# Prep Exercise (PE03) Data Cleansing and Munging

### General Instructions

1. For this exercise you will answer all of the questions in this document and turn it in to Blackboard.
2. Review from last week
   1. Make a data frame data.frame( )
   2. Row index of max/min which.max( ) which.min( )
   3. Sort value or order rows sort( ) order( )
   4. Descriptive statistics mean( ) sum( ) max( )
3. Getting Started:
   1. Often, in data science, when you get a dataset, it is not in the format you want. So, you have to use R code to refine the dataset into something more useful. As Chapter 6 of Introduction to Data Science mentions, this is called “data munging.” In this prep exercise, you will read in a dataset from the web and work on that dataset (in a dataframe) so that it can be useful. Once the dataset is prepped (and checked for validity) you will use the dataframe in your homework to explore the distribution of a variable within the dataset.
   2. IFF (if and only if) the web is not available to read we have a copy of the dataset in BB for you to use.

### Prep Exercise

1. **Getting the Data**
2. Use R code to read directly from a URL on the web. *Hint: use read.csv and url() to read the file from the web*.
3. Store the dataset into a new dataframe, called dfStates. Hint: Use stringsAsFactors=FALSE.
4. The URL is:

<https://www2.census.gov/programs-surveys/popest/tables/2010-2011/state/totals/nst-est2011-01.csv>

1. **Clean Up the Dataframe**
2. Use View( ), head( ), and tail( ) to examine the data frame. Briefly describe what each of the commands show you about a dataframe in general and as it relates to this dataset.

**The View command displays the dataframe in a tabular format. It shows the attributes of dfStates dataframe along with its instances in a table which is unorganized.**

**head command gives the first few rows of the dataframe. It shows the first six rows of dfStates dataframe in a disorganized manner.**

**tail command gives the last few rows of the dataframe. It shows the last six rows of dfStates dataframe in a disorganized manner.**

1. Remove unneeded rows by using the minus sign in the row selector of the [ , ] subsetting method. *Hint: Start by removing extra rows that appear* ***at the end*** *of the data set.*
2. Use the dim() command to make sure there are exactly 51 rows (one per state + the district of Columbia).
3. Remove unneeded columns by using the minus sign in the column selector of the [ , ] subsetting method.
4. Use the dim() command to make sure there are precisely five columns.
5. **Let’s add some meaningful metadata!**
6. Rename the columns with the following names: stateName, Census, Estimated, Pop2010, Pop2011. *Hint: use colnames( )*
7. **More cleansing!** 
   1. Use gsub(",", "", vectorName) to remove the commas from each column of numeric data. Place the converted results back into the data frame.
   2. Use as.numeric( ) to coerce each numeric data column into numbers. Place the converted results back into the data frame
   3. Calculate the mean of the 4 numeric variables and fill in the table below:

|  |  |
| --- | --- |
| **Census** | **6053834** |
| **Estimated** | **6053834** |
| **Pop2010** | **6065298** |
| **Pop2011** | **6109645** |

1. **List any additional resources you used here.**
2. **Be sure to save your R file as this will become the starting code for your homework.**

***You must submit all Prep Exercises to blackboard prior to the deadline specified for each assignment.*** PE assignments are due on the evening prior to the lecture class. Late PE assignments will not be accepted for credit.

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