Day	Minimum	Q1	Median	Q3	Maximum
	32	56	74.5	82.5	99
Night	25.5	78	81	89	98

Question:

a.) The Interquartile range. Compare the two interquartile ranges.

b) Any outliers in either set

Calculation

$IQR = Q3 - Q1$

Day $\Rightarrow$

$IQR = 82.5 - 56$
$= 26.5$

Night $\Rightarrow$ ~~89-78~~

$IQR = 89 - 78$
$= 11$

$(1.5)(IQR)$

Day $= 1.5 * 26.5$
$= 39.75$

Night $= 1.5 \times 11$
$= 16.5$

Lesser outliers $\Rightarrow$

outlier range $= Q_1 - 1.5 * IQR$

Day $\Rightarrow 56 - 1.5 * 26.5$
$= 56 - 39.75$
$= 16.25$

Night $= 78 - 1.5 * 11$
$= 78 - 16.5$
$= 61.5$

Greater outliers $\Rightarrow$
$= Q3 + 1.5 * IQR$

Day $\Rightarrow 82.5 + 1.5 * 26.5$
$= 82.5 + 39.75$
$= 122.25$

Night $\Rightarrow 89 + 1.5 * 11$
$= 89 + 16.5$
$= 105.5$

Detailed report for the Day and Night data

- Interquartile Range calculation $- IQR = Q_3 - Q_1$

  Day $= 26.5$
  Night $= 11$

- Comparison

  The Day data has a larger interquartile range of 26.5 than the Night of 11, indicating that the middle 50% of Day values are more spread out compared to Night.

- Outlier Detection using IQR

  Outliers are detected by computing Range (Fences)

  $$\left. \begin{array}{c} \text{Lower Range} \\ \text{or} \\ \text{Lower Fence} \end{array} \right\} \quad Q_1 - 1.5 \times IQR$$

  $$\left. \begin{array}{c} \text{Greater Range} \\ \text{or} \\ \text{Greater Fence} \end{array} \right\} = Q_3 + 1.5 \times IQR$$

  Day

  Lower Fence $= 16.25$
  Greater Fence $= 122.25$

  Day Minimum $= 32$, Maximum $= 99$
  All values fall within the fences, so there are no outliers in the Day dataset.

  Night

  Lower Fence $= 61.5$
  Greater Fence $= 105.5$

  Minimum $= 25.5$, Maximum $= 98$
  Night Minimum is below than lower Fence, so 25.5 is an outlier in the Night dat. All other values are within the range.