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Practice quiz: The problem of overfitting

Latest Submission Grade 100%

1. Which of the following can address overfitting? 1 / 1 point

- [x] Apply regularization

  Correct
  Regularization is used to reduce overfitting.

- [x] Select a subset of the more relevant features.

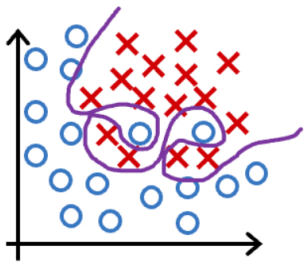
  Correct
  If the model trains on the more relevant features, and not on the less useful features, it may generalize better to new examples.

- [x] Collect more training data

  Correct
  If the model trains on more data, it may generalize better to new examples.

- [ ] Remove a random set of training examples

2. You fit logistic regression with polynomial features to a dataset, and your model looks like this. 1 / 1 point



What would you conclude? (Pick one)

- ( ) The model has high bias (underfit). Thus, adding data is, by itself, unlikely to help much.
- ( ) The model has high variance (overfit). Thus, adding data is, by itself, unlikely to help much.
- (•) The model has high variance (overfit). Thus, adding data is likely to help
- ( ) The model has high bias (underfit). Thus, adding data is likely to help

Correct
The model has high variance (it overfits the training data). Adding data (more training examples) can help.

3. 1 / 1 point

Regularization

$$\min_{\vec{w},b} J(\vec{w},b) = \min_{\vec{w},b} \left[\overbrace{\frac{1}{2m}\sum_{i=1}^{m}\left(f_{\vec{w},b}(\vec{x}^{(i)}) - y^{(i)}\right)^2}^{\text{mean squared error}} + \overbrace{\frac{\lambda}{2m}\sum_{j=1}^{n} w_j^2}^{\text{regularization term}} \right]$$

Suppose you have a regularized linear regression model. If you increase the regularization parameter λ, what do you expect to happen to the parameters $w_1, w_2, \ldots, w_n$?

- (•) This will reduce the size of the parameters $w_1, w_2, \ldots, w_n$
- ( ) This will increase the size of the parameters $w_1, w_2, \ldots, w_n$

Correct

Regularization reduces overfitting by reducing the size of the parameters $w_1, w_2, \ldots w_n$.