Advanced Bayesian Methods: Theory and Applications in R

05-Smoothing - Exercises

In this exercise we try to implement a Bayesian P-spline model from scratch in R. Therefore, review the slides for Gibbs sampling and the generic MCMC sampling scheme.

1. Implement the function

   ```
   splineMCMC(x, y, k = 10, n.iter = 1200, burnin = 200, ...)
   ```

   where `x` is the covariate and `y` the response. Argument `k` controls the number of basis functions used to estimate the model. The `"..."` argument can be used to specify further hyperparameters.

2. Also implement a predict method.

3. Finally test your function using the `mcycle` dataset in the **MASS** package.