

MITx: 14.310x Data Analysis for Social Scientists

Heli



Bookmarks

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Properties of Kernel Regression - Quiz

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Question 1

1/1 point (graded)

Which of the following is true in the context of kernel regressions? (Select all that apply)

- a. As bandwidth goes to 0, bias goes to 0.
- b. As your sample size increases, your variance decreases.
- c. As your bandwidth increases, your variance increases.
- ✓ d. As your sample size decreases, bias increases, holding your bandwidth fixed.
- e. As your bandwidth decreases, your variance increases, .



Explanation

As Professor Duflo explained in class, there are 3 things to keep in mind for kernel regressions:

- Module 5: Moments of a Random Variable,
 Applications to Auctions,
 Intro to Regression
- Module 6: Special
 <u>Distributions, the</u>
 <u>Sample Mean, the</u>
 <u>Central Limit Theorem,</u>
 and Estimation
- Module 7: Assessing and Deriving Estimators -Confidence Intervals, and Hypothesis Testing
- Module 8: Causality,
 Analyzing Randomized
 Experiments, &
 Nonparametric
 Regression

Causality

Finger Exercises due Nov 21, 2016 at 05:00 IST

<u>Analyzing Randomized</u> <u>Experiments</u>

Finger Exercises due Nov 21, 2016 at 05:00 IST

- 1. As your bandwidth decreases, your bias goes to 0.
- 2. However, there is a trade off between bias and variance: For a fixed sample size, decreasing your bandwidth will lead to over fitting (high variance).
- 3. As your sample size increases, your precision increases, so essentially you can reduce your bandwidth to decrease bias, at a lower cost in terms of variance.

Given this, A is clearly correct and B immediately follows from the 3rd point above. C says the opposite of B, therefore must be wrong. As you reduce your sample size, you will need to reduce your bandwidth in order to hold your bias fixed. A and E are both saying the same thing, which is consistent with the second point. The reason C is incorrect, is that for a fixed sample size there is a trade-off

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

Question 2

1.0/1.0 point (graded)
Why do we use cross-validation?

- a. To optimize the trade-off between bias and variance.
- b. To select the optimal bandwidth.
- c. To minimize mean squared error, which takes into account both bias and variance.

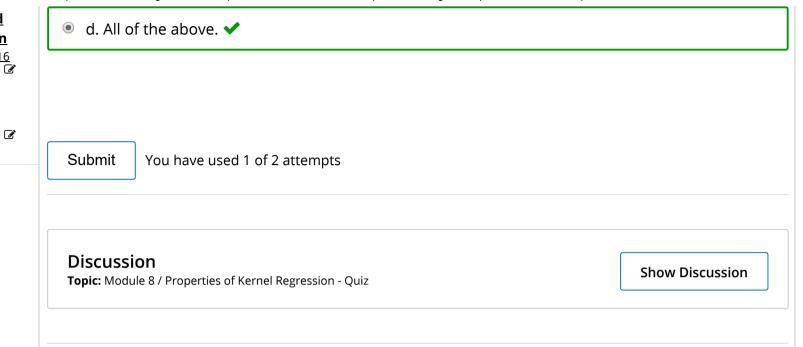
Use of Randomization and **Nonparametric Regression**

Finger Exercises due Nov 21, 2016 at 05:00 IST

Module 8: Homework

Homework due Nov 14, 2016 at 05:00 IST

- Module 9: Single and Multivariate Linear Models
- ► Exit Survey



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