

Homework 3: Due May 8

1. Suppose \mathbf{B} is an $n \times (K + 4)$ matrix containing the evaluation of the cubic B-splines basis functions with K interior knots evaluated at the N values of X . Let \mathbf{C} be the $2 \times (K + 4)$ matrix containing the second derivatives of the basis function at the boundary points x_1 and x_n . Show how to derive \mathbf{N} from \mathbf{B} , an $n \times (K + 2)$ basis matrix for the natural cubic splines with the same interior knots and boundary knots at the extremes of X . First do the math and then describe how you would do this using R.
2. Write a one page summary describing your final project. Describe the data set, the scientific question, its significance, and a brief summary of the analyses you plan to carry out.