36-463/663: Multilevel & Hierarchical Models
Fall 2016
HW03 – Due Tue, 19 Sept 2016

Announcements

- Homework due as a pdf on Blackboard, by 11:59pm Tuesday.
- Reading in Gelman & Hill (G&H):
  - This homework covers G&H Chapters 3–4.
  - Starting Thursday we will be looking at G&H Chapters 5–6.

Exercises

1. Read and try out the ideas in G&H Chapter 3. Note that code and data sets are available at the class website under "Week03". Then do and turn in:

   (a) G&H Chapter 3, #1. The "pyth" folder for this problem is available at http://www.stat.cmu.edu/~brian/463/hw03

   (b) G&H Chapter 3, #4. The "child-iq" folder for this problem is available at http://www.stat.cmu.edu/~brian/463/hw03

   For part (a) *in addition* to fitting the linear model and answering the questions posed in part (a), *I also want you to check for a nonlinear relationship*, by binning the x-variable as in lecture 06. (After you do this you can check your work using `loess` if you like.)

   When you finish all this, go on and do the other parts of the problem.

   (c) G&H Chapter 3, #5. The "beauty" folder for this problem is available at http://www.stat.cmu.edu/~brian/463/hw03. Examples of analyses are available at http://www.stat.columbia.edu/~gelman/arm/examples, *but please do not look at these other analyses until you turn this assignment in.*

2. Read and try out the ideas in G&H Chapter 4. Note that the code and data sets are available at the class website under "Week03". Then do and turn in:

   (a) G&H Chapter 4, #1. Note that R is not needed for this problem.

   (b) G&H Chapter 4, #4. The "pollution" folder for this problem is available at http://www.stat.cmu.edu/~brian/463/hw03

   (c) G&H Chapter 4, #5. Note that R is not needed for this problem.