Chapter 1
Introduction to the TI-83/84 Plus

Basics of the TI-83/84 Plus

The TI-83/84 Plus is turned on by pressing the ON key located in the bottom left hand corner. It is turned off by pressing 2nd OFF. Note that the TI-83/84 Plus has labeled keys and above the keys are symbols and commands printed in yellow and green on the TI-83 Plus and in blue and green on the TI-84 Plus. On the TI-83 Plus, the symbols and commands above the keys in yellow are accessed by pressing the yellow 2nd key followed by the desired key. On the TI-84 Plus, the symbols and commands above the keys in blue are accessed by pressing the blue 2nd key followed by the desired key. On both the TI-83 Plus and the TI-84 Plus, the green letters are accessed by pressing the green ALPHA key followed by the desired key.

The screen of the TI-83/84 Plus will lighten as the batteries are used. To darken the screen, press 2nd then press and hold ▲ until the screen is the desired darkness. Press 2nd, then press and hold ▼ to lighten the screen.

When the TI-83/84 Plus has low batteries, a message will appear on the home screen. The TI-83/84 Plus has two different types of batteries. You will probably only need to change the AAA batteries. The backup battery is a lithium battery designed to last years. When changing the batteries, programs and lists stored in memory may be lost. NEVER remove both the lithium battery and the AAA batteries at the same time. When changing AAA batteries, do not remove all four at the same time, but remove and replace each battery individually until all four have been changed. This will minimize the chance of losing stored programs and lists. When possible, it is best to backup programs and lists using a computer or another calculator before changing batteries.

The TI-83/84 Plus also has a catalog menu. This menu lists all the built-in functions and commands on the calculator and allows you to use them. However, it does not tell you where to locate the function or command. If you cannot remember where a certain function or command is located, press 2nd followed by 0 to access the catalog. You may arrow through the list using the arrow keys or jump to a section of the list by pressing the key associated with the letter at the beginning of the command you want.

Using the TI-83/84 Plus

Storing Data
Roughly speaking, data are the information collected in a statistical study and a data set consists of a particular collection of data. Each data set is stored in a list. There are several ways to enter data into the TI-83/84 Plus. They are entering the data directly, transferring the data from one

calculator to another, and transferring the data from a disk to the calculator via a computer and the TI-graph link. The method you choose will depend on what is available for your use.

Typing in a List

There are two ways a list can be entered and given a name. One is to enter the data into a generic list. The other is to enter the data into a named list. We will demonstrate both beginning with the generic list.

Typing Data into a Generic List

The TI-83/84 Plus has 6 lists numbered 1 through 6 built into it. Other lists may be stored and named (using names up to 5 characters long) as long as there is memory available.

1. From the home screen, press $\boxed{\text{STAT}}$. Your screen should appear as in Figure 1.1. You have now entered the statistics editor menu.

2. Press $\boxed{1}$ or press $\boxed{\text{ENTER}}$ to enter the stat editor. A screen similar to Figure 1.2 will appear.
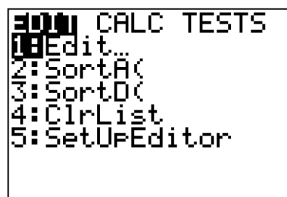
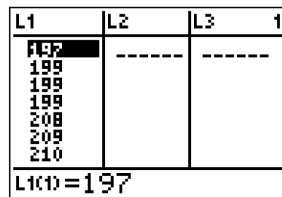Figure 1.1   Figure 1.2

If there is data listed under List 1, follow steps 3 and 4, otherwise skip to step 5.

3. To remove old data, before entering new data, arrow up until the name of the list is highlighted. See Figure 1.3.

4. Press $\boxed{\text{CLEAR}}$ and then arrow back down. Note: The list will not clear until the down arrow key is pressed. List 1 should now be clear as in Figure 1.4

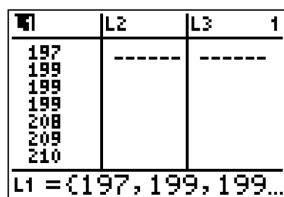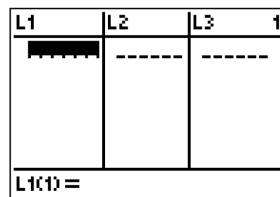Figure 1.3   Figure 1.4

5. Begin to enter your data by entering the number followed by pressing the down arrow key or $\boxed{\text{ENTER}}$ after each entry. Note: The TI-83/84 Plus distinguishes between negative signs and subtraction. For negative signs be sure to use the gray $\boxed{(\text{-})}$ key located next to the $\boxed{\text{ENTER}}$ key.

6. Be sure to check your entries to make sure all the numbers are correct. If an entry is wrong, use the arrow keys to highlight the entry and then type in the correct number pressing ENTER when you are done.

We have stored the data in List 1 which is noted as L1. The data will remain in the calculator even after the calculator has been turned off unless we clear the list or reset the calculator memory.

Typing in a Named List

1. Follow steps 1-2 above.

2. Arrow up until the cursor highlights one of the lists, (here we will use List 1) then arrow over until you have passed the last named list. A blank list with no name will appear. See Figure 1.5.

3. Name the list using the letters printed in green above the keys. Here we will use the name NAME. Spell out NAME by pressing the keys with the appropriate green letter above them.   (Note the calculator automatically enters Alpha mode.) *The list name cannot be more than 5 letters/numbers long and must start with a letter*. See Figure 1.6.

4. Begin to enter your data by entering the number followed by pressing the down arrow key or ENTER after each entry. Note: The TI-83/84 Plus distinguishes between negative signs and subtraction. For negative signs be sure to use the gray (-) key located next to the ENTER key.

5. Be sure to check your entries to make sure all the numbers are correct. If an entry is wrong, use the arrow keys to highlight the entry and then type in the correct number pressing ENTER when you are done.
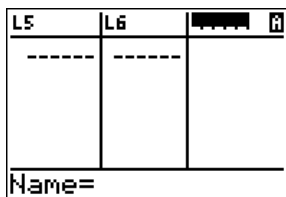
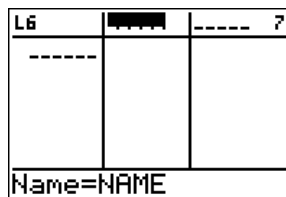6. Exit the stat list editor by pressing 2nd QUIT.
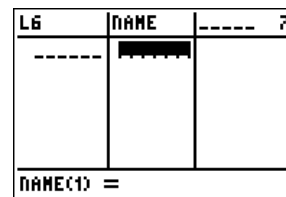
| Figure 1.5 | Figure 1.6 | Figure 1.7 |

Accessing a Named List

To access a named list on the home screen or in another menu press 2nd LIST and then select the list name by pressing its number or by arrowing down to the list and pressing ENTER.

Removing a List from the Stat Editor

To remove a list from the stat editor, arrow up to the name of the list and press DEL.

To return the stat editor to its factory setting of Lists 1-6 use the following steps.

1. Press STAT followed by 5 or arrow down to **5:SetUpEditor** and press ENTER. SetUp Editor will appear on your home screen.

2. Press ENTER and the calculator will respond with Done. If you reenter the stat editor, the lists 1 through 6 will be restored in order.

Sorting Data in a List

Once your data is stored in a list, there are several ways you can manipulate the data. This includes sorting the data in ascending or descending order, and doing arithmetic on entire lists. The following examples illustrate sorting lists.

1. We assume the data is contained in List 1. From the home screen, press STAT. Your screen will appear as in Figure 1.8.

2. Press 2 or arrow down to **2:SortA(** and press ENTER. **SortA(** will appear on your home screen.

3. Enter the name of the list you wish to sort, here List 1, by pressing 2nd L1 ENTER. The calculator will respond with Done as in Figure 1.9.

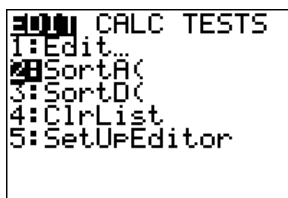4. Reenter the Stat Editor by pressing 2nd ENTER. Your data will be sorted and appear as in Figure 1.10.
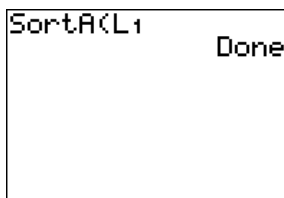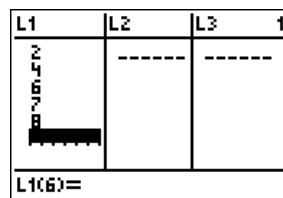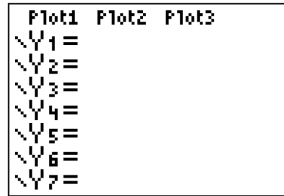

| Figure 1.8 | Figure 1.9 | Figure 1.10 |

The TI-83/84 Plus will sort in descending order if you use **3:SortD(** in place of **2:SortA(** in the above instructions.

Graph Windows

The TI-83/84 Plus is capable of doing several types of statistical graphs. Before attempting to graph any statistical plot, you must be sure that the function plot screen is cleared or that all function plots are turned off.
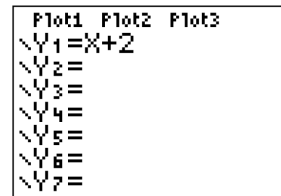
1. Press [Y=] to view the function plot screen. If the screen appears as in Figure 1.11, then you are ready to plot your statistical graph, so proceed to step 5.

```
Plot1 Plot2 Plot3          Plot1 Plot2 Plot3
\Y1=                       \Y1=X+2
\Y2=                       \Y2=
\Y3=                       \Y3=
\Y4=                       \Y4=
\Y5=                       \Y5=
\Y6=                       \Y6=
\Y7=                       \Y7=
```
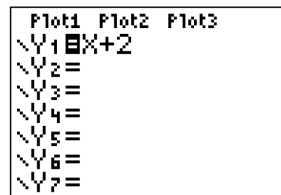   Figure 1.11   Figure 1.12

If you have a function in this window, such as in Figure 1.12, then you may either clear the function or turn that function off.

2. To clear a function, arrow to the line where the function appears and press [CLEAR]. Repeat this for all functions you wish to clear. If you clear all functions, your screen will appear as in Figure 1.11 above.

3. To turn off a function so that it does not graph, arrow to the line where the function appears and highlight the = of the function. Press [ENTER]. Arrow off the equal sign, and it will no longer be highlighted. See Figure 1.13. This means the function is turned off. (Should you wish to turn it back on again, arrow to the = sign and press [ENTER].   The equal sign will once again be highlighted.)

```
Plot1 Plot2 Plot3
\Y1▉X+2
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```
              Figure 1.13

4. Quit the function plot screen by pressing [2nd] QUIT.

5. Enter the stat plot screen by pressing [2nd] STAT PLOT. Your screen will appear similar to Figure 1.14.
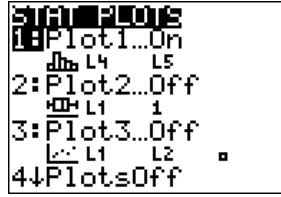
Figure 1.14

The TI-83/84 Plus allows for up to 3 statistical plots to be graphed at one time. For this example we will use plot 1.

6. Enter the set-up screen for plot 1 by pressing ENTER. Your screen should appear similar to Figure 1.15.
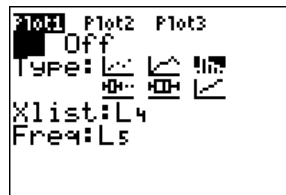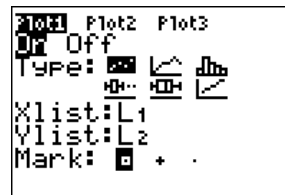

Figure 1.15   Figure 1.16

7. Turn Plot 1 on by highlighting On and pressing ENTER. See Figure 1.16.

8. Select the statistical plot you want to create by highlighting the appropriate icon in the Type list.

To create a scatterplot, select the scatterplot icon: ⌐⋯. This is the first icon in the top row of the Type list.

To create a line graph, select the line graph icon: ⌐⌃. This is the second icon in the top row of the Type list.

To create a histogram, select the histogram icon: ⊞ₙ. This is the third icon in the top row of the Type list.

To create a (modified) boxplot which shows outliers, select the boxplot icon: ⊡⋯. This is the first one in the bottom row of the Type list.
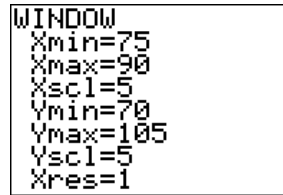
To create a boxplot which does not show outliers, select the boxplot icon: ⊞⊢. This is the second icon in the bottom row of the Type list.

To create a normal probability plot, select the normal probability plot icon: ⌐. This is the third icon in the bottom row of the Type list.

After selecting the appropriate icon, press ENTER.

Now we must select the section of the graph that the TI-83/84 Plus will show you. Do this by entering the window screen. It is important to remember to adjust the window you are using each time you plot a new graph.

11. Press WINDOW to enter the window screen. Your screen should appear similar to Figure 1.17.

```
WINDOW
 Xmin=75
 Xmax=90
 Xscl=5
 Ymin=70
 Ymax=105
 Yscl=5
 Xres=1
```
Figure 1.17

12. Enter a Xmin value that is slightly lower than your lowest x-value. Arrow down and enter a Xmax that is slightly above the highest x-value. Xscl sets how far apart your marks are on the x-axis, so pick a value based on your Xmin and Xmax.

13. Enter a Ymin value that is slightly lower than your lowest y-value. Arrow down and enter a Ymax that is slightly above the highest y-value. Yscl sets how far apart your marks are on the y-axis, so pick a value based on your Ymin and Ymax.
Note Xres is a setting for function graphing and we do not need to worry about it for statistical plots. Therefore, we will always leave it set at 1.

14. Press GRAPH to display the graph.

15. Because the TI-83/84 Plus does not display the values along the x and y-axes, the easiest way to identify a point is to use the Trace feature. Press TRACE. By using the left and right arrow keys, you can move the cursor from point to point and read off the values at the bottom of the screen. The up and down arrow keys allow you to switch between plots when plotting more than one graph on the screen at one time.

16. To clear the Trace data from the screen, press CLEAR. Press CLEAR again and the graph will clear and you will return to the home screen.