

Section 17.2: Box and Whisker Plots

Essential Question: How do you create a box-and-whisker plot?

Example 1: Construct a box-and-whisker plot for the following data.

Ages of first 41 presidents at the time each took office

4	23
*	6 7 8 9 9
5	0 1 1 1 1 1 2 2 4 4 4 4
*	5 5 5 5 6 6 6 6 7 7 7 7 8
6	0 1 1 1 2 4 4
*	5 8 9

Key: $4 \div 2 = 42$ years old

smallest/lowest value
largest value

Find the lower and upper extreme values. Lower = 42 Upper = 69

Find the median. Median = 55 (middle #)

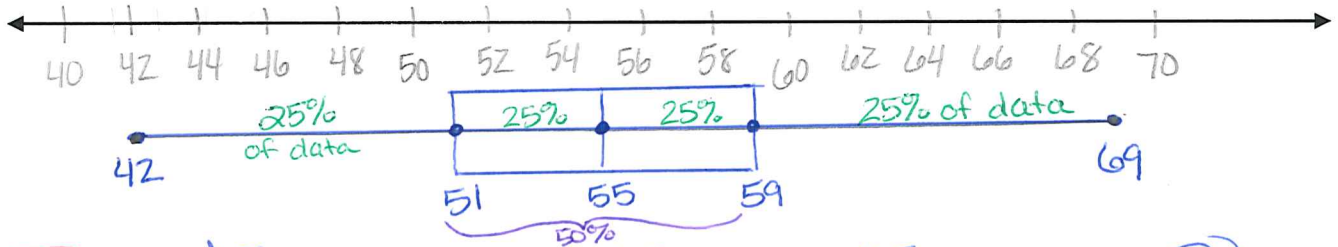
Find the lower quartile and upper quartile.

- Do NOT include the median
- Lower Quartile is the median of the lower half
- Upper Quartile is the median of the upper half

Lower quartile = 51

Upper quartile = 59

$\frac{58+60}{2} = 59$



Range: is the difference between the LE and the UE $69-42 = 27$

Interquartile range (IQR): is the difference between the UQ and the LQ $59-51 = 8$

Outliers: Any data whose distance is greater than $(1.5 \times \text{IQR})$ away from the UQ and less than $(1.5 \times \text{IQR})$ away from the LQ

$(1.5)(8) = 12$

$LQ - 12 = 51 - 12 = 39$

$UQ + 12 = 59 + 12 = 71$

any # out of this range is an outlier

*No outliers for this data set

Section 17.2 Summary:

- Find the 5# summary:
 - lower extreme (LE) = smallest value
 - upper extreme (UE) = largest value
 - median = middle # of ordered data
 - Lower Quartile (LQ) = median of lower 1/2
 - Upper Quartile (UQ) = median of upper 1/2
- Draw a # line to plot 5# summary
- Check for outliers

$(1.5)(\text{IQR}) = \#$

$LQ - \#$

$UQ + \#$

any data out of this range is an outlier

