Stochastic Models (Online)

Assignment 2

Set: October 11th, 2016.
Due: October 26th, 2016

Data

We are interested in studying the relationship between "Health expenditure per capita" and "GDP per capita" across countries in the world.

Data can be downloaded from the World Bank using the WDI package in R. A code snippet for this is given as follows:

```
# Load the World Development Index package (WDI)
library(WDI)

# Select the indices to be included in the study
# ind1 is the index for Health expenditure per capita
# ind2 is the index for GDP per capita
# ind3 is Life expectancy at birth

ind1 <- "SH.XPD.PCAP.PP.KD"
ind2 <- "NY.GDP.PCAP.KD"
ind3 <- "SP.DYN.LE00.IN"
```

```
# You can look for other indices using the WDIsearch() command.
WDIsearch(string="debt",field="name")

# Download the data from 2010 using the WDI() command
ind <- c(ind1,ind2,ind3)
dat <- WDI(indicator=ind,start=2010,end=2010)

# Store data values only and remove missing values
dat <- dat[,4:6]
dat <- dat[!apply(is.na(dat),1,any),]
colnames(dat)<-c("Health","GDP","Life")
```

Assignment

1. Compare the different smoothing methods for finding the relationship between Health expenditure and GDP (only).

2. Does using a generalized additive model with GDP and Life Expectancy as covariates improve the model performance?

Hint: You may get a more satisfactory model if you model the logarithm of Health Expenditure instead of the data in its original form.

Write a concise report on your model and results. Your code can be included in your report. This must be submitted as a single file (pdf, Word, or similar).