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Practice quiz: Cost function for logistic regression

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1.

1 / 1 point

$$\overbrace{J(\vec{w}, b)}^{?} = \frac{1}{m} \sum_{i=1}^m \underbrace{L(f_{\vec{w}, b}(\vec{x}^{(i)}), y^{(i)})}_{?}$$

In this lecture series, "cost" and "loss" have distinct meanings. Which one applies to a single training example?

☒ Loss

✔ Correct

In these lectures, loss is calculated on a single training example. It is worth noting that this definition is not universal. Other lecture series may have a different definition.

☐ Cost

☐ Both Loss and Cost

☐ Neither Loss nor Cost

2.

1 / 1 point

Simplified **loss** function

$$L(f_{\vec{w}, b}(\vec{x}^{(i)}), y^{(i)}) = \begin{cases} -\log(f_{\vec{w}, b}(\vec{x}^{(i)})) & \text{if } y^{(i)} = 1 \end{cases}$$

$$L(f_{\vec{w},b}(\vec{x}^{(i)}), y^{(i)}) = \begin{cases} -\log(1 - f_{\vec{w},b}(\vec{x}^{(i)})) & \text{if } y^{(i)} = 0 \end{cases}$$

$$L(f_{\vec{w},b}(\vec{x}^{(i)}), y^{(i)}) = -y^{(i)}\log(f_{\vec{w},b}(\vec{x}^{(i)})) - (1 - y^{(i)})\log(1 - f_{\vec{w},b}(\vec{x}^{(i)}))$$

For the simplified loss function, if the label $y^{(i)} = 0$, then what does this expression simplify to?

- ☐ $-\log(1 - f_{\vec{w},b}(\mathbf{x}^{(i)})) - \log(1 - f_{\vec{w},b}(\mathbf{x}^{(i)}))$
- ☐ $\log(f_{\vec{w},b}(\mathbf{x}^{(i)}))$
- ☐ $\log(1 - f_{\vec{w},b}(\mathbf{x}^{(i)})) + \log(1 - f_{\vec{w},b}(\mathbf{x}^{(i)}))$
- ☒ $-\log(1 - f_{\vec{w},b}(\mathbf{x}^{(i)}))$

✓ Correct

When $y^{(i)} = 0$, the first term reduces to zero.