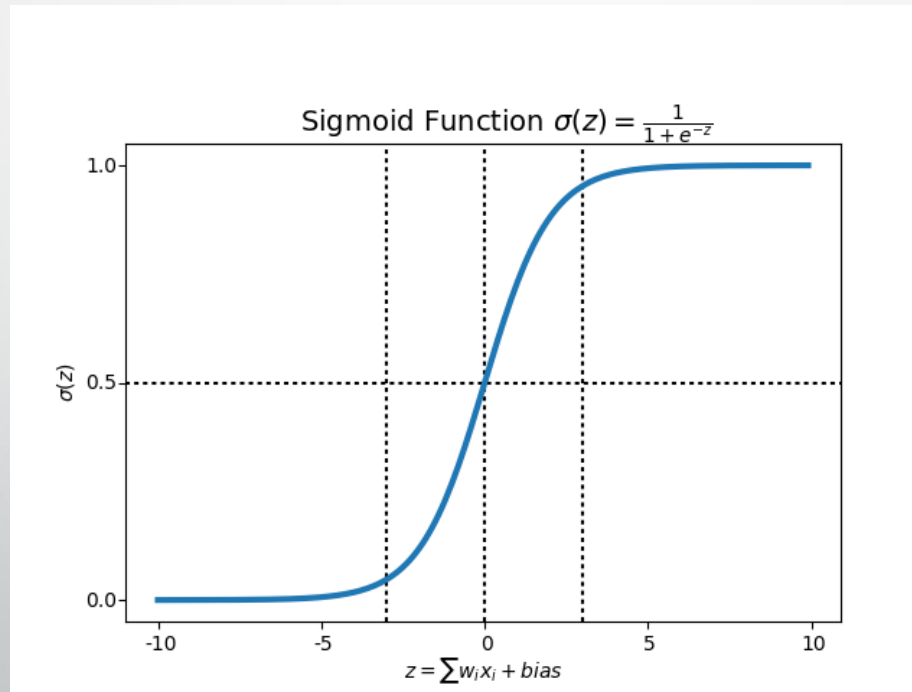
4. FIND THE AVERAGE

3. FIND **ALL** THE DIFFERENCES BETWEEN PREDICTED AND ACTUAL

The diagram illustrates the components of the cost function. A bracket above the parameters θ_0 and θ_1 in the formula is linked to the text 'FOR A GIVEN THETA 0 AND THETA 1...'. A bracket above the term $h_{\theta}(x^i)$ is linked to '1. THE PREDICTED VALUE'. A bracket above the entire summation term $\sum_{i=1}^m (h_{\theta}(x^i) - y^i)^2$ is linked to '3. FIND ALL THE DIFFERENCES BETWEEN PREDICTED AND ACTUAL'. An arrow points from the denominator $2m$ to '4. FIND THE AVERAGE'. A bracket above the difference term $(h_{\theta}(x^i) - y^i)$ is linked to '2. FIND THE DIFFERENCE BETWEEN THE PREDICTED AND ACTUAL VALUES'.

Sigmoid Function

- Error is not in distance, but unable to separation.



Multi variable

