Homework #4 (Descriptive Statistics)
PSCI 2300 - Spring 2018 (Dr. Hensel)

This homework assignment is due at the beginning of class (i.e., before lecture starts) on **Friday, March 23**. Any work turned in after lecture begins that day (even if only a few minutes into class) will be assessed a late penalty. Also, note that all work must be your own -- students found to have copied their answers from other students (or to have had their answers copied by other students) will receive automatic zero grades on this assignment, and may face further disciplinary action.

Be sure to show your work wherever relevant; correct answers that do not show their work will only receive half credit.

For the first four questions, you are to analyze the following data series. A professional golfer, Phil Mickelson, has recorded the following scores in his last eight rounds at professional tournaments (the 2018 Genesis Open and 2018 World Golf Championships - Mexico Championship):

70 71 67 68 69 68 65 66

1. What is his modal golf score (the mode) over this time period? Explain how you reached this conclusion. Briefly interpret what this value tells you (i.e., explain the interpretation of this value in 1-2 sentences).

2. What is his median golf score over this time period? Explain how you reached this conclusion. Briefly interpret what this value tells you (i.e., explain the interpretation of this value in 1-2 sentences).

3. What is his mean golf score over this time period? Be sure to show your work. Briefly interpret what this value tells you (i.e., explain the interpretation of this value in 1-2 sentences).

4. What is the standard deviation of these golf scores? Be sure to show your work. (*Remember, you will need to calculate each score's deviation from the mean, square the deviations, sum the squared deviations, divide by N to find the variance, and take the square root to find the standard deviation*)

The remaining questions involve basic calculations using data on the 50 U.S. states compiled by the author of our textbook, which is available from the same portion of the class web site where you access the homework assignments. You will analyze this data using SPSS statistical software (or potentially PSPP, the free alternative to SPSS, although I have not tested this on PSPP yet besides making sure that it is capable of opening .sav SPSS data files). The last page of this homework assignment sheet provides instructions for using SPSS.

<u>Nominal-level Variables</u>

5. Using SPSS, produce a frequency table for the variable **region** (the region of the country where each survey respondent lives).

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

6. Using SPSS, produce a bar graph for the variable **region**.

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

<u>Ordinal-level Variables</u>

7. Using SPSS, produce a frequency table for the variable **Gun_rank3** (the respondent's attitude about more or less gun restrictions).

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

8. Using SPSS, produce a bar graph for the variable **Gun_rank3**.

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

Interval/Ratio-level Variables

9. Using SPSS, calculate the measures of central tendency and dispersion for the variable **defexpen** (Federal defense expenditures per capita in the state). This should include the following measures: Quartiles, Mean, Median, Mode, Standard deviation, and Range.

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

10 Using SPSS, produce a histogram for the variable **defexpen**.

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

SPSS Instructions for This Assignment

• For more detail about using SPSS, see my SPSS Guidelines and Instructions document that is posted on the class web site. At the time when this assignment was first posted, this SPSS Guidelines document does not include any instructions for using PSPP, although such instructions will be added when the instructor has time to investigate it more completely.

<http://www.paulhensel.org/Teaching/spss.pdf>

• Download the data set that you will need for this assignment (perhaps to a flash drive if you are not working on your own personal computer). From a computer that has SPSS, open this data file in SPSS, using one of the following two options:

--Double-click on the data set, which should automatically open SPSS and then open the data set in SPSS. [*Note that this option does not appear to work in PSPP*]

--Open SPSS manually by clicking on the icon or on an alias/shortcut to it. Once it is open, select and open the data set using **File > Open** from the menu bar at the top of the screen.

• Once the data set opens in SPSS, you should see a spreadsheet with a list of variable names across the top. It is advisable to produce a list of variables, so you know what is in the data set. This can be done using either of the following commands:

--DISPLAY DICTIONARY: **File > Display Data File Information > Working File**

--CODEBOOK: **Analyze > Reports > Codebook** [*Note that this option does not appear to work in PSPP*]

Calculating Frequencies

• To calculate the frequency distribution for any variable in the data set, go to **Analyze** > **Descriptive Statistics** > **Frequencies**. This will open a dialog box that allows you to choose one or more variables for analysis.

• Select the variable you want to examine on the left side of this box, push the arrow button in the middle of the screen, and the variable should then appear in the window at the right side of the box; once this happens, click OK. (If you want to remove a variable from the list, select the variable in the right side of

the box, and click the arrow in the middle of the screen.)
• This will give you a frequency table with a variety of frequency-related details for each value of the variable: the frequency count (the number of cases that have this value), the percentage of cases, the valid percentage of cases, and the cumulative percentage of cases.
• Once the output appears in the Output Viewer window, be sure to print it out (or copy and paste it into a word processing document), because you will need to turn this in to get full credit for your assignment.

Producing Bar Graphs and Histograms
• To generate bar graphs/charts, pie graphs/charts, or histograms for any variable in the data set, go to **Analyze > Descriptive Statistics > Frequencies**. This will open a dialog box that allows you to choose one or more variables for analysis.
• Select the variable you want to examine on the left side of this box, push the arrow button in the middle of the screen, and the variable should then appear in the window at the right side of the box; once this happens, click the Charts button and select the correct type of graph/chart and any desired options. (Be sure that the "Chart Values" option is set to Frequencies, not Percentages.) Click the Continue button to go back to the main Frequencies window, and click OK.
• Once the graph displays in the Output Viewer window, be sure to print it out (or copy and paste it into a word processing document), because you will need to turn this in to get full credit for your assignment.

Calculating Central Tendency and Dispersion
• To calculate measures of central tendency and measures of dispersion or variability for any variable in the data set, go to **Analyze > Descriptive Statistics > Frequencies**. This will open a dialog box that allows you to choose one or more variables for analysis.
• Select the variable you want to examine on the left side of this box, push the arrow button in the middle of the screen, and the variable should then appear in the window at the right side of the box; once this happens, click the Statistics button and select the desired statistics that you want to be calculated. For the purposes of this assignment, you should select Quartiles, Mean, Median, Mode, Std. deviation, and Range (all of which we have used in class). Click the Continue button to go back to the main Frequencies window, and click OK.
• Once the output appears in the Output Viewer window, be sure to print it out (or copy and paste it into a word processing document), because you will need to turn this in to get full credit for your assignment.