Classwork 3

*October 8th 2018*

**Graphical Representations of Data Using the TI-83/84 series**

Instructions: Enter the following sets of data into the L1 list If you forget or need a refresher on how to enter Lists, open the previous classwork on D2L.

*L1 = Actress Age = { 44, 41, 62, 52, 41, 34, 34, 52, 41, 37, 38, 34, 32, 40, 43, 56, 41, 39, 49, 57, 41 }*

This is a sample of data that represents the age of actresses who have won the Oscar for Best Actress in a Film.

**Part 1 : Histograms**

Tutorial #1:

Let's create a histogram for this dataset.. Recall a histogram divides the sample into different classes and then counts the frequency of each class. The resulting graph gives an indication of the shape of the distribution. We need to tell our TI calculator to plot the list containing the dataset as a histogram and then we define the class limits.

First, turn on STAT PLOT

*2ND > STAT PLOT > 1 : Plot1 > ENTER > ENTER*

Notice this brings up a submenu for the display options for *Plot2*. There are several different types of graphs. We will cover most of these in class at some point. The bar chart in the upper right is a histogram; that's the one we are interested in right now. Select that option!

Change the *Xlist*: to L2 by placing your cursor over the box and then

*2ND > LIST > 1: L1*

The TI is almost ready to make a histogram! We just need to set the class limits. Tap *2ND > QUIT* to exit out of the STAT PLOT menu. Then navigate to the WINDOW menu. Type in the following for each parameter

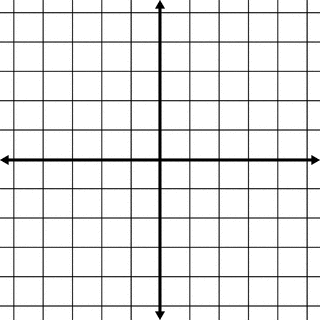
***Xmin =*** *2ND > LIST > Math > min > 2ND > L1*

***Xmax =*** *2ND > LIST > Math > max > 2ND > L1*

***Xscl =*** *5*

***Ymin =*** *0*

***Ymax =*** *2ND > LIST > Ops > dim > 2ND > L1*



The *Xmi*n and *Xma*x define the lower class limit and upper class limit for the first and last class respectively. *Xscl* defines the class width. *Ymin* and *Ymax* define the scale for the frequency. Simply tap GRAPH and your histogram should appear on screen!

**Problem**

1. Sketch the histogram outputted on your TI on the provided graph:

Use the TRACE function to accurately label the class

widths and frequencies!

**Part 2 : Box Plots**

Another way of visualizing a single variable dataset is with a Box Plot. Recall a box plot displays the five-number summary (Minimum, 25th Percentile, Median, 75th Percentile and Maximum), which gives us an idea of the spread of a distribution. If the box of the Box plot is tightly clustered the median, then most of the data is centered in that location with outlying observation, indicating the distribution has fat tails. However, a wide box in the Box Plot, with tails packed closely to the end of the box, indicates the distribution is randomly spread out over the values of the distribution.

Return to the STAT Plot Menu and select the Plot1 submenu

*2ND > STAT PLOT > 1 : Plot1 > ENTER*

In the *Type:* argument, select the Box Plot from the middle of the bottom row. This will convert the graph to a box plot. Now we just need to adjust the scale of the graph. Some of what we entered in the first part should carry over, but I'm going to write down what you would type in you had a blank screen,

***Xmin =*** *2ND > LIST > Math > min > 2ND > L1*

***Xmax =*** *2ND > LIST > Math > max > 2ND > L1*

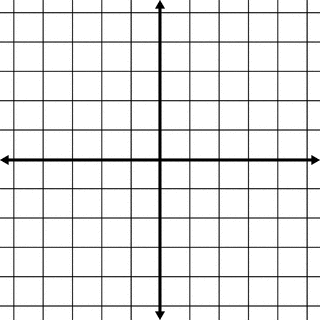
***Xscl =*** *1*

***Ymin =*** *0*

***Ymax =*** *1*

If you select GRAPH, you should see the box plot.

**Problem**



2. Sketch the Box Plot outputted on your TI on the provided graph:

Use the TRACE function to accurately label each quartile in the Box Plot.

**Par t 3 : Scatter Plots**

Instructions: Enter the following sets of data into the L2 and L3 lists.

*L2 = Average Monthly Temperature* = {*32, 45, 28, 57, 30, 68, 83, 52, 63, 30, 41, 84, 93, 23, 28, 39, 35*}

*In Degrees Fahrenheit*

*L3 = Monthly Heating Bill* = {*220, 110, 275, 83, 260, 33, 11, 88, 75, 245, 190, 10, 5, 283, 265, 216, 227}*

*In Dollars*

This is a *bivariate* dataset of paired observation (*x, y*), where x is the independent variable, Average Monthly Temperature, and y is the dependent variable, the Monthly Heating Bill. A scatter plot is a way of visualizing a two variable dataset by plotting each paired observation in the Cartesian plane.

First, enter these datasets in their respective lists, *L2* and *L3*. To create a scatter plot on TI, go back to the STAT PLOT menu

*2ND > STAT PLOT > 1 : Plot1*

In the *Type:* argument, select the first box in the upper left corner. You will notice a new argument, *Ylist:,* appears below *Xlist:.* Input L2 into the *Xlist:* and input L3 into the *Ylist:.* Then, as in the previous examples, before we plot, we need to adjust the window. Go the WINDOW menu and changing the viewing window as follows,

***Xmin =*** *2ND > LIST > Math > min > 2ND > L2*

***Xmax =*** *2ND > LIST > Math > max > 2ND > L2*

***Xscl =*** *1*

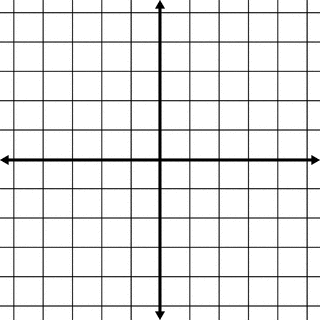
***Ymin =****2ND > LIST > Math > min > 2ND > L3*

***Ymax =*** *2ND > LIST > Math > max > 2ND > L3*

***Yscl*** *= 1*

Then you simply need to tap the GRAPH window and your scatter plot should appear.

**Problem**

1. Sketch the Scatter Plot outputted on your TI on the provided graph: