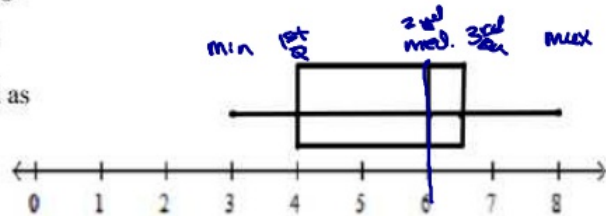


**Notes: T4-68 Box Plots, Med, IR**

**Box Plots, Range, Median, and Interquartile Range**

A **Box plot** is a graph the general spread of the data

The data set 3, 4, 4, 5, 6, 6, 6, 7, 8 would be graphed as



In order to make a box plot you need to find 5 descriptive numbers for the data set. They are:

Minimum (min): The lowest number in the data set.

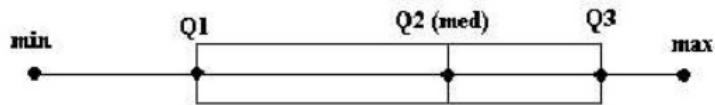
1<sup>st</sup> Quartile ( $Q_1$ ): The middle of the lower half of the data set.  $\frac{1}{4}$

Median (med): The middle value of the data set.  $\frac{1}{2}$

3<sup>rd</sup> Quartile ( $Q_3$ ): The middle of the upper half of the data set.  $\frac{3}{4}$

Maximum (max): The largest number in the data set.

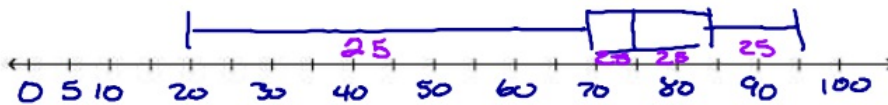
Then they are graphed as shown at right.



By hand find the five values listed above for the data set representing test scores for one math class. Then make a box plot of the data. Be sure to put the data in order first.

70, 70, 75, 75, 90, 70, 80, 85, 65, 95, 70, 85, 90, 70, 20  
20, 65, 70, 70, 70, 70, 70, 75, 75, 80, 85, 85, 90, 90, 95

Min: 20       $Q_1$ : 70      Med: 75       $Q_3$ : 85      Max: 95



2. Does the data set have any outliers? How does this point affect the box plot?

20      Stretches.

3. What effect, if any, does the outlier have on the median?

none

4. Range is found by subtracting max. – min. What is the range? What effect does the outlier have on range?

$95 - 20 = 75$

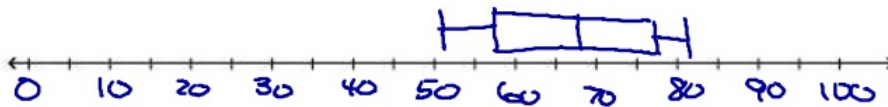
5. Interquartile Range (IQR) is found by subtracting  $Q_3 - Q_1$ . What is the IQR? What effect does the outlier have on the IQR?

$85 - 70 = 15$

What if you had a data set with a lot of points? It would take a long time to put them in order and find the median and the quartiles. Luckily, your calculator can find the 5 descriptive points for you.

6. Find the 5 descriptive points for the data set and make a box plot.  $\frac{67.0 + 69.8}{2} = 68.4$  med  
 The average monthly temperatures in Jacksonville, FL.

52.4, 55.2, 61.1, 67.0, 73.4, 79.1, 81.6, 81.2, 78.1, 69.8, 61.9, 55.1  
 Min: 52.4,  $Q_1$ : 58.15, Med: 68.4,  $Q_3$ : 78.6, Max: 81.6



7. Find the range. Is the range greatly affected by any one particular point?
8. Find the IQR. Is the IQR greatly affected by any one particular point?