**BIO 206: Biostatistics Spring 2021 Richardson**

Assignment 3: Questions from Chapter 2 “Displaying Data”

(64 pts)

**Due Wed, April 7**

* Please type your answers. Remember to put your name and the number and title of the assignment on the first page. Upload to the submission folder on D2L.
* Make sure to answer every question within a problem for full credit.
* For practice problems, please write an answer in your own words before checking your answer against the solutions in the back of the book. Then, compare the solution to your answer. If your answer wasn't correct, don't change it--write about how the solution in the book differed from your answer and why it's correct. In other words, show evidence that you are thinking independently and learning. In this way, you can get full credit even if you originally didn't have the correct answer.
* Draw the graphs by hand on graph paper, not using Excel, for this assignment. Copies of blank graph paper are on D2L in the folder called “Blank graph paper”. Take a photo and upload to the same submission folder as for the rest of the assignment. If you don’t have a printer, you can use a program such as Excel or Powerpoint to draw the graphs. On graphs, include:
  + Your name
  + The assignment and number to the problem
  + Include labels on the axes.
  + Include units. Examples of units: cm or sec.
  + Above or below the graph, write a figure legend that describes what data are in the graph. Include the sample size in the legend. See Endres and Lohmann (2012) fig 2 and fig 3 for examples. This article is in the folder “Assignments”. Reading the whole article won’t be part of this course—just look at the design of the graphs and legends. These graphs have standard error bars, which are not part of histograms.
  + At the end of the figure legend, write in parentheses the names of the authors and year published for the source of the data—you don't want to represent the data as your own. Example of citation: (data from Cratsley and Lewis (2003)). The authors for the data are listed in problems. It's really important to make it clear that data aren't yours if you're showing them to other people.
* Data for the graphs are in the folder “Datasets for Assignments” under Content on D2L.
* Assignments turned in after the beginning of class are late unless you have an excused absence.

Alternative methods to use to create graphs for this chapter—See D2L>>Content>>”Graphing with Excel” to see YouTube tutorials for the first two methods.

* Create a histogram of a frequency distribution using Google Sheets. Use Google docs to answer questions and paste the graph from Google Sheets to the document.
* Creating a frequency histogram in Excel 2016 and later, **for Windows only** <https://spreadsheeto.com/histogram-excel/> The directions may vary slightly with version of Excel.
* Use pdf of blank graph paper from folder on D2L to create a drawing of a graph in Powerpoint:

1) Open PowerPoint to create a new slide.  
2) Then on that slide go to Insert > Picture > Picture from file. From here, navigate to the .jpg or .pdf, and that is added to the slide, and add that..   
3) Then resize the graph.  
4) To draw on it, go to Draw and select a drawing tool, then draw over the graph.  
5) After you are done they save the file. They can go to File > Export > [pdf, or jpeg] > [save current slide only, or save every slide] > Export.

6) Insert page or image into the document of the assignment that you are writing

* Directions for Excel for Mac 2016 or later:

How to Modify Excel for Mac 2016 or later to be able to create histograms of frequency distributions

Follow these steps to load the Analysis ToolPak in Excel 2016 for Mac (or Excel from current Office 365 for Mac in 2021.

1. Click the **Tools** menu, and then click **Excel Add-ins**.
2. In the **Add-Ins available** box, select the **Analysis ToolPak** check box, and then click **OK**.
   1. If **Analysis ToolPak** is not listed in the **Add-Ins available** box, click **Browse** to locate it.
   2. If you get a prompt that the Analysis ToolPak is not currently installed on your computer, click **Yes** to install it.
   3. Quit and restart Excel.

Now the **Data Analysis** command is available on the **Data** tab.

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How to change bin number/width in a histogram in Excel for Mac (Office 2020)

Select your histogram chart by clicking on one of the bins (columns). The options to modify the bins will be available under the histogram tab in the Format Data Series panel on the right. So nothing to do with 'Format axis', which is how Excel for Windows does it.

Practice Problems

2 all (9 pt) See directions above for methods to sketch a graph. You don’t need numbers on the graph but you can use them to create the graph of the shapes requested. Copy and paste into the document of the rest of your assignment. Label the axes. Then, type your answers to the questions.

4 all 2 all (9 pt) Make the graphs using predictions of what you think that you would see. Label the axes. Copy and paste into the document of the rest of your assignment. After that, type your answers to the questions.

11 a-b (5pt each; 10 pt. total)

Assignment Problems

19a (6 pt) Draw graph using one of the methods above. Make all of the bins the same width on the x-axis. Data are in a file in D2L>Content>Datasets for Assignments.

19b through d (5 pt) Explain.

23 all (6 pt) Explain.

26b (2 pt) If you made this graph, which variable would be the explanatory variable? Why? (You don’t need to make the graph.)

28 all (12 pt) Remember to identify types.

30a (2pt)

36 a (1 pt)

36 b (1 pt)

36 c (1 pt)

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Extra question: At the end of your assignment, please write “Number of hours I spent on this homework:” and add an estimate. Don’t include time that you spent reading the chapter. This number won’t affect your grade.