Classwork 1

*October 1st 2018*

**Introduction to the Statistical Features of the TI-83/84 series**

Introduction: All TI commands are written in sequential order using the '>' sign. For example, if I were provided the instructions for converting the number *3.5* to a mixed number, the instructions would read,

*3.5 > MATH > 1 : Frac > ENTER > ENTER*

Where this sequence indicates you type 3.5, then the the MATH button, then type either 1 or select *Frac* from the list of mathematical functions, and finally tap ENTER twice.

Note: If you happen to delete a list in your calculator, go to

*STAT > 5 : SetUpEditor > ENTER > ENTER*

and the lists columns will restore to their defaults.

Instructions: For the following set of problems, refer to the following dataset **S**

**S**= {*11, 11, 12, 13, 14, 14, 14, 15, 16, 17, 19, 20, 20* }

**Part 1 : Lists**

Tutorial #1:

*A. Entering Lists*

TI calculators store datasets as lists. The members of a list are called *elements.* Lists are contained in the L1, L2, … , L6 variables in a TI-83/84. You can edit the contents of a list with

*STAT > 1 : Edit > ENTER*

which brings up a table containing all of the lists. You can scroll through the table with the arrow keys. To edit an element, hover over it with the cursor, tap ENTER, type in the value of the element and tap ENTER again.

B. *List Operations*

1. **dim:** *calculates size of a List*

You can calculate the size of a list (i.e., the number of the elements in a list) with

*2ND > LIST > Right Arrow > 3 : dim > 2ND > LIST > 2: L2*

Alternatively, the lists can be referenced directly on the TI keyboard,

*2ND > LIST > Right Arrow > 3 : dim > 2ND > L2*

2. **sortA/sortD:** *sorts a List in either Ascending or Descending order.*

*2ND > LIST > Right Arrow > 1 : sortA > 2ND > LIST > 2 : L2*

3. **clrList:** *clears the contents of a list*

*STAT > 4 : ClrList > 2ND > LIST*

C. *List Functions*

Various functions can be accessed and applied to a dataset through the *Math* submenu in the *List* directory. To access the mathematical functions available to lists

*2ND > LIST > Right Arrow Twice*

Select the function with the arrow keys or numberpad and tap ENTER. The function will appear on screen. Next, select the list you wish to operate on by navigating to the *List* directory

*2ND > LIST*

Or by typing the List variable on the number pad,

*2ND > L1 – L6*

**Problems**

1. Populate the *L2* list with the dataset **S** by manually typing in each data point.

2. Calculate the number of observations in the dataset. Write your answer below**:**

**\_\_\_\_\_\_\_\_**

3. Sort the dataset in ascending order.

4. Using the appropriate function in the *Math* submenu, calculate the maximum value of the dataset. Write your answer below:

\_\_\_\_\_\_\_\_\_

5. Using the appropriate function in the *Math* submenu, calculate the minimum value of the dataset.

Write your answer below:

\_\_\_\_\_\_\_\_\_

6. Using the appropriate function in the *Math* submenu, calculate the mean of the dataset.

Write your answer below:

\_\_\_\_\_\_\_\_\_

7. Using the appropriate function in the *Math* submenu, calculate the median of the dataset.

Write your answer below:

\_\_\_\_\_\_\_\_\_

**Part 2: Sequences**

Tutorial #2:

**Formulaic Sequences**

1. **seq:** *generates user defined sequences of numbers*

Sometimes we need to generated sequential data, such as,

{*1, 2, 3, 4, 5* }

Rather than type this in by hand, we can use the **seq** function to auto-fill a given list according to a formula. First, go to the EDIT menu

*STAT > 1 : Edit*

and then place your cursor over the *name of the column itself* at the top very top and then

*2ND > LIST > Right Arrow > 5 : seq*

which should bring up a program menu for the **seq** function

*Expr:* \_\_\_\_\_\_

*Variable:* \_\_\_\_\_

*start*: \_\_\_\_\_\_

*end:* \_\_\_\_\_\_

*step:* \_\_\_\_\_\_

In the first box, use the Variable button and the *+-/x* operations to type in an expression. In the second box, identify the variable used in the first box. In the third box, enter the value you would like the variable to start at. In the fourth box, the value you want the variable to end at. In the fifth box, type in the how much you want the variable to increase by after each step.

For example, if I want to generated { 1, 2, 3… 10 }, I would type

*Expr:* X

*Variable:* X

*start*: 1

*end:* 10

*step:* 1

Then select the PASTE option and type ENTER twice. The sequence will auto-fill in the list column you pasted it into!

**Random Sequences**

2. **rand:** *generates a random number between 0 and 1*

Sometimes we need to generate random data. TI-83s and TI-84s have a random number generator, **rand**, that produces a random number between 0 and 1. It can be accessed through the *MATH Probability submenu*

*MATH > Right Arrow Three Times > 1 : rand*

We can use this function in conjunction with the **seq** to generate a random sequence of data. If we go through the steps in the previous part, but into the *Expr* box we type

*Expr:* rand

*Variable:* X

*start*: 1

*end:* 10

*step:* 1

We will end up with 10 random numbers between 0 and 1 in the L1 list.

3. **RandInt(** a, b ): *generates a random number between* a *and* b

We can also generate random numbers between any two endpoints that we desire with the **RandInt** function, also accessed through the *MATH Probability submenu*

*MATH > Right Arrow Three Times > 5 : RandInt*

The RandInt function requires two arguments, the lower and upper boundary of the random number you want to generated. For instance,

*RandInt(-2,20)*

will generate a random number between -2 and 20.

**Problems**

1. Create a sequence of numbers in L1 that starts at 1 and ends at the length of L2.

Hint: For the end option, instead of manually typing in the length of L2, type

*2ND > LIST > Right Arrow > 3 : dim > 2ND > L2*

which will automatically calculated the length of L2 for you.

2. a. Create a sequence in L3 that contains 25 elements that are random numbers between 0 and 1.

I. Verify that the maximum and minimum of L3 do not go above 1 or go below 0 by using the appropriate *List* functions.

b. Create a sequence of 30 elements that random numbers between 50 and 95 in L4.

3. Clear L1, L3 & L4 using the appropriate *L*ist command.

4. Experiment with the functions we have discussed so far and see if you can figure out how to paste L2 into L1.