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AI

2 주 차

목차

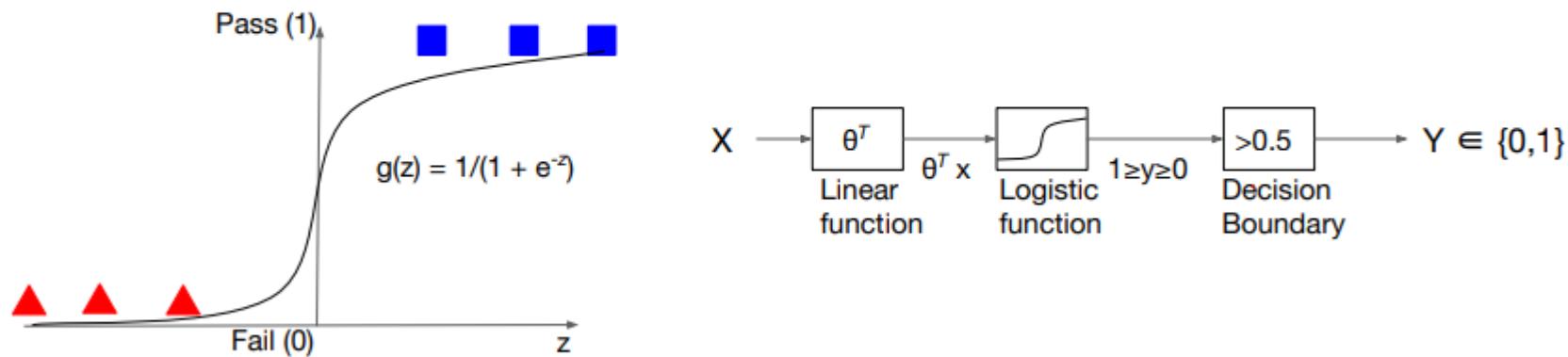
- Logistic Regrssion
- Logistic Regrssion cost
- Softmax Regression
- Softmax Regression cost

Logistic Regression

...

Sigmoid (Logistic) function

$g(z)$ function out value is between 0 and 1



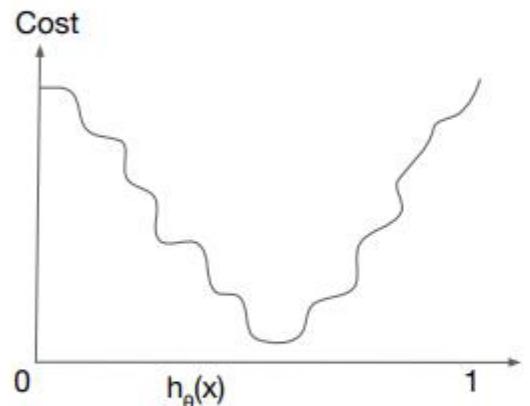
Where we define $g(z) \rightarrow z$ is a real number $\rightarrow g(z) = e^z/(e^z + 1) = 1/(1 + e^{-z})$

Logistic Regression Cost

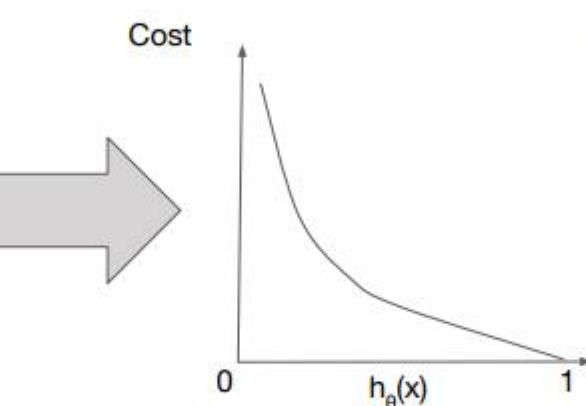
...

Cost Function

A convex logistic regression cost function



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



$$\text{Cost}(h_\theta(x), y) = \begin{cases} -\log(h_\theta(x)) & \text{if } y = 1 \\ -\log(1 - h_\theta(x)) & \text{if } y = 0 \end{cases}$$

$$\text{cost}(h_\theta(x), y) = -y \log(h_\theta(x)) - (1-y) \log(1 - h_\theta(x))$$

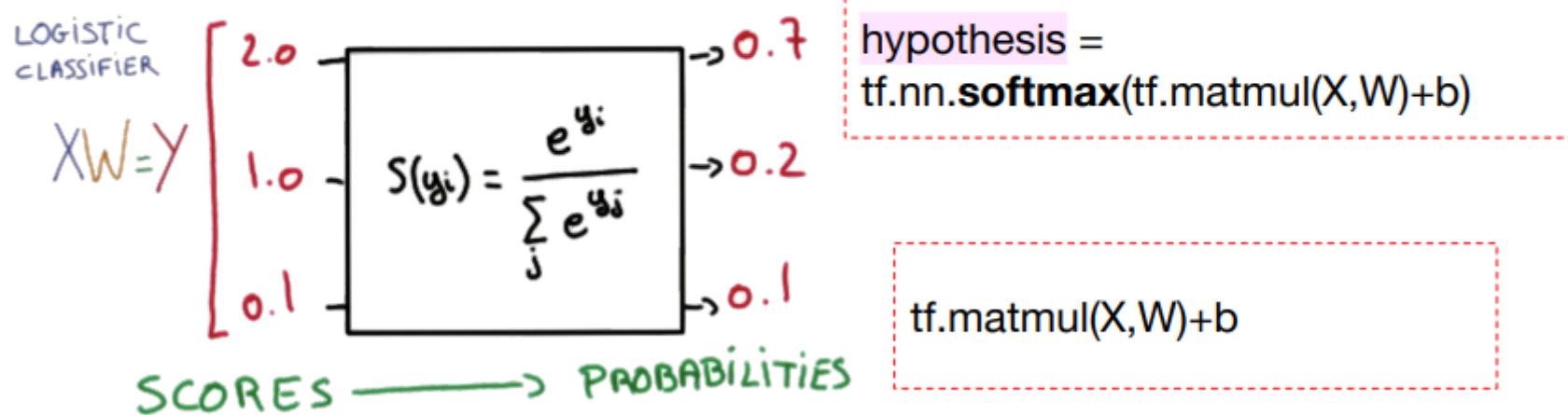
[Tensorflow Code]

```
cost = -tf.reduce_mean(labels * tf.log(hypothesis) + (1 - labels) * tf.log(1 - hypothesis))
```

Softmax Regression

...

Softmax function



Softmax Regression Cost

...

Cost function: cross entropy

The diagram illustrates the cross-entropy loss function. A blue arrow labeled "LOSS" points down to the formula. A green arrow labeled "TRAINING SET" points from below to the summation symbol. A blue arrow labeled "STEP" points right to the gradient descent update rule.

$$\mathcal{L} = \frac{1}{N} \sum_i D(s(wx_i + b), l_i)$$

```
# Cross entropy cost/loss
cost = tf.reduce_mean(-tf.reduce_sum(Y * tf.log(hypothesis), axis=1))

optimizer = tf.train.GradientDescentOptimizer(learning_rate=0.1).minimize(cost)
```

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Thank You

로 봇 동 아 리