
성 균 관 대 학 교
SIOR
로 봇 학 회

2022년 04월 28일

AI

2 주 차

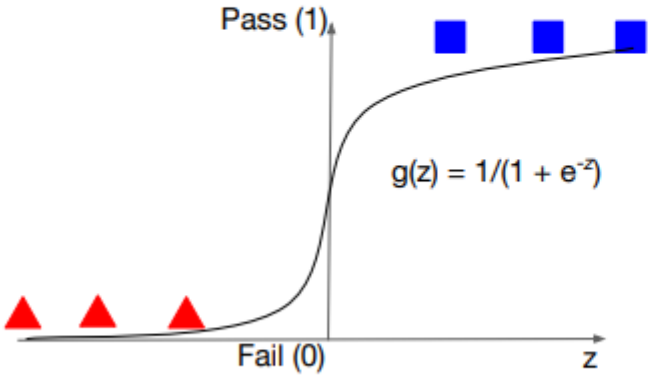
목차

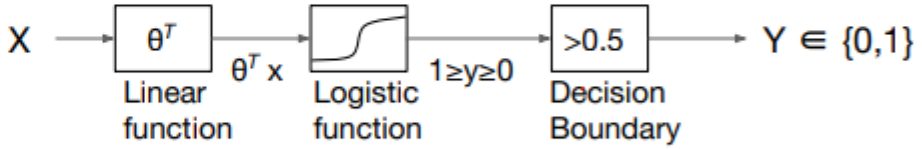
Logicstic Regression

...

Sigmoid (Logistic) function

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





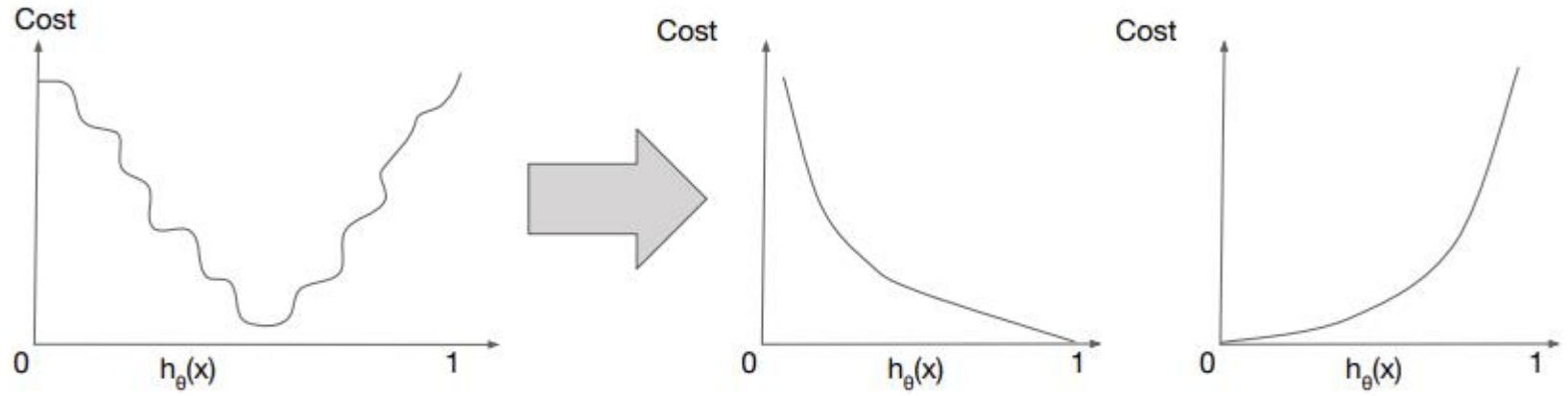
Where we define g(z) -> z is a real number -> $g(z) = e^z/(e^z + 1) = 1/(1 + e^{-z})$

Logicstic Regression Cost

...

Cost Function

A convex logistic regression cost function



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

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

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

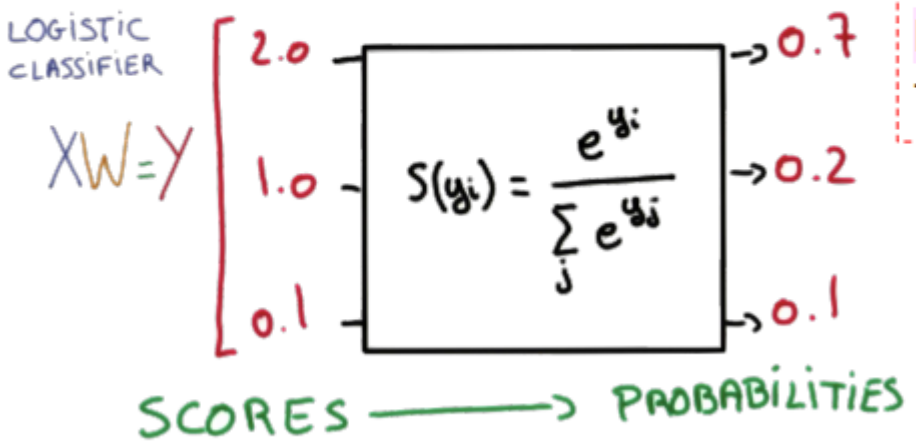
[Tensorflow Code]

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

Softmax Regression

...

Softmax function



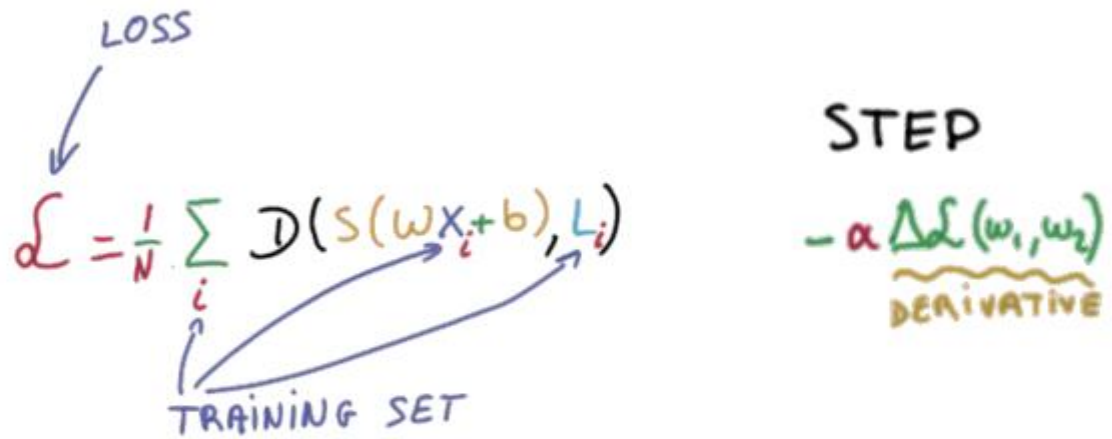
hypothesis =
tf.nn.**softmax**(tf.matmul(X,W)+b)

tf.matmul(X,W)+b

Softmax Regression Cost

...

Cost function: cross entropy




```
# 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)
```

성 균 관 대 학 교

Thank You

로 봇 동 아 리