# Learning Linear Classifiers

**4/6** points earned (66%)

You haven't passed yet. You need at least 80% to pass.
Review the material and try again! You have 3 attempts every 8 hours.

Review Related Lesson

1 / 1 points

1.
(True/False) A linear classifier can only learn positive coefficients.

- True
- False

**Correct**

1 / 1 points

2.
(True/False) In order to train a logistic regression model, we find the weights that maximize the likelihood of the model.

- True

**Correct**

- False

1 / 1 points

3.
(True/False) The data likelihood is the product of the probability of the inputs $\mathbf{x}$ given the weights $\mathbf{w}$ and response $y$.

- True
- False

**Correct**

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0 / 1 points

4.
Questions 4 and 5 refer to the following scenario.

Consider the setting where our inputs are 1-dimensional. We have data

| $x$ | $y$ |
|---|---|
| 2.5 | +1 |
| 0.3 | -1 |
| 2.8 | +1 |
| 0.5 | +1 |

and the current estimates of the weights are $w_0 = 0$ and $w_1 = 1$. ($w_0$: the intercept, $w_1$: the weight for $x$).

Calculate the likelihood of this data. Round your answer to 2 decimal places.

0.31

**Incorrect Response**
Notice that the second data point has label -1. So when computing the data likelihood, make sure to use $P(y_2 = -1|x_2, \mathbf{w})$, not $P(y_2 = +1|x_2, \mathbf{w})$.

To compute $P(y_2 = -1|x_2, \mathbf{w})$, first compute $P(y_2 = +1|x_2, \mathbf{w})$ and then subtract it from 1, because

$$P(y_2 = +1|x_2, \mathbf{w}) + P(y_2 = -1|x_2, \mathbf{w}) = 1$$

by the law of total probability.

You may also want to review the video segment "Data likelihood".

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0 / 1 points

5.

Refer to the scenario given in Question 4 to answer the following:

Calculate the derivative of the log likelihood with respect to $w_1$. Round your answer to 2 decimal places.

Enter answer here

**Incorrect Response**

The answer you gave is not a number.

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1 / 1 points

6.

Which of the following is true about gradient ascent? Select all that apply.

- [x] It is an iterative algorithm

**Correct**

- [x] It only updates a few of the parameters, not all of them

**Un-selected is correct**

- [x] It finds the maximum by “hill climbing”

**Correct**

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