

<u>Course</u> > <u>Ch7 Moving Beyond Linearity</u> > <u>Chapter 7 Quiz</u> > Chapter 7 Quiz

Chapter 7 Quiz

7.Q.1

1/1 point (graded)

Suppose we want to fit a generalized additive model (with a continuous response) for y against X_1 and X_2 . Suppose that we are using a cubic spline with four knots for each variable (so our model can be expressed as a linear regression after the right basis expansion).

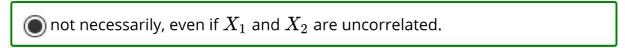
Suppose that we fit our model by the following three steps:

- 1) First fit our cubic spline model for y against X_1 , obtaining the fit $\hat{f}_1\left(x\right)$ and residuals $r_i=y_i-\hat{f}_1\left(X_{i,1}\right)$.
- 2) Then, fit a cubic spline model for r against X_2 to obtain $\hat{f}_{|_2}(x)$.
- 3) Finally construct fitted values $\hat{y}_i = \hat{f}_1\left(X_{i,1}\right) + \hat{f}_2\left(X_{i,2}\right)$.

Will we get the same fitted values as we would if we fit the additive model for y against X_1 and X_2 jointly?

yes, no matter what		

igcap only if X_1 and X_2 are uncorrelated





Explanation

If X_1 and X_2 are uncorrelated, and we are only fitting a linear regression (only linear terms for X_1 X_2) then this method would work. However, even if X_1 and X_2 are uncorrelated, the nonlinear basis functions might be.



1 Answers are displayed within the problem

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