# [Quiz] Logistic Regression

- Due 6 Apr at 23:59
- Points 10
- Questions 10
- Time limit None
- Allowed attempts 2

This quiz is no longer available as the course has been concluded.

## Attempt history

| | Attempt | Time | Score |
|---|---|---|---|
| **KEPT** | Attempt 2 | 2 minutes | 10 out of 10 |
| **LATEST** | Attempt 2 | 2 minutes | 10 out of 10 |
| | Attempt 1 | 8 minutes | 8.67 out of 10 |

Score for this attempt: 10 out of 10
Submitted 18 Mar at 22:13
This attempt took 2 minutes.

Question 1
1 / 1 pts

True or false.

Multi-class logistic regression with the softmax activation function needs the labels $\mathbf{y}$ to be converted to a one-hot encoding in order to use the generalized NLL cost function?

Correct!

- True
- False

Question 2
1 / 1 pts

Select all that apply.

Suppose that you have trained a binary logistic regression classifier and for a single data sample it outputs the prediction $P(y \mid \mathbf{x}; \mathbf{w}) = f(\mathbf{x}; \mathbf{w}) = 0.7$. This means, which of the following are true?

- The negative class probability is 0.7.

Correct!

- The positive class probability is 0.7.

Correct!

- The negative class probability is 0.3.
- The positive class probability is 0.3.

Question 3
1 / 1 pts

Select all that apply.

The intuition behind the negative log likelihood (NLL) cost function corresponds to which of the following statements.

Correct!

- smaller probabilities map to larger loss values
- smaller probabilities map to smaller loss values

Correct!

- higher probabilities map to smaller loss values.
- higher probabilities map to larger loss values.

Question 4
1 / 1 pts

Which of the following is the range of values the sigmoid function $\frac{1}{1+e^{-z}}$ squashes numbers to be within?

- $-\infty$ to $\infty$
- -1 to 1
- 0 to $\infty$

Correct!

- 0 to 1

Question 5
1 / 1 pts

True or false.

The gradient for negative log likelihood **changes** when using sigmoid activation function instead of using the softmax activation function?

- True

Correct!

- False

Question 6
1 / 1 pts

Select all that apply.

When computing the softmax $\frac{e^{\mathbf{z}_i}}{\sum_{k=1}^{K} e^{\mathbf{z}_k}}$ for a single data sample. Which of the following best describe the vector $\mathbf{z}$.

Correct!

- The rows correspond to data samples
- Each element contains discrete values

Correct!

- Each element contains continuous values

Correct!

- The columns correspond to classes

Question 7
1 / 1 pts

Compute the loss for the cross-entropy (i.e., generalized NLL) cost function $-\mathbf{y}_i \log_e[f(\mathbf{x}_i; \mathbf{w})]$ given

$\mathbf{y}_i = [0, 0, 1]$

$f(\mathbf{x}; \mathbf{w}) = [0.1, 0.5, 0.4]$

- 2.30

Correct!

- 0.91
- 0.69
- 3.91

Question 8
1 / 1 pts

Compute the loss for the binary NLL cost function $-y_i \log_e[f(\mathbf{x}_i; \mathbf{w})] - (1 - y_i) \log_e[1 - f(\mathbf{x}_i; \mathbf{w})]$ given

$y_i = 1$

$f(\mathbf{x}_i; \mathbf{w}) = 0.7$

Correct!

- 0.35
- -1.20
- 1.20
- -0.35

Question 9
1 / 1 pts

Select all that apply.

Logistic regression using either the sigmoid or softmax activation works mainly for which of the following types of data.

Correct!

- [x] separable linear data

Correct!

- [x] non-separable linear data
- [ ] non-separable non-linear data
- [ ] separable non-linear data

Question 10
1 / 1 pts

When using the multi-class classification with softmax activation function given 100 data samples, 20 features, and 10 classes, what would the shape of the weights be?

- ( ) (10, 1)
- ( ) (100, 20)
- ( ) (20, 1)

Correct!

- (•) (20, 10)

Quiz score: 10 out of 10