ASM Practice

Smoothing and regression splines

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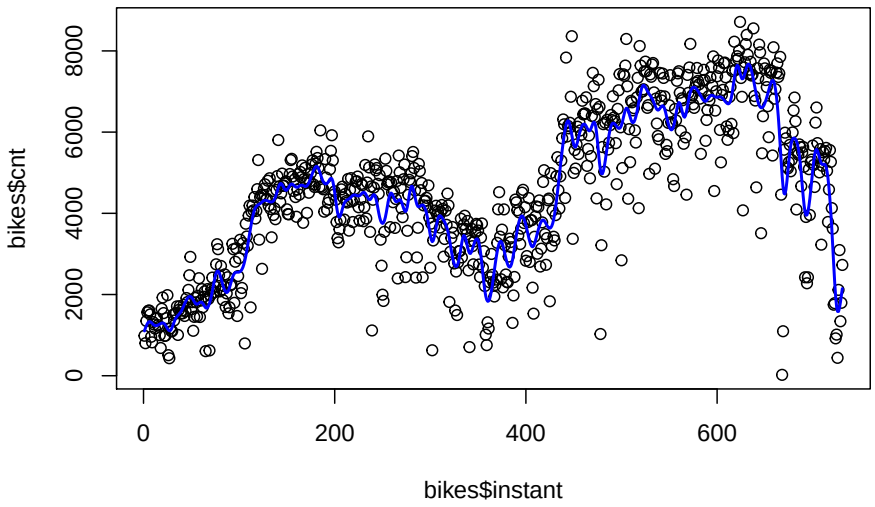
Estimate the regression function m(instant) of cnt as a function of instant using a cubic regression splines estimated with the R function smooth.splines and choosing the smoothing parameter by Generalized Cross Validation.

a) The chosen Smoothness penalization hyperparameter λ by GCV is 1.0050377×10^{-7}.

b) The corresponding equivalent number of degrees of freedom of the spline regression's linear estimatoris 93.3409051.

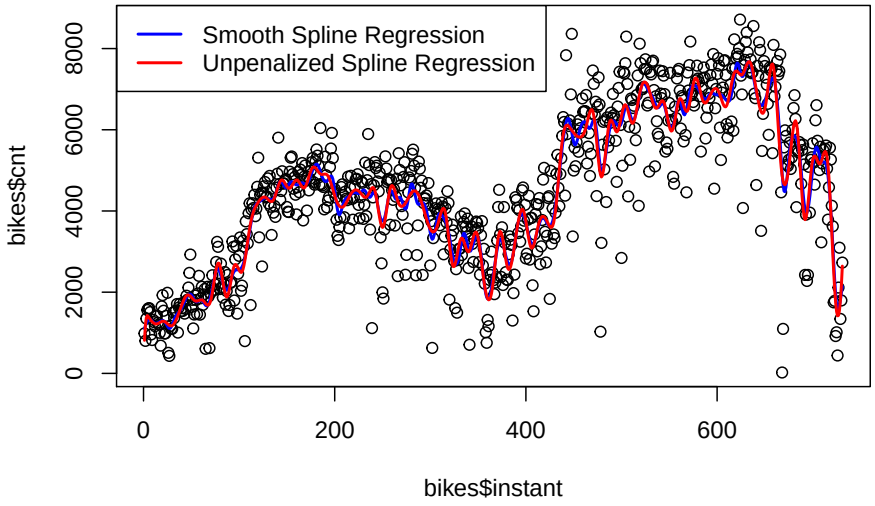
c) 140 knots were used.

d) We show a scatterplot of the data points with the fitted spline regression:



e) Estimate now m(instant) by unpenalized regression splines combining the R functions bs and lm, using the knots where n.knots is the previous value of df minus 4.

f) Plot the scatter plot with the different spline regressions


Smooth Spline Regression
Unpenalized Spline Regression
bikes$cnt
0
2000
4000
6000
8000
0
200
400
600
bikes$instant