

1. Solution

The sample size, n , is 54. We determine the indices and values of Q1, Q2, and Q3.

| Quartile | Formula for i | i | x |
|----------|--------------------------------|-----|-------|
| Q1 | $\lceil 0.25 \times 54 \rceil$ | 14 | 54.41 |
| Q2 | $\lceil 0.5 \times 54 \rceil$ | 27 | 54.81 |
| Q3 | $\lceil 0.75 \times 54 \rceil$ | 41 | 55.28 |

We determine the IQR.

$$\begin{aligned} \text{IQR} &= Q3 - Q1 \\ &= 55.28 - 54.41 \\ &= 0.87 \end{aligned}$$

We determine the outlier boundaries.

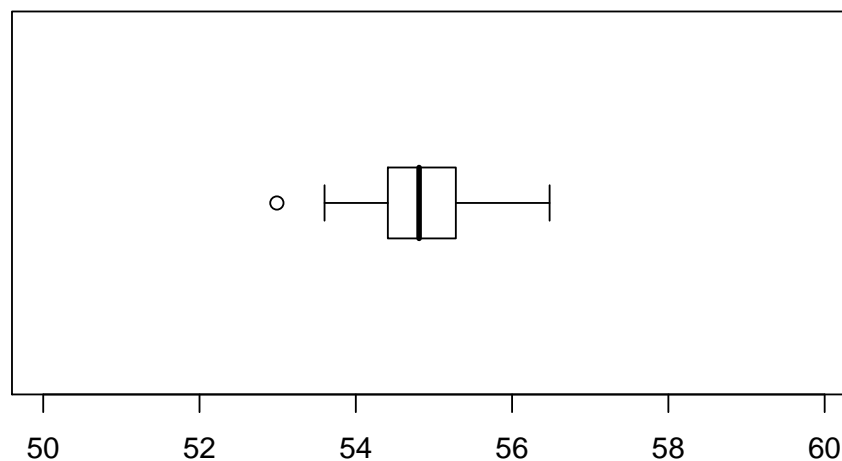
$$\begin{aligned} \text{lower boundary} &= Q1 - 1.5 \times \text{IQR} \\ &= 54.41 - 1.5 \times 0.87 \\ &= 53.105 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= Q3 + 1.5 \times \text{IQR} \\ &= 55.28 + 1.5 \times 0.87 \\ &= 56.585 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{52.99\}$$

We identify the ends of the whiskers: 53.6 and 56.48. We plot the boxplot.



2. Solution

The sample size, n , is 27. We determine the indices and values of Q1, Q2, and Q3.

| Quartile | Formula for i | i | x |
|----------|--------------------------------|-----|-------|
| Q1 | $\lceil 0.25 \times 27 \rceil$ | 7 | 51.36 |
| Q2 | $\lceil 0.5 \times 27 \rceil$ | 14 | 51.51 |
| Q3 | $\lceil 0.75 \times 27 \rceil$ | 21 | 51.64 |

We determine the IQR.

$$\begin{aligned} \text{IQR} &= Q3 - Q1 \\ &= 51.64 - 51.36 \\ &= 0.28 \end{aligned}$$

We determine the outlier boundaries.

$$\begin{aligned} \text{lower boundary} &= Q1 - 1.5 \times \text{IQR} \\ &= 51.36 - 1.5 \times 0.28 \\ &= 50.94 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= Q3 + 1.5 \times \text{IQR} \\ &= 51.64 + 1.5 \times 0.28 \\ &= 52.06 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{50.92\}$$

We identify the ends of the whiskers: 51.04 and 52.02. We plot the boxplot.

