

Large Scale Machine Learning and Deep Learning

Review Questions 2

1. What is cross validation and how does it work?

2. Mathematically show that the softmax function with two classes ($k = 2$) is equivalent to the sigmoid function?

3. As you know, in binomial logistic regression the **cost** between the true value y and the predicted value \hat{y} is measured as below:

$$\text{cost}(\hat{y}, y) = \begin{cases} -\log(\hat{y}) & \text{if } y = 1 \\ -\log(1 - \hat{y}) & \text{if } y = 0 \end{cases}$$

Explain why $-\log$ is a proper function to compute the cost in logistic regression?

4. How are logistic regression cost, cross-entropy, and negative log-likelihood related?

5. Explain how a ROC curve works?