

Question 3

The following data represent measurements (in cm) of shell lengths collected from a deposit in Spain

1.

Let the number of sample be:

$$n = 33$$

Let the data in ascending order be:

$$x_1 = 1.23, \quad x_2 = 2.77, \quad \dots, \quad x_i, \quad \dots, \quad x_n = 8.86, \quad i \in \{1, 2, \dots, n\}$$

Then we have the mean:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{15\,984}{3\,300} \approx 4.844$$

Then we have the variance:

$$\sigma_x^2 = \frac{1}{n} \sum_{i=1}^n x_i^2 - \bar{x}^2 \approx 3.342$$

We have the index of the median:

$$i_m = \frac{n+1}{2} = 17$$

Then we have the median:

$$m = x_{i_m} = 4.4$$

Answer

- $\bar{x} = \frac{15\,984}{3\,300} \approx 4.844$

- $\sigma_x^2 \approx 3.342$
 - $m = 4.4$
-

2.

Let the second quartile be:

$$Q_2 = m = 4.4$$

As well as the index of the second quartile:

$$i_{Q_2} = i_m = 17$$

Then we have the index of the first quartile (Q_1) and the index of the third quartile (Q_3):

$$i_{Q_1} = \frac{i_m + 1}{2} = 9$$

$$i_{Q_3} = \frac{i_m + n}{2} = 25$$

Then we have the first quartile and the third quartile:

$$Q_1 = x_{i_{Q_1}} = 3.58$$

$$Q_3 = x_{i_{Q_3}} = 5.24$$

Then we have the IQR:

$$\text{IQR} = Q_3 - Q_1 = 1.66$$

Answer

- $\text{IQR} = 1.66$
-

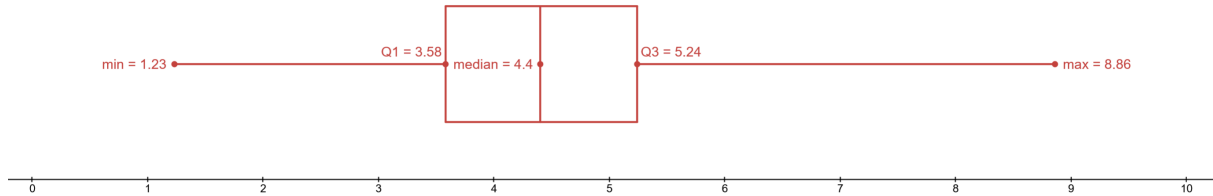
3.

Let the minimum (min) and the maximum (max) be:

$$\min = x_1 = 1.23$$

$$\max = x_n = 8.86$$

Then we have the boxplot:



Answer

