

Math 8 SPSS Project 1  
due Monday, March 8, 2010

1. This project uses one of the files that comes with our textbook, so to use the files that I have put on the Shared Drive, be sure to go to the Drives folder in the Novell applications and launch the Shared Drive program. Then run SPSS. When it asks you what you would like to do, select More Files, and find the Bears file on the Shared Drive in the Greenwell folder in the Math 8 folder. See p. 773 of our textbook for a description of this data set.

2. Select Analyze-Descriptive Statistics-Descriptives. Move the Measured Weight data under Variables and click OK. Look at the output, and jot down the mean and standard deviation somewhere.

3. You are now going to create three new variables. The first is the weight data with 10 added to each piece of data. In the second, each piece of data is multiplied by 10. The third variable contains the z scores for the Weight data. To do this, select Transform-Compute. Then type var1 under Target variable, moved Measured Weight into the Numeric Expression, and add "+10"; then click OK. Similarly, create  $\text{var2} = \text{weight} * 10$  and  $\text{var3} = (\text{weight} - \text{mean}) / \text{StDev}$  (where you type in the actual values of the mean and standard deviation that you found in step 2).

4. Go to the menu Analyze-Descriptive Statistics-Explore. Put Measured Weight, var1, var2, and var3 under the Dependent List. Under Display, select Both. Then click on Statistics, and make sure Descriptives and Percentiles are checked. Then click Continue. Next, click on Plots, and make sure that Histograms is checked. Leave Stem-and-leaf unchecked. Under Boxplots, make sure that Factor Levels Together is selected. Click Continue, and then OK. This should create lots of statistics and graphs.

5. Select Graphs, and then Chart Builder. Select Histogram, and then drag the histogram picture into the Chart area. Drag Measured Weight into the X-axis area. In the Element Properties area, click Set Parameters. Under Bin Sizes, select Custom. Make the Custom value for the anchor 0 and under Custom Bin Size, make the custom interval width 50. Then click Continue, then Apply, then OK. Similarly make a histogram for var1, making the anchor 10 and the interval width 50. Then make a histogram for var2, making the anchor 0 and the interval width 500.

6. Print the output of what you have done. Be sure, when the Print box comes up, to select "All visible output" under Print Range.

7. Select Exit (under the File menu), and don't save anything.

9. Hand in:

- a) the computer output;
- b) your answers to the questions below.

Questions for you to answer, based on the SPSS output.

- 1) How are the mean, median, and standard deviation affected when the same constant is added to every value in a data set?
- 2) How are the mean, median, and standard deviation affected when every value in a data set is multiplied by the same constant?
- 3) When the data is converted into z scores, what happens to the mean and the standard deviation?
- 4) When the data is converted into z scores, how do the values of the minimum and maximum compare with what you know about z scores from the text?
- 5) Notice that the first set of histograms don't all look alike, but that the second set do. Using the second set, explain how the shape of the distribution is affected if a constant is added to each value in a data set or when each value is multiplied by a constant. Also explain what is going on with changing the anchor and interval width. (For extra credit, go back and tweak the histogram for var3 so it looks just like the histogram for weight, var1, and var2.)
- 6) Write on the boxplot for the weight data, showing how the minimum, maximum, first quartile, third quartile, and median, as given in the Explore output (under Descriptives and Percentiles), are reflected on the boxplot.
- 7) The boxplot shows two additional facts about the Measured Weight data that are not given by the Explore output. Describe these facts.