

TI-83 & TI-84: Five-Number Summary Statistics and Box-and-Whisker Plots

The following pages contain some instructions on the usage of the TI-83/84 graphing calculators.

The example used below is taken out of David Moore's text titled "The Basic Practice of Statistics, 2nd Edition".

Example#1.9 p. 34: Mark McGwire's home run counts (arranged in increasing order) are given below.

9 9 22 32 33 39 39 42 49 52 58 70

Babe Ruth's home run counts (arranged in increasing order) are given below.

22 25 34 35 41 41 46 46 46 47 49 54 54 59 60

The data sets are entered into the TI-83 or 83 Plus by using the STAT menu, which is accessed by pressing **STAT**. Press **ENTER** to select **1:Edit** from the STAT EDIT menu. At this point, your screen will display all the list names and their contents stored in memory. Press **↑** to move the cursor to the top line where the list names are located and then press **→** until you reach the unnamed column. The cursor is in alpha mode as it is indicated by the highlighted capital A in the upper right hand corner of your display. Type in the name MM for McGwire's data set. Press **ENTER** to store the list name. Press **↓** to begin entering the data set. Start typing in the home run counts from McGwire's data set, pressing **ENTER** after each data point. When you have finished entering the last home run count, your screen should look like the screen on the left below.

| LG | PERP | MM | A |
|----------|------|----|---|
| | 14.3 | 39 | |
| | 12.8 | 42 | |
| | 18.5 | 49 | |
| | 9.9 | 52 | |
| | 12.9 | 58 | |
| | 11.4 | 70 | |
| | 12.5 | | |
| MM(13) = | | | |

| PERP | MM | BR | A |
|----------|----|----|---|
| 9.9 | 52 | 47 | |
| 12.9 | 58 | 49 | |
| 11.4 | 70 | 54 | |
| 12.5 | | 54 | |
| 12.6 | | 59 | |
| 15.2 | | 60 | |
| 13.7 | | | |
| BR(16) = | | | |

To enter Ruth's data set press **STAT**. Press **ENTER** to select **1:Edit** from the STAT EDIT menu. Press **↑** to move the cursor to the top line where the list names are located and then press **→** until you reach the unnamed column. The cursor is in alpha mode as it is indicated by the highlighted capital A in the upper right hand corner of your display. Type in the name BR for Ruth's data set. Press **ENTER** to store the list name. Press **↓** to begin entering the data set. Start typing in the home run counts from the Ruth's data set, pressing **ENTER** after each data point. When you have finished entering the last home run count, your screen should look like the screen on the right given above.

Press **STAT** and press **→** to display the choices for the STAT CALC menu. At this point, your screen should look like the screen on the left below. Press **ENTER** to select and

paste **1:1-Var Stats** (one variable statistics) command onto the Home screen. At this point, your screen should look like the screen on the right below.

```

EDIT  TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7:QuartReg
    
```

```

1-Var Stats
    
```

Now the list name MM needs to be pasted where the blinking cursor is on the Home screen. To accomplish this the LIST menu is accessed by pressing **2nd** and **STAT**. Press **↓** till you move the cursor by the name MM and press **ENTER** to paste the list name MM by the **1-Var Stats** command on the Home screen. Your screen should look like the screen on the left below.

```

1-Var Stats LMM
    
```

```

1-Var Stats
x=37.83333333
Σx=454
Σx²=20934
Sx=18.48258804
σx=17.69573081
↓n=12
    
```

Press **ENTER**. Your screen should look like the screen on the right above. Press **↓** to see the rest of the items in the one-variable statistics display. Pressing **↓** five times will take you all the way to the end of the one-variable statistics display. Your screen should look like the screen on the left below.

```

1-Var Stats
↑n=12
minX=9
Q1=27
Med=39
Q3=50.5
maxX=70
    
```

```

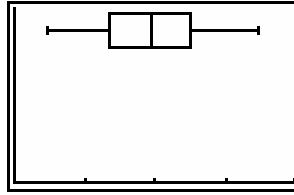
Plot1 Plot2 Plot3
On Off
Type: [ ] [ ] [ ]
Xlist:MM
Freq:1
    
```

The items consisting of minX, Q₁, Med, Q₃, and maxX in the display on the left are known as the five-number summary statistics. The five-number summary leads us to a graph called the box-and-whisker plot. Press **2nd** and **Y=** to go into the STAT PLOTS menu. Press **ENTER** to get to the settings screen for **Plot1**. While the cursor blinking over the **On** option press **ENTER** to turn on **Plot1**. Press **↓** to scroll down to **Type:**, then press **→** four times to move the blinking cursor over the fifth type (boxplot), and press **ENTER** to make the selection. Press **↓** to scroll down to **Xlist:** The list name MM, which had been already stored, must be assigned to **Xlist:** Press **2nd** and **STAT** to access the LIST menu. Press **↓** till you move the cursor by the name MM and press **ENTER** to paste the name by **Xlist:** Your screen should look like the screen on the right above. Now, the appropriate WINDOW settings for the box-and-whisker plot must be chosen. Press **WINDOW** to go into WINDOW menu. Use the following window settings displayed on the left below.

```

WINDOW
Xmin=0
Xmax=80
Xscl=20
Ymin=0
Ymax=5
Yscl=0
Xres=1

```



Press **GRAPH** to see the box-and-whisker plot displayed on the right above. Before graphing, be sure to turn off **Plot2** and **Plot3**. Also make sure that there are no functions in the function editor **Y=**.

Press **TRACE**. Press **)** or **(** to see the minimum, first quartile, median, third quartile, and maximum values displayed.

Now the same procedure can be repeated for Ruth's data set. Press **STAT** and press **)** to display the choices for the STAT CALC menu. Press **ENTER** to select and paste **1:1-Var Stats** (one variable statistics) command onto the Home screen. Press **2nd** and **STAT** to access the LIST menu. Press **↓** till you move the cursor by the name BR and press **ENTER** to paste the list name BR by the **1-Var Stats** command on the Home screen. Press **ENTER**. Your screen should look like the screen on the left below.

```

1-Var Stats
x̄=43.93333333
Σx=659
Σx²=30723
Sx=11.24701018
σx=10.86564412
↓n=15

```

```

1-Var Stats
n=15
minX=22
Q1=35
Med=46
Q3=54
maxX=60

```

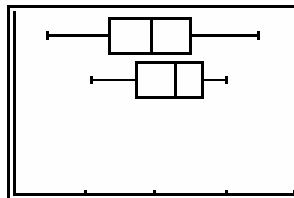
Press **↓** to see the rest of the items in the one-variable statistics display. Pressing **↓** five times will take you all the way to the end of the one-variable statistics display. Your screen should look like the screen on the right above.

Press **2nd** and **Y=** to go into the STAT PLOTS menu. Press **↓** to go to **Plot2**. Press **ENTER** to get to the settings screen for **Plot2**. While the cursor blinking over the **On** option press **ENTER** to turn on **Plot2**. Press **↓** to scroll down to **Type:**, then press **)** four times to move the blinking cursor over the fifth type (boxplot), and press **ENTER** to make the selection. Press **↓** to scroll down to **Xlist:** The list name BR, which had been already stored, must be assigned to **Xlist:** Press **2nd** and **STAT** to access the LIST menu. Press **↓** till you move the cursor by the name BR and press **ENTER** to paste the name by **Xlist:** Your screen should look like the screen on the left below.






```

Plot1: Off Plot3:
Type: [ ] [ ] [ ] [ ] [ ]
Xlist: BR
Freq: 1

```



Press **GRAPH** to see the side-by-side box-and-whisker plots comparing the number of home runs per year by Mark McGwire and Babe Ruth displayed on the right above. Before graphing, be sure to turn on **Plot1** and **Plot2**. Also make sure that there are no functions in the function editor **Y=**.

Press . Press  or  to see the minimum, first quartile, median, third quartile, and maximum values displayed. When tracing, press  and  to switch between **Plot1** and **Plot2**.