



Foundations of Machine Learning (CS 725)

FALL 2024

Lecture 7:

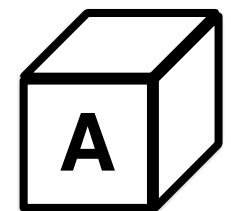
- Logistic Regression

Instructor: Preethi Jyothi

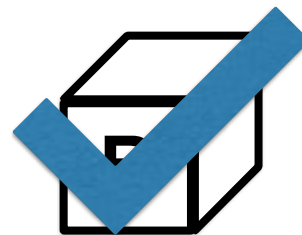
Question 1

Consider a ridge regression estimator: $\arg \min_{\mathbf{w}} ||\mathbf{y} - \mathbf{X}\mathbf{w}||_2^2 + \lambda ||\mathbf{w}||_2^2$

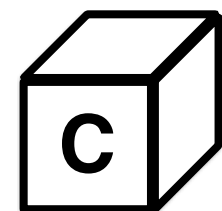
Compared to an unregularized linear regression estimator, which of the following can we say with most certainty about the ridge regression estimator when λ is increased?



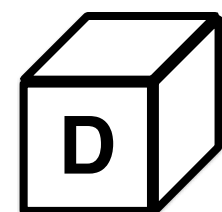
Results in lower bias



Results in lower variance



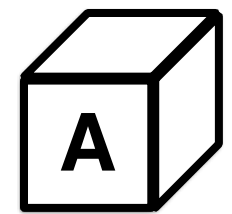
Results in higher bias Note: Bias might increase but lower variance is more likely if forced to pick one option



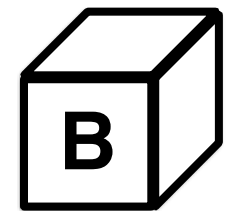
Results in higher variance

Question 2

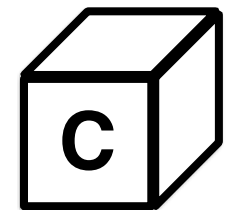
Suppose you have 1-D data generated by a polynomial of degree 5. Say you have a regression model with polynomial basis functions of degree at most 15. Which of the following statements are true?



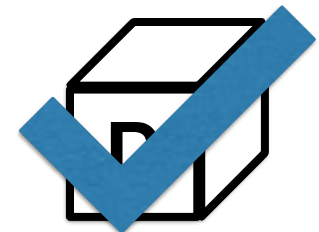
Bias will be high and variance will be low



Bias will be low and variance will be low



Bias will be high and variance will be high



Bias will be low and variance will be high