Class 1 Homework

October 17, 2017

For the first week's homework, the goal is just for you to practice manipulating and analysing data in R, and producing a quick report in R Markdown. Don't worry if you get stuck - try your best, search online for advice, and if you get stuck please please just send me an email (jonnyphillips@gmail.com) and I will try to help. The aim is to help you get up to speed, not to waste your time!

Preparatory Tasks:

1. Download the 'Municipal Atlas' of Human Development Indicators (IDHM) for Brazil from http://www.atlasbrasil.org.br/2013/en/download/base/
2. Open this file and save the 'UF 91-00-10' sheet as a .csv file.
3. Open a new R markdown (.Rmd) file.
4. Give your document a title, author, date etc.
5. In an R code chunk, open the IDHM CSV file.

The following analysis tasks should be included in your report - calculations in R code chunks and answers to the questions in the R markdown text. Remember that any numerical answers or outputs you generate must be *FULLY* calculated within your R markdown file. Note you can refer to the 'Siglas' sheet of the downloaded excel file for details on each of the variables in the dataset.

Analysis Tasks:

1. What is the IDHM of Sao Paulo in 1991? What is the percentage change in Sao Paulo's IDHM between 1991 and 2010?
2. Produce a clear table of the IDHM by state and by year (you might need to rearrange the data - google if you get stuck).
3. Which state has made the greatest absolute gains in the IDHM between 1991 and 2010?
4. Produce a chart showing how the IDHM has changed over time in four states: Sao Paulo, Rio Grande do Norte, Roraima and Mato Grosso.
5. What is the correlation between state population (variable POP) and IDHM in 2010?
6. Do you think that a higher state population causes a higher state IDHM? Why?
7. What is the correlation between state education (for example variable I_ESCOLARIDADE) and IDHM in 2010?
8. Do you think that a higher state education causes a higher IDHM? Why?
9. What is the correlation between state education (variable I_ESCOLARIDADE) and state population (variable POP) in 2010?
10. How does your answer to (9.) affect your answer to (6.)?
11. Can you think of any methodology (field experiment, natural experiment, observational study etc.) for testing whether an increase in population causes a higher municipal IDHM?

Once you have a short report (and it should be short, just 2-3 pages max), knit your R markdown file into a PDF and submit both the R markdown file and the PDF.