

# Statistics: Data Exploration

key

1. List the minimum, Q1, median, Q3, and the maximum?

Min = 42, Q1 = 50.75, Median = 54.5, Q3 = 57.25, and Max = 69

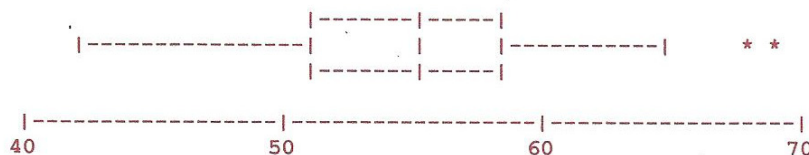
2. Are there any outliers? Show all your work. List any low or high outliers. If there are none, just write, "No outliers."

There is one outlier, a high outlier. The IQR is  $57.25 - 50.75 = 6.5$ , and thus,  $1.5(6.5) = 9.75$ .

Thus, anything below  $50.75 - 9.75 = 41$  is a low outlier. The lowest observation is 42.

Anything above  $57.25 + 9.75 = 67$  is a high outlier. Thus, there are two high outliers: 68 and 69, representing William Henry Harrison and Ronald W. Reagan respectively.

3. Based on the information gathered in questions 1 and 2, construct a *modified* box-and-whiskers plot.



4. What is the mean and standard deviation of this data?

$\bar{x} = 54.6363636364$  and  $s = 6.2732021759$

5. For this, we round the values to  $\bar{x} = 54.6$  and  $s = 6.3$ ... the top row represents "counts," the percentages are found by dividing each count by 44 (the number of presidents).

0	7	15	13	7	2
0%	16%	34%	30%	16%	4.5%
35.7	42.0	48.3	54.6	60.9	67.2

The question is this: how close does this data adhere to the 68-95-99 Rule? According to our work, 64% of the presidents fall within one standard deviation of the mean; 96% of them fall within two standard deviations of the mean; and 100% of them fall within three standard deviations of the mean.

While no data is perfect, this data is relatively close, and therefore, can be called *normal*.

