**Week 4 assignment**

**Before class on Friday, Sept. 18:**

* Open *RStudio*, which you downloaded last week for the weekly assignment, and check in the list of *Packages* in the lower righthand window for the packages *ggplot2* and *plyr*.
* If either one is missing, use *Install* (in that window) to install them.
* Download the file *week4.zip* from the Assignments page where you got these instructions, and unzip it to get the file *luganda.xlsx*, a set of 242 F1 and F2 measurements for vowels in Luganda, a language of Uganda, as produced by one adult female speaker. A copy of the file in text format (*luganda.txt*) is included in case you can’t open an Excel file.
* Have these files and packages downloaded into your computer *before* class on Friday.

**In class on Friday, Sept. 18: An exercise in graphing**

(1) Open RStudio.

(2) In the upper righthand window within *RStudio*, select *Import Dataset*.

(3) Use *Browse* to select the file *luganda.xlsx* (or *luganda.txt*) on your computer. Click *Import*.

(4) Copy the following text after the prompt (>) in the lower lefthand (*Console*) window, and hit *Return*.

attach (luganda)

(5) In the lower righthand window, under *Packages*, select the following two packages by clicking in the corresponding box: *ggplot2* and *plyr*. A checkmark appears in the box, and a line acknowledging the opening appears in the *Console* window.

(6) Copy the following text after the prompt (>) in the lower lefthand (*Console*) window, and hit *Return*.

ggplot (luganda, aes (x = f2, y = f1, label = vowel, col = vowel)) + geom\_text(size = 3) + ylim (900, 200) + xlim (3000,800) + xlab ("F2 (Hz)") + ylab ("F1 (Hz)") + ggtitle ("F1 and F2 by vowel")+theme\_bw()+ scale\_color\_manual (name = "Vowel", values = c("red", "blue", "green4", "black", "purple"), guide =FALSE)

(7) The last command produces in the lower righthand window a scatterplot of F1 and F2 values for all the vowels in the sample. At the top of that window select *Export > Save as image*…

(8) Select the folder on your computer with your homework materials as the *Directory*, and type in *scatterplot* as the *File name*. Click *Save*.

(9) Copy the following text after the prompt (>) in the lower lefthand (*Console*) window, and hit *Return*.

vowel1 = ddply(luganda, c ("vowel"), summarize, N = length ("vowel"), meanf1 =

mean (f1), sdf1 = sd(f1), meanf2 = mean (f2), sdf2 = sd(f2))

(10) Copy the following text after the prompt (>) in the lower lefthand (*Console*) window, and hit *Return*.

vowel1

(11) A table of mean F1 and F2 values with standard deviations appears in response. Copy this to a document on your computer.

* One way to do this is to double-click on vowel1 in the upper righthand window, sending a copy to the upper lefthand window. Select the new table, then Print > Save as PDF.
* Alternatively, select the whole table in the Console window, including the row of column labels, and copy it into a word-processing or text file on your computer. Save this document with the table.

(12) Copy the following text after the prompt (>) in the lower lefthand (*Console*) window, and hit *Return*.

ggplot (vowel1, aes (x = meanf2, y = meanf1, label = vowel)) + geom\_text(size = 6) + ylim (900, 200) + xlim (3000,800) + xlab ("F2 (Hz)") + ylab ("F1 (Hz)") + ggtitle ("Mean F1 and F2 by vowel")+theme\_bw()

(13) The last command produces in the lower righthand window a scatterplot of mean F1 and F2 values for all the vowels in the sample. At the top of that window select *Export > Save as image*…

(14) Select the folder on your computer with your homework materials as the *Directory*, and type in *mean*\_*scatterplot* as the *File name*. Click *Save*.

**By 6 PM on Friday, Sept. 18, submit the following through Canvas:**

A single PDF document, including the following:

* The table of measurements *vowel1*
* The graph *scatterplot*
* The graph *mean\_scatterplot*
* An answer to the following question: How do the 5 vowels of Luganda differ in F1 and F2 in this sample?
* An answer to the following question: What information about Luganda vowels can be found in the graph *scatterplot* that cannot be found in the graph *mean\_scatterplot*?