Congratulations! You passed!

Next Item

1 / 1 points

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

- True
- False (selected)

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 (selected)

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 (selected)

Correct

1 / 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.

0.23

Correct Response

$$P(y_1 = +1|x_1, w)P(y_2 = -1|x_2, w)P(y_3 = +1|x_3, w)P(y_4 = +1|x_4, w)$$
$$= \frac{1}{1+e^{-2.5}} \frac{e^{-0.3}}{1+e^{-0.3}} \frac{1}{1+e^{-2.8}} \frac{1}{1+e^{-0.5}}$$
$$= 0.230765\cdots$$

1 / 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.

0.37

Correct Response

$$\frac{\partial \ell(\mathbf{w})}{\partial \mathbf{w}_1} = \sum_{i=1}^{4} h_1(\mathbf{x}_i)\Big(\mathbf{1}[y_i = +1] - P(y_i = +1|\mathbf{x}_i, \mathbf{w})\Big)$$
$$= 2.5\left(1 - \frac{1}{1+e^{-2.5}}\right) + 0.3\left(0 - \frac{1}{1+e^{-0.3}}\right)$$
$$+ 2.8\left(1 - \frac{1}{1+e^{-2.8}}\right) + 0.5\left(1 - \frac{1}{1+e^{-0.5}}\right)$$
$$= 0.366591\cdots$$

1 / 1 points

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

- [x] It is an iterative algorithm

Correct

- [ ] 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