

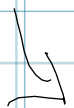
Section 2.3
 Part II

Summarizing Data Using Averages

Adult Female
 Heights (cm)

x	
148.0	1
152.2	2
152.7	3
155.1	4
155.2	5
155.5	6
156.2	7
156.8	8
156.9	9
157.9	10
158.0	11
158.3	12
158.4	13
158.6	14
159.8	15
159.8	16
159.9	
160.2	
160.9	
162.3	
162.4	
164.0	
164.2	
166.9	
167.2	
167.6	
170.4	
175.9	
176.4	
184.1	

SORTED



$n=30$

Median

Positions:

$$\frac{n}{2} = 15$$

$$\frac{n}{2} + 1 = 16$$

Values in

Positions

15 & 16 are

159.8 & 159.8

The median

is the mean

of these.

$$\tilde{x} = \frac{159.8 + 159.8}{2}$$

$$\tilde{x} = 159.8$$

Trimmed Mean: If a sample distribution is skewed, a trimmed mean can give a better estimate of the population mean. We remove a few of the smallest & largest (the same number of each) values.

If we remove the smallest & largest height the total is 4509.7, from 28 values.

$$\text{Trimmed mean} = \frac{4509.7}{28} \approx 161.06$$

Mode: most frequent value in the data set.

$$\text{mode} = 159.8 \text{ cm.}$$

$$\text{Midrange} = \frac{\min + \max}{2} = \frac{148.0 + 184.1}{2}$$

↑ easily influenced by outliers.

$$= 166.05 \text{ cm}$$

Median: A central value of a sorted list. Let $n = \text{sample size}$.

• If n is odd then the median is in position $\frac{n+1}{2}$.

Ex: $\{ \underset{1}{1.3}, \underset{2}{2.7}, \underset{3}{6.5}, \underset{4}{7.3}, \underset{5}{9.4}, \underset{6}{10.2}, \underset{7}{11.1} \}$

$$n=7 \Rightarrow \text{median position} = \frac{n+1}{2} = \frac{7+1}{2} = 4$$

$$\text{median} = \tilde{x} = 7.3$$

• If n is even, then the median is the mean of the values in positions $\frac{n}{2}$ & $\frac{n}{2} + 1$.

Ex: Women's heights. $\frac{n}{2} = 15$, $\frac{n}{2} + 1 = 16$.

$$\text{Values: } 159.8 \text{ \& } 159.8, \tilde{x} = \frac{159.8 + 159.8}{2}$$

$$\tilde{x} = 159.8$$