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Section 2.4 PART V

Summarizing Data using Measures of Variability

Amounts of Juice in 8 bottles (marked 16oz).

Sorted $\{15.1, 15.2, 15.3, 15.5, 15.6, 15.7, 15.7, 15.8\}$ Sorted

(1, 2, 3, 4, 5, 6, 7, 8)

Median

$n = 8$, even, median positions: $\frac{n}{2}$ & $\frac{n}{2}+1$

$\downarrow$ 4 $\downarrow$ 5

Median $= \tilde{x} =$ avg. of values in these positions.

$$\tilde{x} = \frac{15.5 + 15.6}{2} = 15.55$$ ← A.K.A. the second quartile Q_2

The First Quartile (Q_1) = median of the lower ½ of the data set (exclude middle value if n is odd).

Juice bottles, "lower ½": 15.1, 15.2, 15.3, 15.5 (1, 2, 3, 4)

$$Q_1 = \frac{15.2 + 15.3}{2} = 15.25$$

The Third Quartile (Q_3) = median of the upper ½ of the data set (exclude middle value if n is odd).

Juice bottles, "upper ½": 15.6, 15.7, 15.7, 15.8 (1, 2, 3, 4)

$$Q_3 = \frac{15.7 + 15.7}{2} = 15.7$$

The Inter-quartile range (the length of the "middle 50"). ← IQR

$$IQR = Q_3 - Q_1 = 15.7 - 15.25 = 0.45$$ ←