Ridge Regression

9 questions

1 point

1.
Which of the following is NOT a valid measure of overfitting?

- ○ Sum of parameters (w1+w2+...+wn)
- ○ Sum of squares of parameters (w1^2 + w2^2 + ... +wn^2)
- ○ Range of parameters, i.e., difference between maximum and minimum parameters
- ○ Sum of absolute values of parameters (|w1| + |w2| + ... + |wn|)

1 point

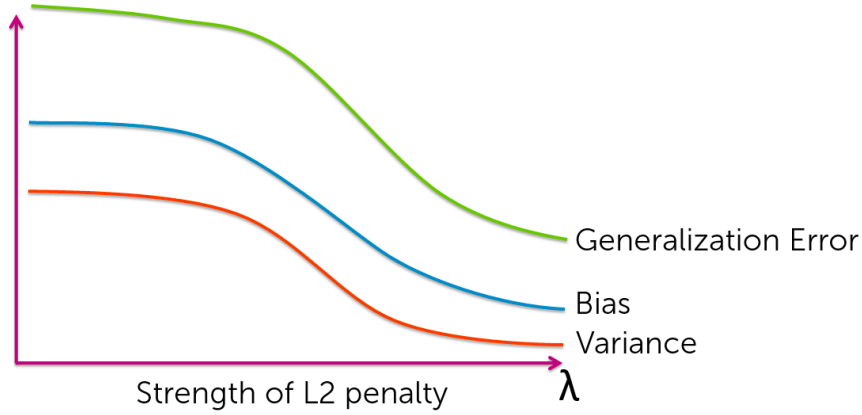
2.
In ridge regression, choosing a large penalty strength λ tends to lead to a model with (choose all that apply):

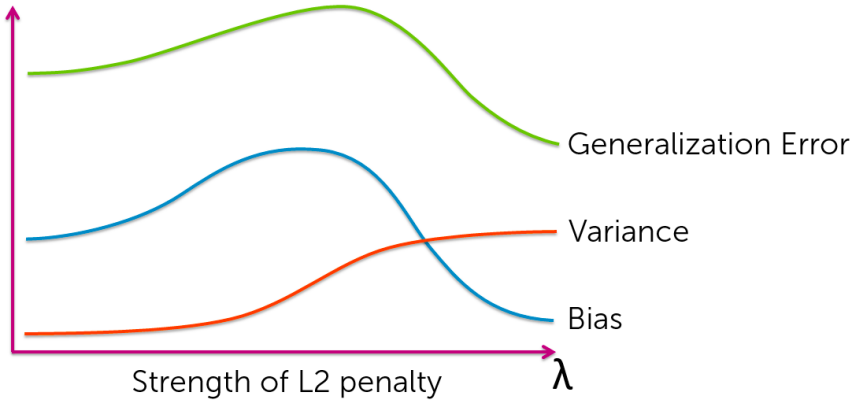
- ☐ High bias
- ☐ Low bias
- ☐ High variance
- ☐ Low variance

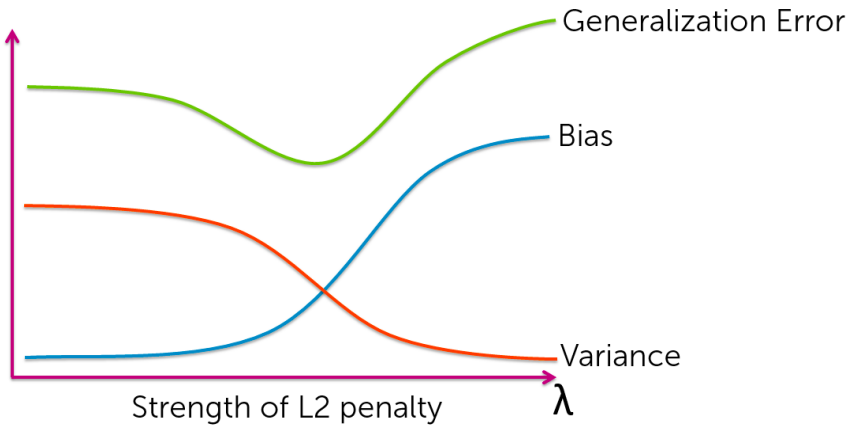
1 point

3.

Which of the following plots best characterize the trend of bias, variance, and generalization error (all plotted over λ)?







1 point

4.

In ridge regression using unnormalized features, if you double the value of a given feature (i.e., a specific column of the feature matrix), what happens to the estimated coefficients for every other feature? They:

- Double
- Half
- Stay the same
- Impossible to tell from the information provided

1 point

5.

If we only have a small number of observations, K-fold cross validation provides a better estimate of the generalization error than the validation set method.

- True
- False

1 point

6.

10-fold cross validation is more computationally intensive than leave-one-out (LOO) cross validation.

- True
- False

1 point

point

7.

Assume you have a training dataset consisting of N observations and D features. You use the closed-form solution to fit a multiple linear regression model using ridge regression. To choose the penalty strength λ, you run leave-one-out (LOO) cross validation searching over L values of λ. Let Cost(N,D) be the computational cost of running ridge regression with N data points and D features. Assume the prediction cost is negligible compared to the computational cost of training the model. Which of the following represents the computational cost of your LOO cross validation procedure?

- L* N * Cost(N,D)
- L* N * Cost(N-1,D)
- L* D * Cost(N-1,D)
- L* D * Cost(N,D)
- L* Cost(N-1,D)
- L* Cost(N,D)

---

1 point

8.

Assume you have a training dataset consisting of 1 million observations. Suppose running the closed-form solution to fit a multiple linear regression model using ridge regression on this data takes 1 second. Suppose you want to choose the penalty strength λ by searching over 100 possible values. How long will it take to run leave-one-out (LOO) cross-validation for this selection task?

- About 3 hours
- About 3 days
- About 3 years
- About 3 decades

---

1 point

9

9.

Assume you have a training dataset consisting of 1 million observations. Suppose running the closed-form solution to fit a multiple linear regression model using ridge regression on this data takes 1 second. Suppose you want to choose the penalty strength λ by searching over 100 possible values. If you only want to spend about 1 hour to select λ, what value of k should you use for k-fold cross-validation?

- k=6
- k=36
- k=600
- k=3600

1 question unanswered

Submit Quiz