

Section 2.6

PART I

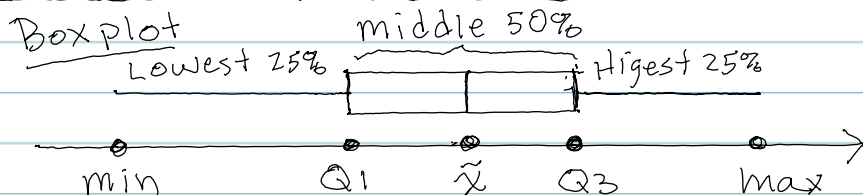
Data Exploration Boxplots & Outliers

Women's Heights (cm)

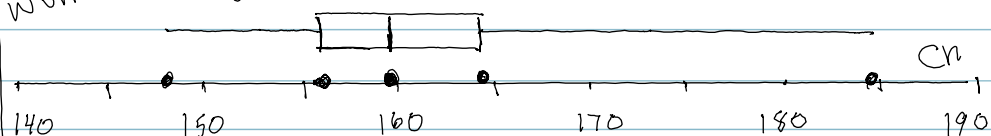
① → 148.0	159.8 ← ⑩
152.2	159.9
152.7	160.2
155.1	160.9
155.2	162.3
155.5	162.4
156.2	164.0
156.8	164.2 ← Q ₃
156.9	166.9
157.9	167.2
158.0	167.6
158.3	170.4
158.4	*175.9
158.6	*176.4
159.8	*184.1 ← ③

The 5-Point Summary: Min, Q₁, $\tilde{x}$, Q₃, max

For Women's Heights: $\hookrightarrow$ 5 pt summary
Min = 148.0, Q₁ = 156.8, $\tilde{x}$ = 159.8,
Q₃ = 162.4, Max = 184.1.



Boxplot of Women's Heights



Classifying Outliers:

Rule:

- $\rightarrow$ If $x > Q_3 + 1.5 \cdot IQR$ then x is a high outlier.
- $\rightarrow$ If $x < Q_1 - 1.5 \cdot IQR$ then x is a low outlier.

($IQR = \text{Inter-quartile Range} = \text{length of middle } 50\%$)
 $IQR = Q_3 - Q_1$

Women's heights: $IQR = Q_3 - Q_1 = 162.4 - 156.8 = 7.4 \text{ cm}$

Outlier upper limit: $Q_3 + 1.5 \cdot IQR$

$$= 162.4 + 1.5 \cdot 7.4 = 175.3 \text{ cm}$$

$\rightarrow$ 3 heights greater than this: 175.9, 176.4, 184.1
High outliers.

Outlier lower limit: $Q_1 - 1.5 \cdot IQR$

$$= 156.8 - 1.5 \cdot 7.4 = 145.7 \text{ cm}$$

$\rightarrow$ No heights lower than this: no low outliers.