1. **Solution**
The sample size, n, is 49. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 49 \rceil$	13	61.96
Q2	$\lceil 0.5 \times 49 \rceil$	25	62.48
Q3	$\lceil 0.75 \times 49 \rceil$	37	62.79

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 62.79 - 61.96 \\ &= 0.83 \end{aligned}$$

We determine the outlier boundaries.

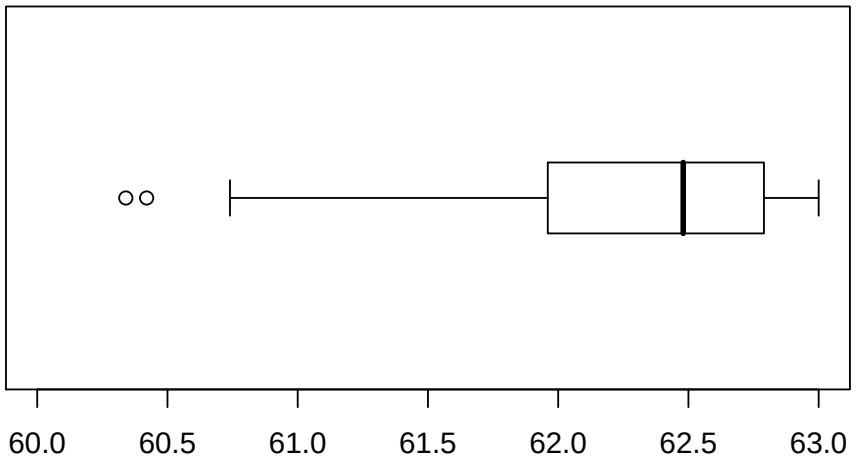
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 61.96 - 1.5 \times 0.83 \\ &= 60.715 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 62.79 + 1.5 \times 0.83 \\ &= 64.035 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{60.34, 60.42\}$$

We identify the ends of the whiskers: 60.74 and 63. We plot the boxplot.



2. **Solution**
The sample size, n, is 45. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 45 \rceil$	12	12.06
Q2	$\lceil 0.5 \times 45 \rceil$	23	13.91
Q3	$\lceil 0.75 \times 45 \rceil$	34	16.04

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 16.04 - 12.06 \\ &= 3.98 \end{aligned}$$

We determine the outlier boundaries.

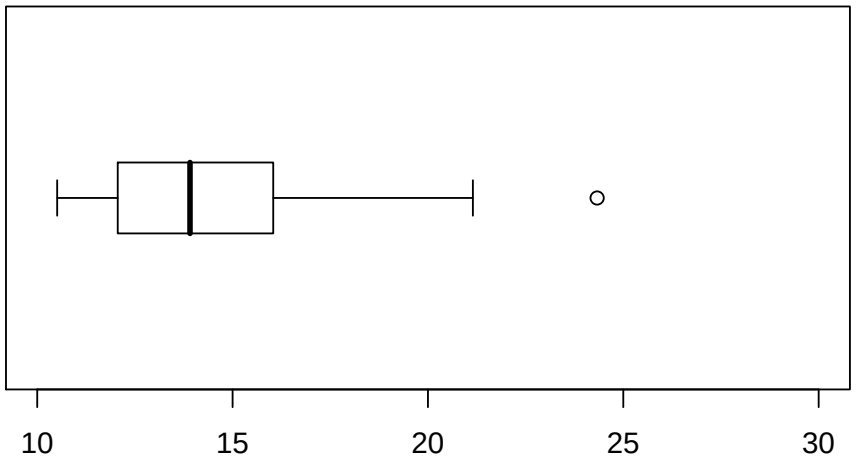
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 12.06 - 1.5 \times 3.98 \\ &= 6.09 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 16.04 + 1.5 \times 3.98 \\ &= 22.01 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{24.33\}$$

We identify the ends of the whiskers: 10.51 and 21.15. We plot the boxplot.



1. **Solution**
The sample size, n, is 28. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 28 \rceil$	7	60.7
Q2	$\lceil 0.5 \times 28 \rceil$	14	70.77
Q3	$\lceil 0.75 \times 28 \rceil$	21	75.01

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 75.01 - 60.7 \\ &= 14.31 \end{aligned}$$

We determine the outlier boundaries.

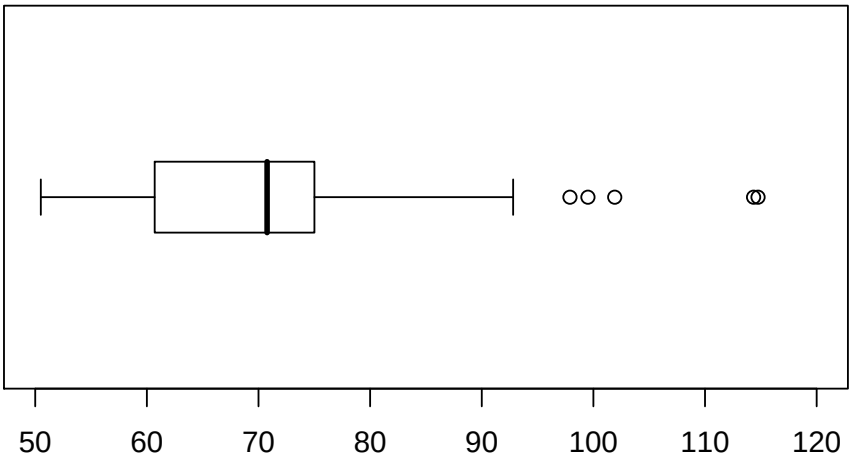
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 60.7 - 1.5 \times 14.31 \\ &= 39.235 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 75.01 + 1.5 \times 14.31 \\ &= 96.475 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{97.9, 99.51, 101.91, 114.35, 114.75\}$$

We identify the ends of the whiskers: 50.5 and 92.81. We plot the boxplot.



2. **Solution**
The sample size, n, is 42. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 42 \rceil$	11	76.78
Q2	$\lceil 0.5 \times 42 \rceil$	21	90.84
Q3	$\lceil 0.75 \times 42 \rceil$	32	99.06

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 99.06 - 76.78 \\ &= 22.28 \end{aligned}$$

We determine the outlier boundaries.

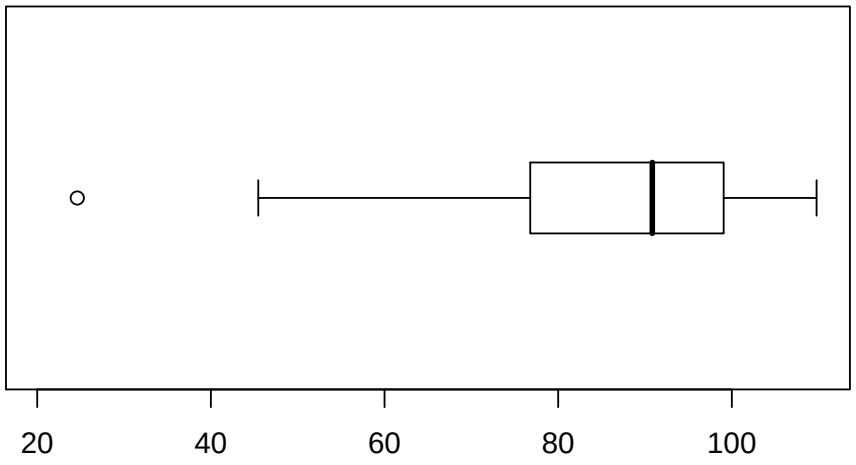
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 76.78 - 1.5 \times 22.28 \\ &= 43.36 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 99.06 + 1.5 \times 22.28 \\ &= 132.48 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{24.61\}$$

We identify the ends of the whiskers: 45.46 and 109.76. We plot the boxplot.



1. **Solution**
The sample size, n, is 24. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 24 \rceil$	6	39.43
Q2	$\lceil 0.5 \times 24 \rceil$	12	40.22
Q3	$\lceil 0.75 \times 24 \rceil$	18	40.87

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 40.87 - 39.43 \\ &= 1.44 \end{aligned}$$

We determine the outlier boundaries.

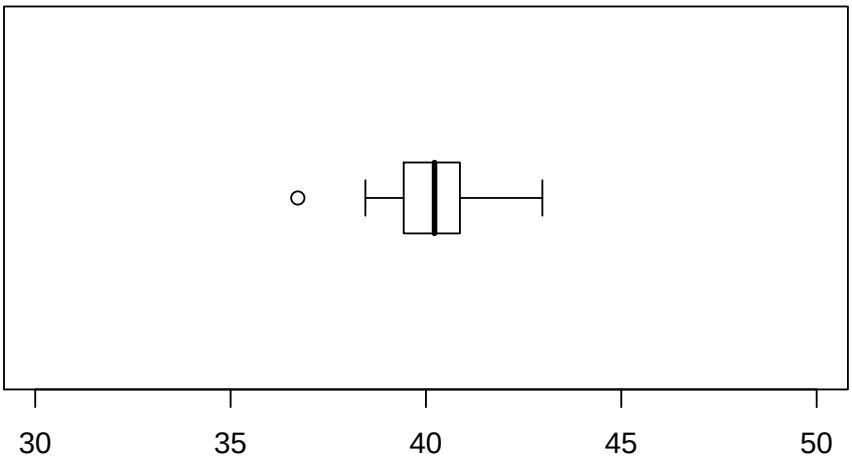
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 39.43 - 1.5 \times 1.44 \\ &= 37.27 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 40.87 + 1.5 \times 1.44 \\ &= 43.03 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{36.72\}$$

We identify the ends of the whiskers: 38.45 and 42.98. We plot the boxplot.



2. **Solution**
The sample size, n, is 45. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 45 \rceil$	12	25.55
Q2	$\lceil 0.5 \times 45 \rceil$	23	29.57
Q3	$\lceil 0.75 \times 45 \rceil$	34	34.81

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 34.81 - 25.55 \\ &= 9.26 \end{aligned}$$

We determine the outlier boundaries.

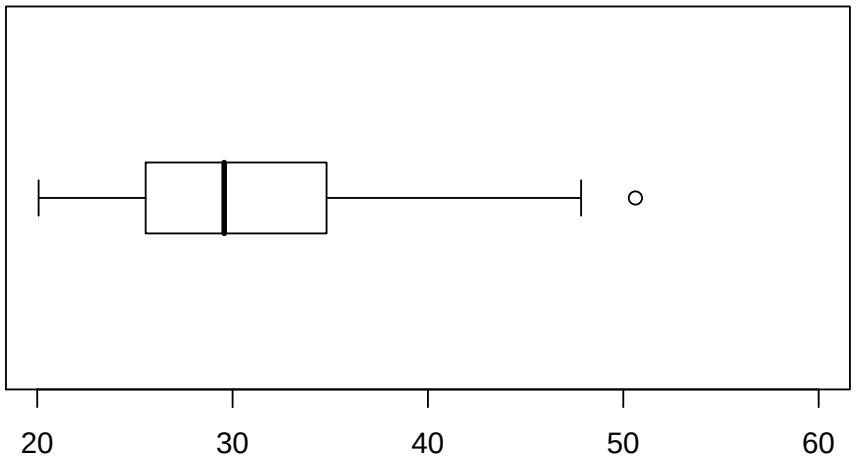
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 25.55 - 1.5 \times 9.26 \\ &= 11.66 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 34.81 + 1.5 \times 9.26 \\ &= 48.7 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{50.62\}$$

We identify the ends of the whiskers: 20.07 and 47.84. We plot the boxplot.



1. **Solution**
The sample size, n, is 32. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 32 \rceil$	8	52.31
Q2	$\lceil 0.5 \times 32 \rceil$	16	52.46
Q3	$\lceil 0.75 \times 32 \rceil$	24	52.67

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 52.67 - 52.31 \\ &= 0.36 \end{aligned}$$

We determine the outlier boundaries.

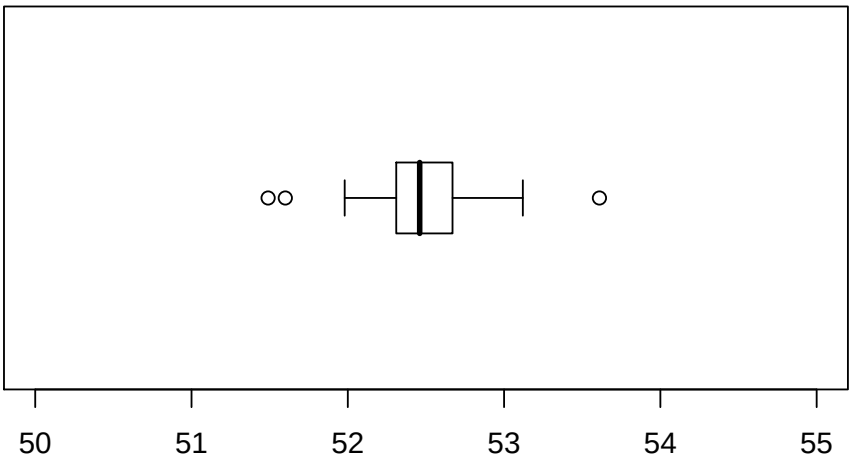
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 52.31 - 1.5 \times 0.36 \\ &= 51.77 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 52.67 + 1.5 \times 0.36 \\ &= 53.21 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{51.49, 51.6, 53.61\}$$

We identify the ends of the whiskers: 51.98 and 53.12. We plot the boxplot.



2. **Solution**
The sample size, n, is 15. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 15 \rceil$	4	49.19
Q2	$\lceil 0.5 \times 15 \rceil$	8	50.02
Q3	$\lceil 0.75 \times 15 \rceil$	12	53.06

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 53.06 - 49.19 \\ &= 3.87 \end{aligned}$$

We determine the outlier boundaries.

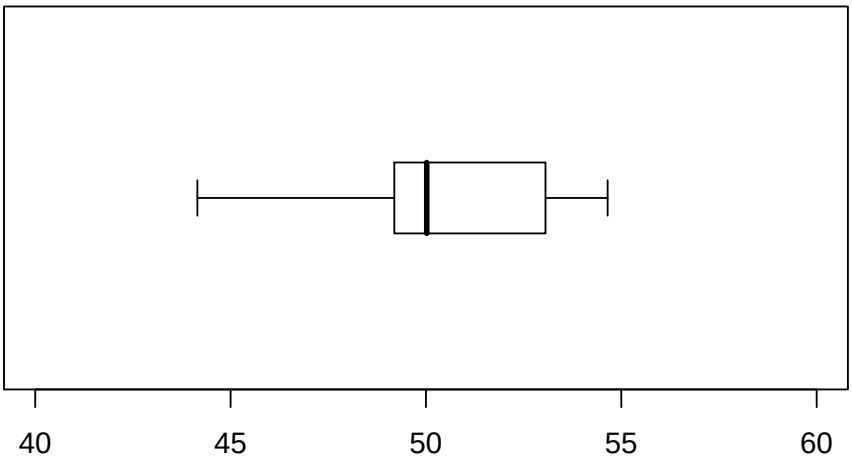
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 49.19 - 1.5 \times 3.87 \\ &= 43.385 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 53.06 + 1.5 \times 3.87 \\ &= 58.865 \end{aligned}$$

We determine the outliers.

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

We identify the ends of the whiskers: 44.15 and 54.65. We plot the boxplot.



1. **Solution**
The sample size, n, is 28. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 28 \rceil$	7	53.8
Q2	$\lceil 0.5 \times 28 \rceil$	14	57.25
Q3	$\lceil 0.75 \times 28 \rceil$	21	63.46

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 63.46 - 53.8 \\ &= 9.66 \end{aligned}$$

We determine the outlier boundaries.

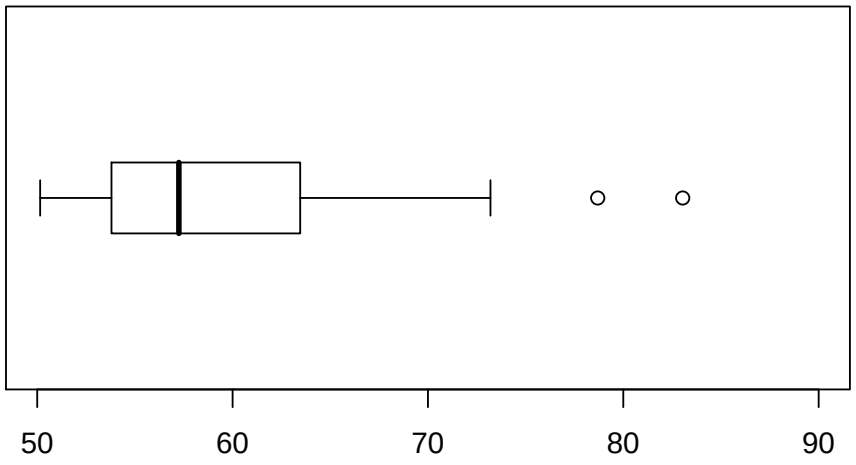
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 53.8 - 1.5 \times 9.66 \\ &= 39.31 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 63.46 + 1.5 \times 9.66 \\ &= 77.95 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{78.69, 83.04\}$$

We identify the ends of the whiskers: 50.15 and 73.2. We plot the boxplot.



2. **Solution**
The sample size, n, is 56. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 56 \rceil$	14	68.66
Q2	$\lceil 0.5 \times 56 \rceil$	28	70.24
Q3	$\lceil 0.75 \times 56 \rceil$	42	72.05

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 72.05 - 68.66 \\ &= 3.39 \end{aligned}$$

We determine the outlier boundaries.

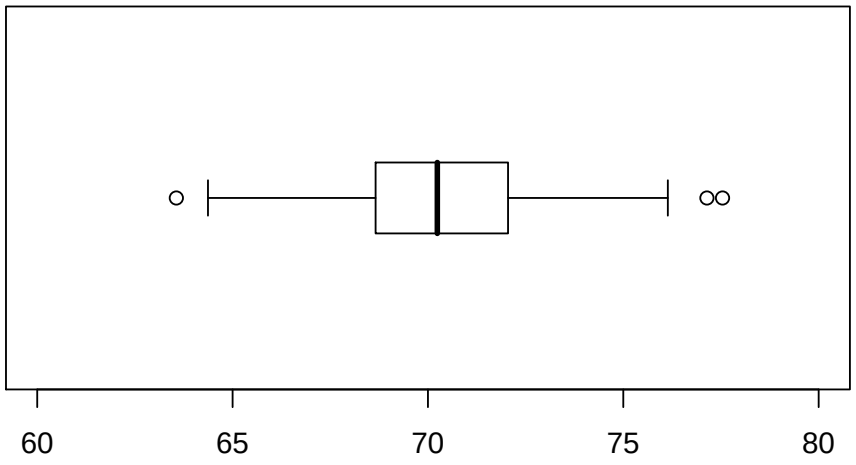
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 68.66 - 1.5 \times 3.39 \\ &= 63.575 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 72.05 + 1.5 \times 3.39 \\ &= 77.135 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{63.56, 77.14, 77.54\}$$

We identify the ends of the whiskers: 64.37 and 76.14. We plot the boxplot.



1. **Solution**
The sample size, n, is 15. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 15 \rceil$	4	44.07
Q2	$\lceil 0.5 \times 15 \rceil$	8	45.25
Q3	$\lceil 0.75 \times 15 \rceil$	12	48.16

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 48.16 - 44.07 \\ &= 4.09 \end{aligned}$$

We determine the outlier boundaries.

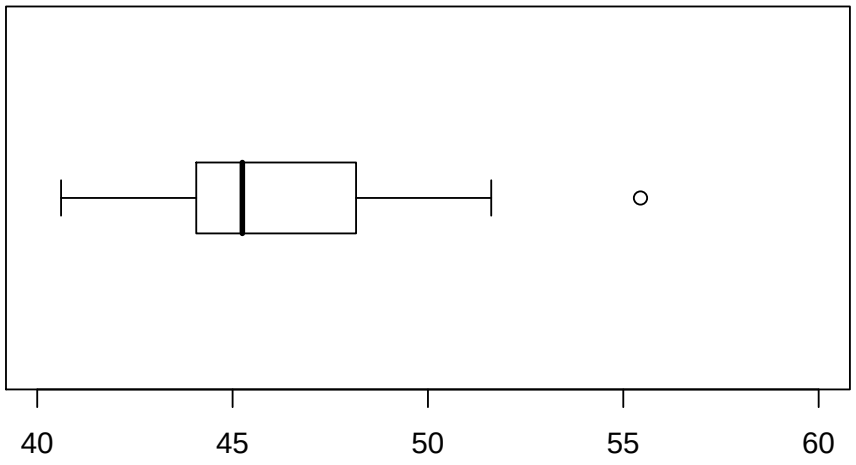
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 44.07 - 1.5 \times 4.09 \\ &= 37.935 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 48.16 + 1.5 \times 4.09 \\ &= 54.295 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{55.44\}$$

We identify the ends of the whiskers: 40.61 and 51.62. We plot the boxplot.



2. **Solution**
The sample size, n, is 35. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 35 \rceil$	9	37.73
Q2	$\lceil 0.5 \times 35 \rceil$	18	43.93
Q3	$\lceil 0.75 \times 35 \rceil$	27	45.87

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 45.87 - 37.73 \\ &= 8.14 \end{aligned}$$

We determine the outlier boundaries.

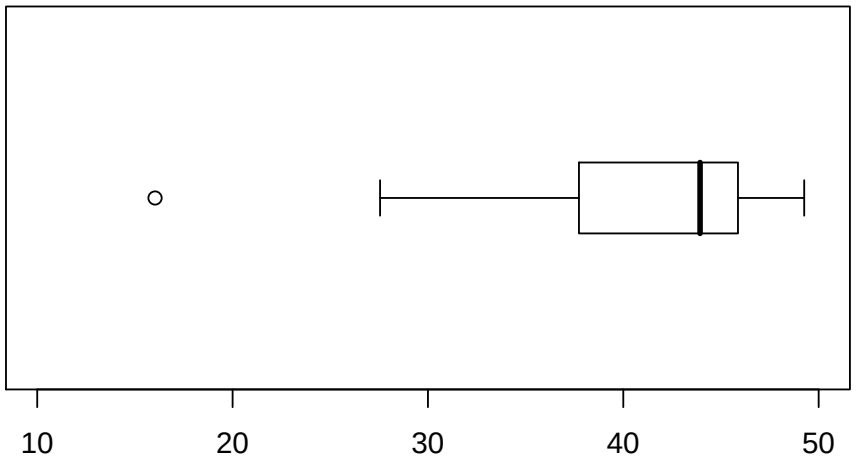
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 37.73 - 1.5 \times 8.14 \\ &= 25.52 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 45.87 + 1.5 \times 8.14 \\ &= 58.08 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{16.03\}$$

We identify the ends of the whiskers: 27.55 and 49.26. We plot the boxplot.



1. **Solution**
The sample size, n, is 25. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 25 \rceil$	7	60.86
Q2	$\lceil 0.5 \times 25 \rceil$	13	61.68
Q3	$\lceil 0.75 \times 25 \rceil$	19	62.82

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 62.82 - 60.86 \\ &= 1.96 \end{aligned}$$

We determine the outlier boundaries.

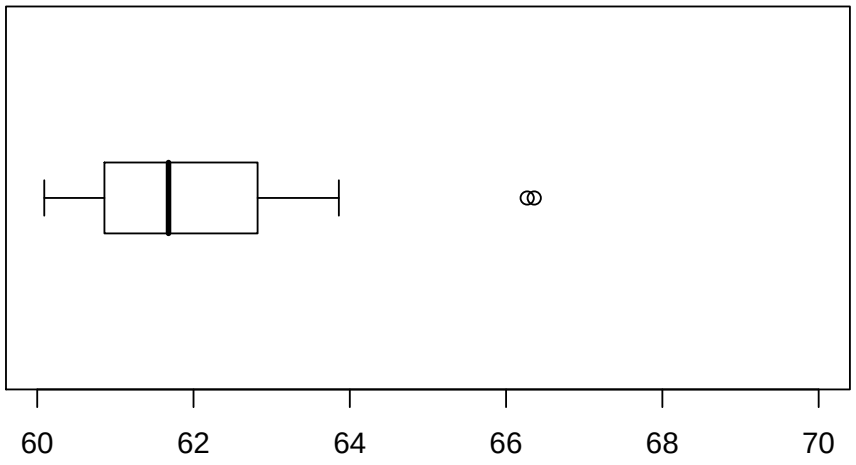
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 60.86 - 1.5 \times 1.96 \\ &= 57.92 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 62.82 + 1.5 \times 1.96 \\ &= 65.76 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{66.27, 66.36\}$$

We identify the ends of the whiskers: 60.09 and 63.86. We plot the boxplot.



2. **Solution**
The sample size, n, is 40. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 40 \rceil$	10	40.32
Q2	$\lceil 0.5 \times 40 \rceil$	20	40.91
Q3	$\lceil 0.75 \times 40 \rceil$	30	41.65

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 41.65 - 40.32 \\ &= 1.33 \end{aligned}$$

We determine the outlier boundaries.

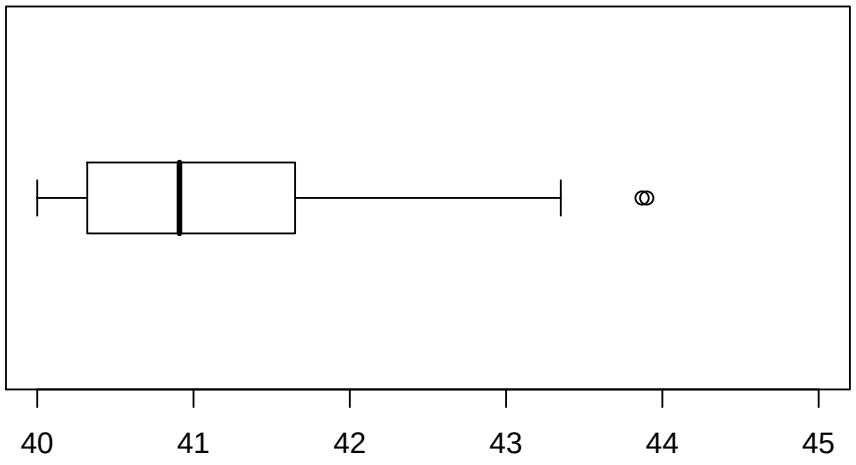
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 40.32 - 1.5 \times 1.33 \\ &= 38.325 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 41.65 + 1.5 \times 1.33 \\ &= 43.645 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{43.87, 43.9\}$$

We identify the ends of the whiskers: 40 and 43.35. We plot the boxplot.



1. **Solution**
The sample size, n, is 15. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 15 \rceil$	4	76.4
Q2	$\lceil 0.5 \times 15 \rceil$	8	77.99
Q3	$\lceil 0.75 \times 15 \rceil$	12	79.05

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 79.05 - 76.4 \\ &= 2.65 \end{aligned}$$

We determine the outlier boundaries.

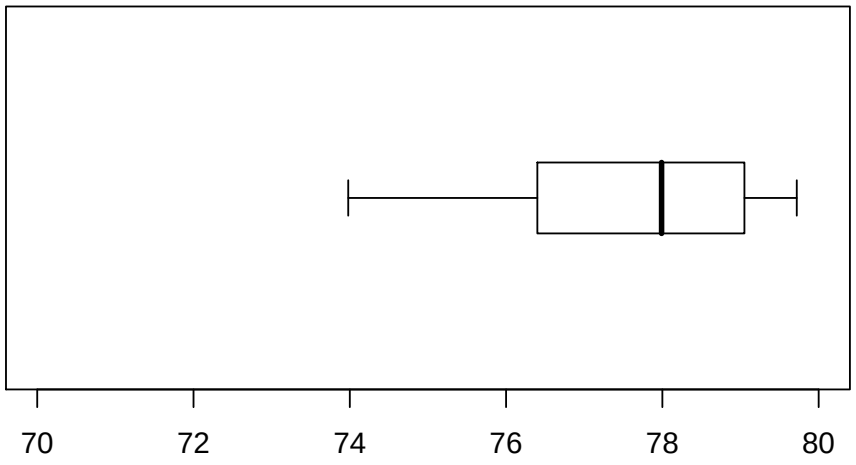
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 76.4 - 1.5 \times 2.65 \\ &= 72.425 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 79.05 + 1.5 \times 2.65 \\ &= 83.025 \end{aligned}$$

We determine the outliers.

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

We identify the ends of the whiskers: 73.98 and 79.72. We plot the boxplot.



2. **Solution**
The sample size, n, is 32. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 32 \rceil$	8	51.24
Q2	$\lceil 0.5 \times 32 \rceil$	16	52.49
Q3	$\lceil 0.75 \times 32 \rceil$	24	53.77

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 53.77 - 51.24 \\ &= 2.53 \end{aligned}$$

We determine the outlier boundaries.

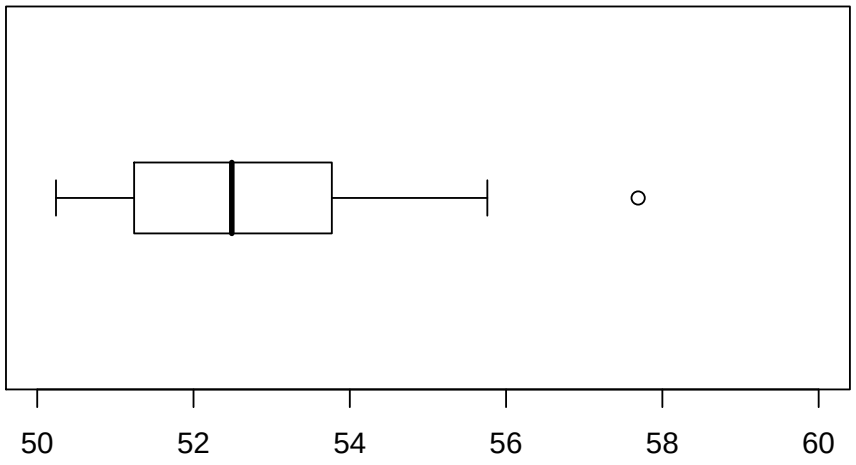
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 51.24 - 1.5 \times 2.53 \\ &= 47.445 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 53.77 + 1.5 \times 2.53 \\ &= 57.565 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{57.69\}$$

We identify the ends of the whiskers: 50.24 and 55.76. We plot the boxplot.



1. **Solution**
The sample size, n, is 32. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 32 \rceil$	8	42.37
Q2	$\lceil 0.5 \times 32 \rceil$	16	42.59
Q3	$\lceil 0.75 \times 32 \rceil$	24	42.68

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 42.68 - 42.37 \\ &= 0.31 \end{aligned}$$

We determine the outlier boundaries.

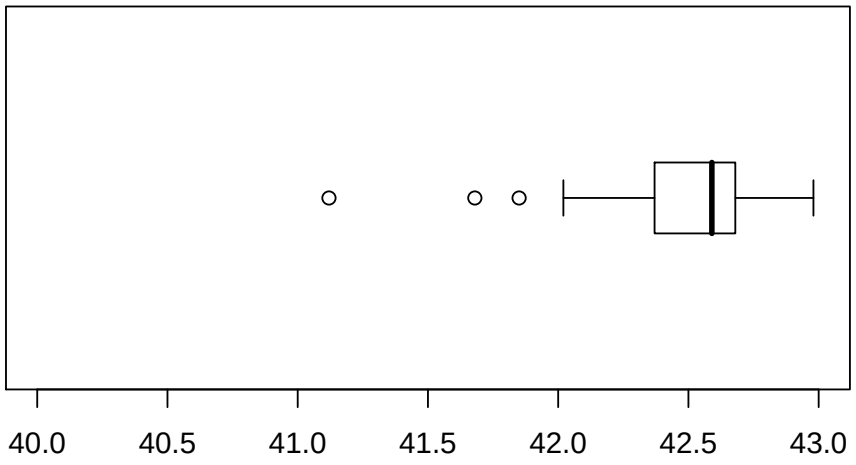
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 42.37 - 1.5 \times 0.31 \\ &= 41.905 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 42.68 + 1.5 \times 0.31 \\ &= 43.145 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{41.12, 41.68, 41.85\}$$

We identify the ends of the whiskers: 42.02 and 42.98. We plot the boxplot.



2. **Solution**
The sample size, n, is 63. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 63 \rceil$	16	77.6
Q2	$\lceil 0.5 \times 63 \rceil$	32	82.64
Q3	$\lceil 0.75 \times 63 \rceil$	48	85.3

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 85.3 - 77.6 \\ &= 7.7 \end{aligned}$$

We determine the outlier boundaries.

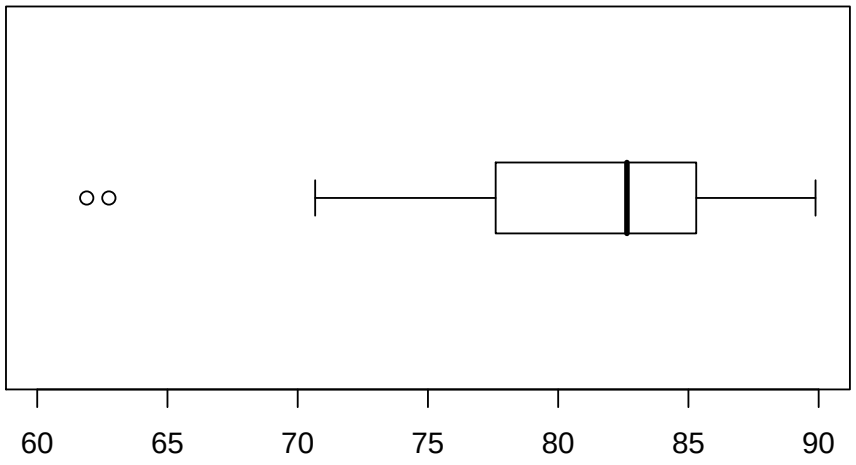
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 77.6 - 1.5 \times 7.7 \\ &= 66.05 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 85.3 + 1.5 \times 7.7 \\ &= 96.85 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{61.9, 62.75\}$$

We identify the ends of the whiskers: 70.67 and 89.88. We plot the boxplot.



1. **Solution**
The sample size, n, is 54. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 54 \rceil$	14	62.41
Q2	$\lceil 0.5 \times 54 \rceil$	27	63.88
Q3	$\lceil 0.75 \times 54 \rceil$	41	66.98

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 66.98 - 62.41 \\ &= 4.57 \end{aligned}$$

We determine the outlier boundaries.

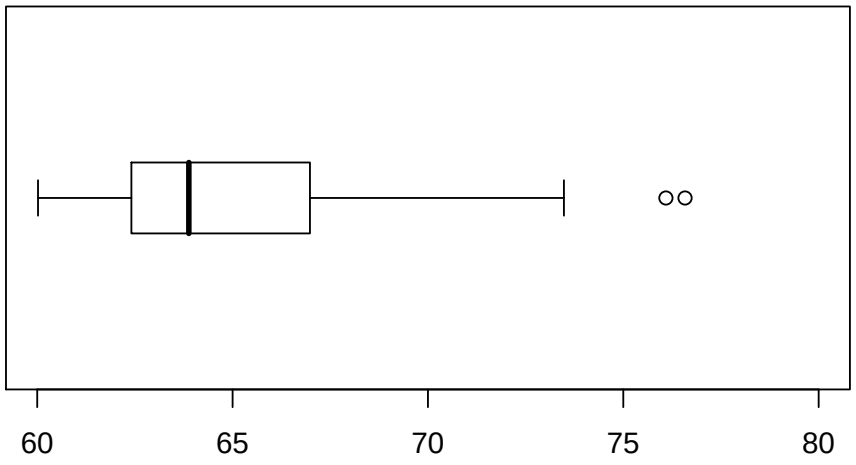
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 62.41 - 1.5 \times 4.57 \\ &= 55.555 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 66.98 + 1.5 \times 4.57 \\ &= 73.835 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{76.09, 76.58\}$$

We identify the ends of the whiskers: 60.02 and 73.48. We plot the boxplot.



2. **Solution**
The sample size, n, is 48. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 48 \rceil$	12	71.96
Q2	$\lceil 0.5 \times 48 \rceil$	24	90.31
Q3	$\lceil 0.75 \times 48 \rceil$	36	101.1

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 101.1 - 71.96 \\ &= 29.14 \end{aligned}$$

We determine the outlier boundaries.

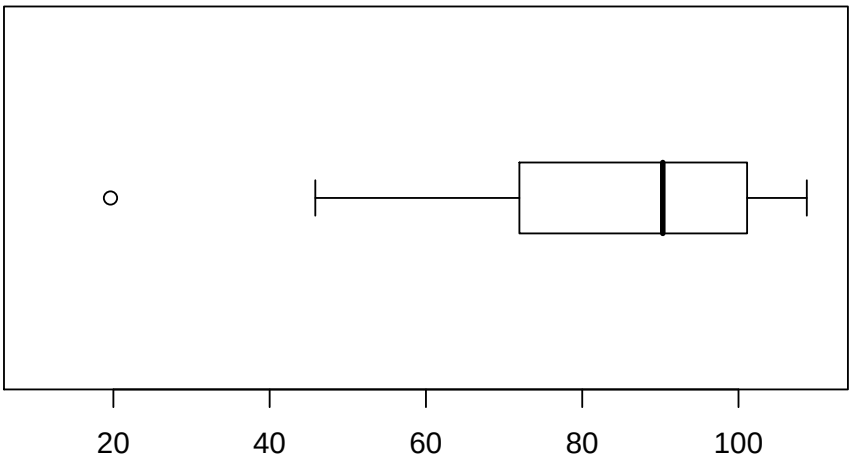
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 71.96 - 1.5 \times 29.14 \\ &= 28.25 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 101.1 + 1.5 \times 29.14 \\ &= 144.81 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{19.63\}$$

We identify the ends of the whiskers: 45.84 and 108.74. We plot the boxplot.



1. **Solution**
The sample size, n, is 63. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 63 \rceil$	16	32.97
Q2	$\lceil 0.5 \times 63 \rceil$	32	33.74
Q3	$\lceil 0.75 \times 63 \rceil$	48	34.43

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 34.43 - 32.97 \\ &= 1.46 \end{aligned}$$

We determine the outlier boundaries.

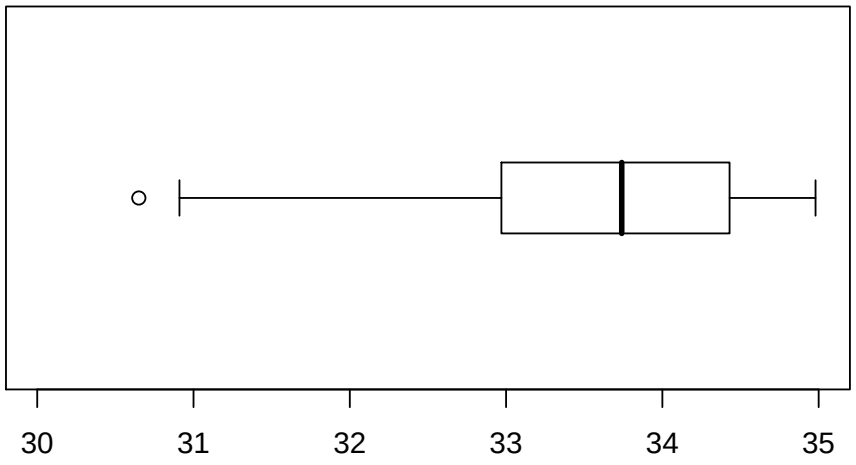
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 32.97 - 1.5 \times 1.46 \\ &= 30.78 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 34.43 + 1.5 \times 1.46 \\ &= 36.62 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{30.65\}$$

We identify the ends of the whiskers: 30.91 and 34.98. We plot the boxplot.



2. **Solution**
The sample size, n, is 72. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 72 \rceil$	18	43.15
Q2	$\lceil 0.5 \times 72 \rceil$	36	44.05
Q3	$\lceil 0.75 \times 72 \rceil$	54	44.59

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 44.59 - 43.15 \\ &= 1.44 \end{aligned}$$

We determine the outlier boundaries.

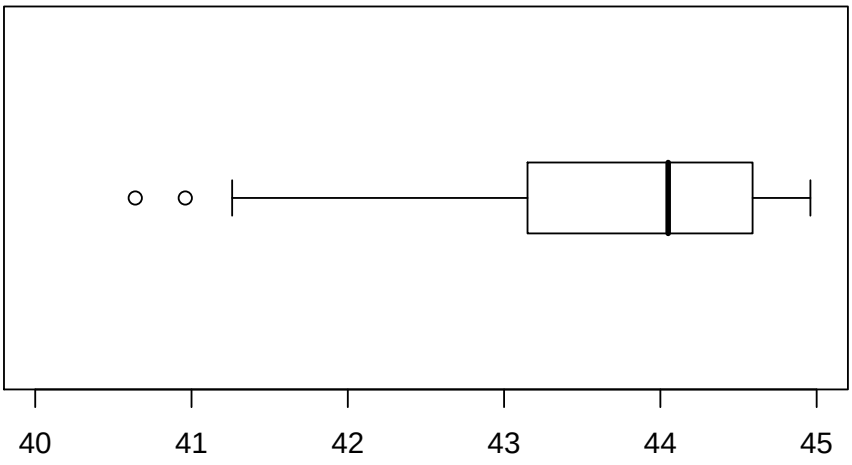
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 43.15 - 1.5 \times 1.44 \\ &= 40.99 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 44.59 + 1.5 \times 1.44 \\ &= 46.75 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{40.64, 40.96\}$$

We identify the ends of the whiskers: 41.26 and 44.96. We plot the boxplot.



1. **Solution**
The sample size, n, is 48. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 48 \rceil$	12	31.48
Q2	$\lceil 0.5 \times 48 \rceil$	24	33.49
Q3	$\lceil 0.75 \times 48 \rceil$	36	36.71

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 36.71 - 31.48 \\ &= 5.23 \end{aligned}$$

We determine the outlier boundaries.

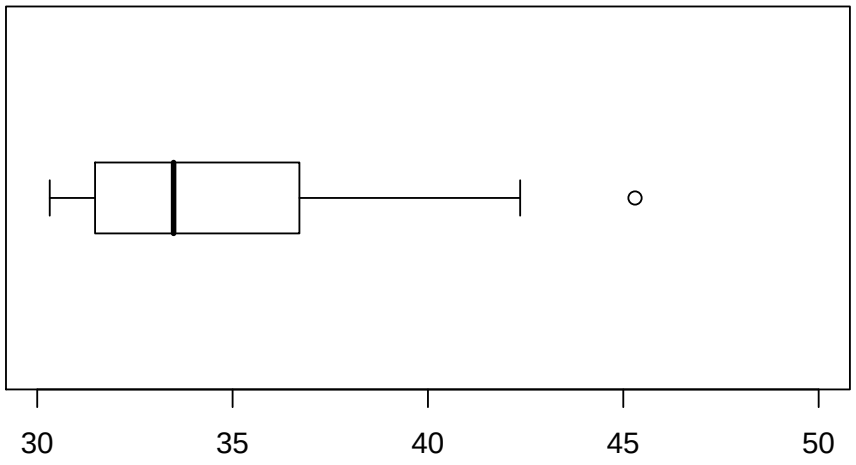
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 31.48 - 1.5 \times 5.23 \\ &= 23.635 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 36.71 + 1.5 \times 5.23 \\ &= 44.555 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{45.3\}$$

We identify the ends of the whiskers: 30.32 and 42.36. We plot the boxplot.



2. **Solution**
The sample size, n, is 25. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 25 \rceil$	7	83.17
Q2	$\lceil 0.5 \times 25 \rceil$	13	85.78
Q3	$\lceil 0.75 \times 25 \rceil$	19	87.76

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 87.76 - 83.17 \\ &= 4.59 \end{aligned}$$

We determine the outlier boundaries.

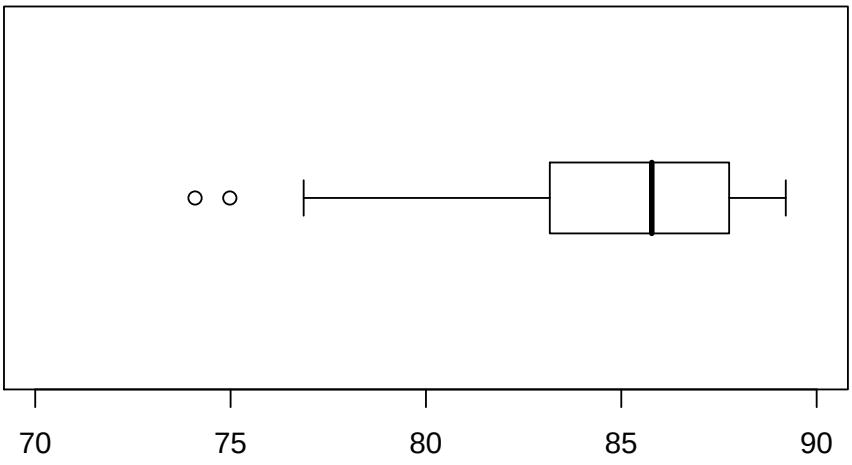
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 83.17 - 1.5 \times 4.59 \\ &= 76.285 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 87.76 + 1.5 \times 4.59 \\ &= 94.645 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{74.09, 74.98\}$$

We identify the ends of the whiskers: 76.87 and 89.21. We plot the boxplot.



1. **Solution**
The sample size, n, is 36. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 36 \rceil$	9	112.43
Q2	$\lceil 0.5 \times 36 \rceil$	18	117.77
Q3	$\lceil 0.75 \times 36 \rceil$	27	123.88

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 123.88 - 112.43 \\ &= 11.45 \end{aligned}$$

We determine the outlier boundaries.

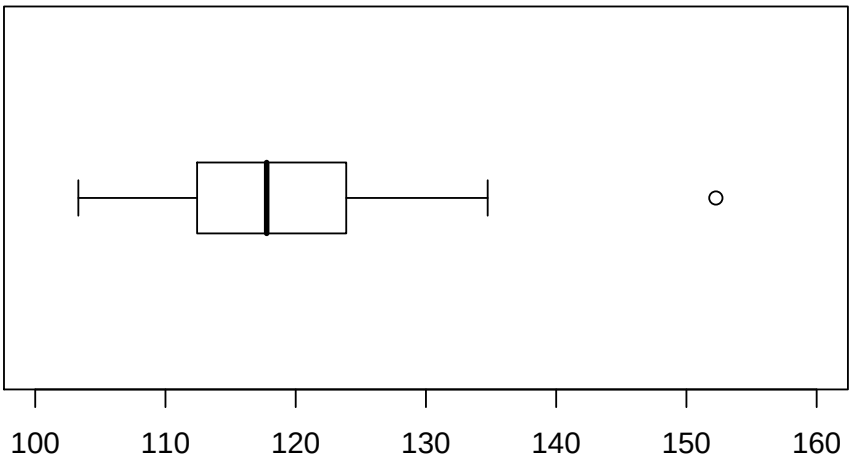
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 112.43 - 1.5 \times 11.45 \\ &= 95.255 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 123.88 + 1.5 \times 11.45 \\ &= 141.055 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{152.26\}$$

We identify the ends of the whiskers: 103.31 and 134.74. We plot the boxplot.



2. **Solution**
The sample size, n, is 24. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 24 \rceil$	6	76.61
Q2	$\lceil 0.5 \times 24 \rceil$	12	78
Q3	$\lceil 0.75 \times 24 \rceil$	18	78.98

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 78.98 - 76.61 \\ &= 2.37 \end{aligned}$$

We determine the outlier boundaries.

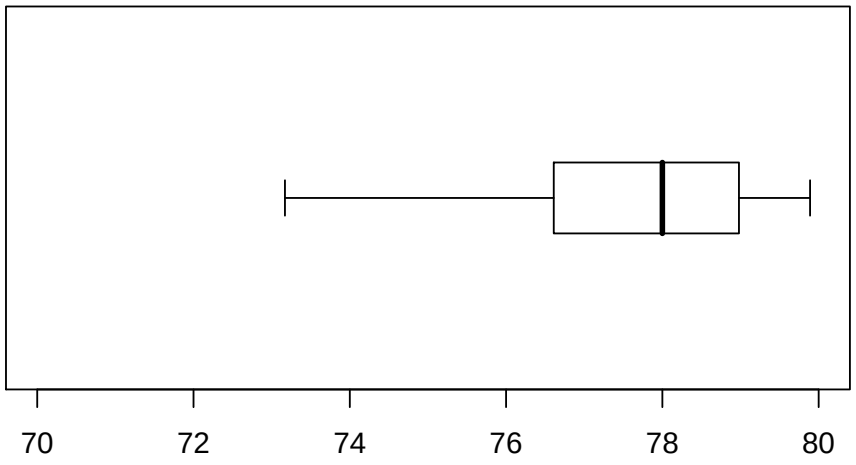
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 76.61 - 1.5 \times 2.37 \\ &= 73.055 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 78.98 + 1.5 \times 2.37 \\ &= 82.535 \end{aligned}$$

We determine the outliers.

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

We identify the ends of the whiskers: 73.17 and 79.89. We plot the boxplot.



1. **Solution**
The sample size, n, is 18. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 18 \rceil$	5	61.4
Q2	$\lceil 0.5 \times 18 \rceil$	9	61.54
Q3	$\lceil 0.75 \times 18 \rceil$	14	61.65

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 61.65 - 61.4 \\ &= 0.25 \end{aligned}$$

We determine the outlier boundaries.

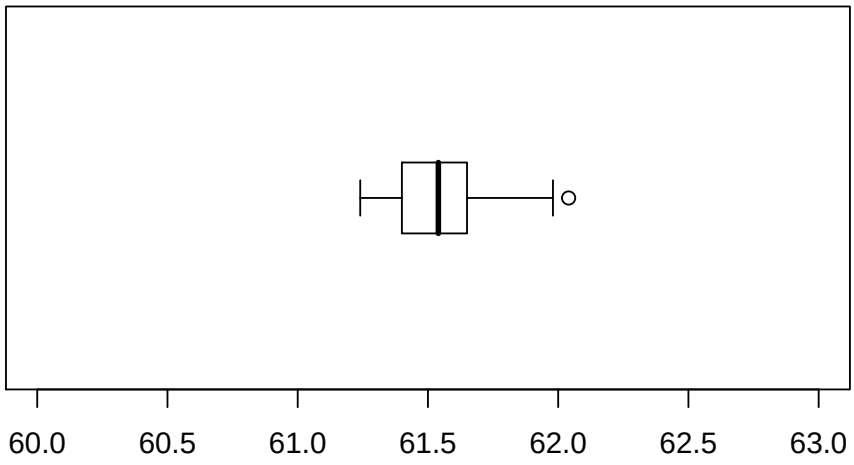
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 61.4 - 1.5 \times 0.25 \\ &= 61.025 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 61.65 + 1.5 \times 0.25 \\ &= 62.025 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{62.04\}$$

We identify the ends of the whiskers: 61.24 and 61.98. We plot the boxplot.



2. **Solution**
The sample size, n, is 21. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 21 \rceil$	6	54.65
Q2	$\lceil 0.5 \times 21 \rceil$	11	56.93
Q3	$\lceil 0.75 \times 21 \rceil$	16	58.48

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 58.48 - 54.65 \\ &= 3.83 \end{aligned}$$

We determine the outlier boundaries.

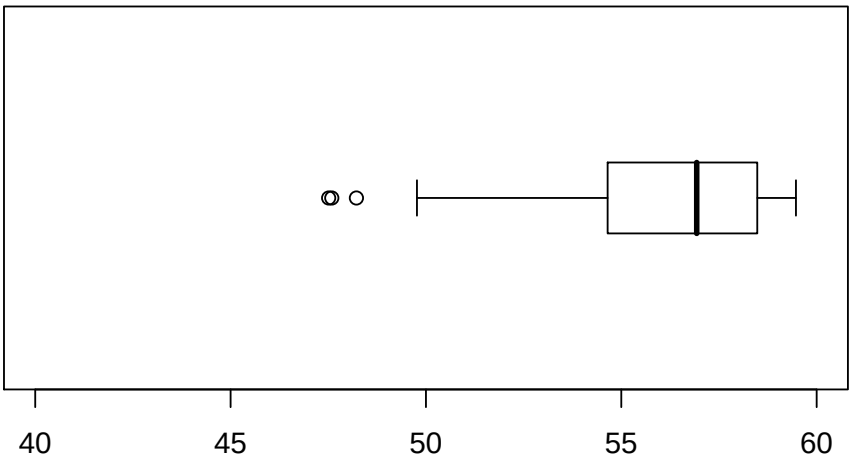
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 54.65 - 1.5 \times 3.83 \\ &= 48.905 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 58.48 + 1.5 \times 3.83 \\ &= 64.225 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{47.51, 47.59, 48.22\}$$

We identify the ends of the whiskers: 49.77 and 59.47. We plot the boxplot.



1. **Solution**
The sample size, n, is 54. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 54 \rceil$	14	45.69
Q2	$\lceil 0.5 \times 54 \rceil$	27	49.53
Q3	$\lceil 0.75 \times 54 \rceil$	41	55.82

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 55.82 - 45.69 \\ &= 10.13 \end{aligned}$$

We determine the outlier boundaries.

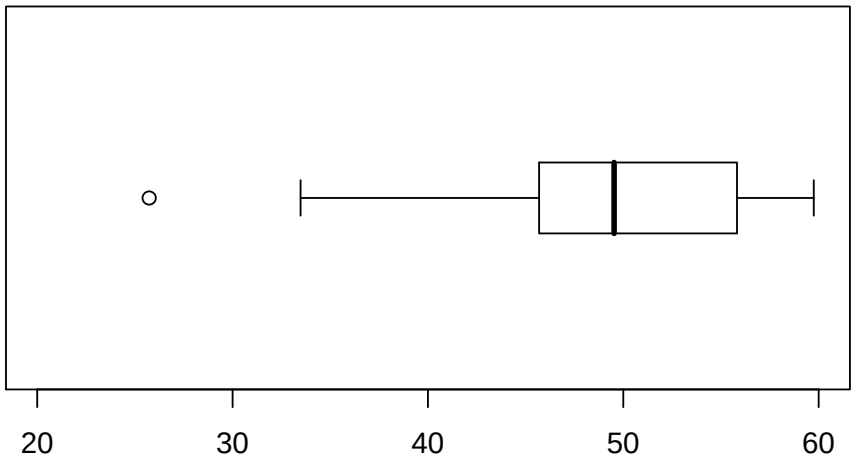
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 45.69 - 1.5 \times 10.13 \\ &= 30.495 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 55.82 + 1.5 \times 10.13 \\ &= 71.015 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{25.73\}$$

We identify the ends of the whiskers: 33.48 and 59.75. We plot the boxplot.



2. **Solution**
The sample size, n, is 21. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 21 \rceil$	6	66.54
Q2	$\lceil 0.5 \times 21 \rceil$	11	67.84
Q3	$\lceil 0.75 \times 21 \rceil$	16	73.88

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 73.88 - 66.54 \\ &= 7.34 \end{aligned}$$

We determine the outlier boundaries.

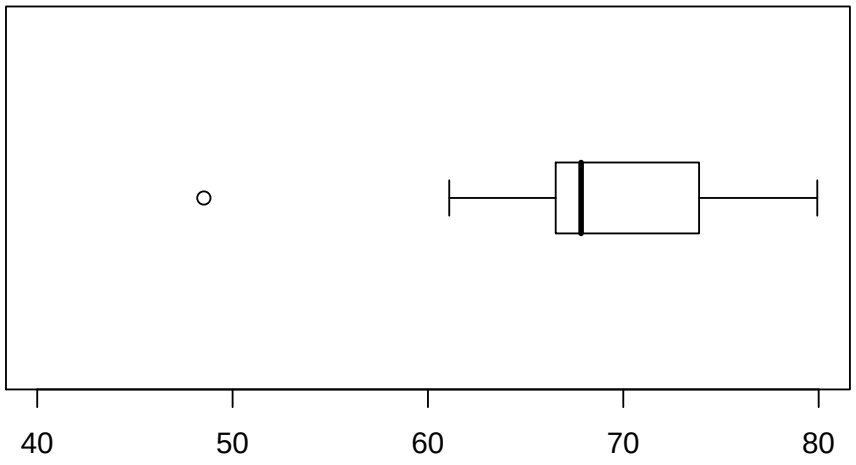
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 66.54 - 1.5 \times 7.34 \\ &= 55.53 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 73.88 + 1.5 \times 7.34 \\ &= 84.89 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{48.53\}$$

We identify the ends of the whiskers: 61.09 and 79.93. We plot the boxplot.



1. **Solution**
The sample size, n, is 12. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 12 \rceil$	3	83.15
Q2	$\lceil 0.5 \times 12 \rceil$	6	92.09
Q3	$\lceil 0.75 \times 12 \rceil$	9	102.85

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 102.85 - 83.15 \\ &= 19.7 \end{aligned}$$

We determine the outlier boundaries.

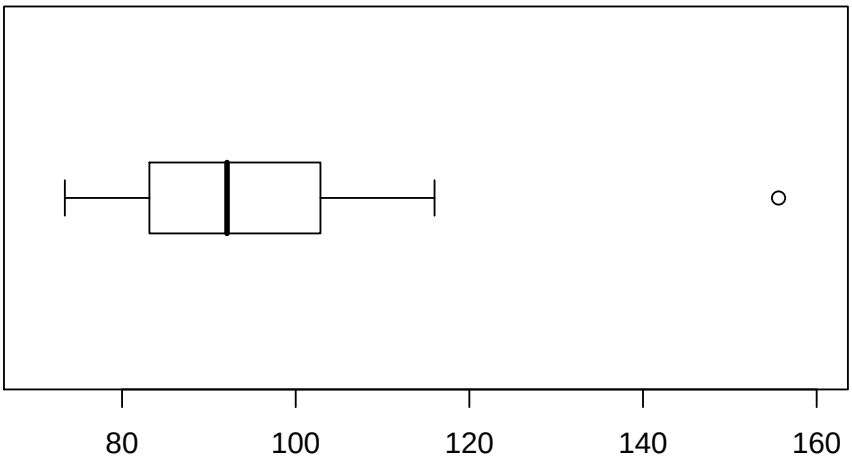
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 83.15 - 1.5 \times 19.7 \\ &= 53.6 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 102.85 + 1.5 \times 19.7 \\ &= 132.4 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{155.61\}$$

We identify the ends of the whiskers: 73.41 and 115.99. We plot the boxplot.



2. **Solution**
The sample size, n, is 72. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 72 \rceil$	18	29.19
Q2	$\lceil 0.5 \times 72 \rceil$	36	36.46
Q3	$\lceil 0.75 \times 72 \rceil$	54	53.68

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 53.68 - 29.19 \\ &= 24.49 \end{aligned}$$

We determine the outlier boundaries.

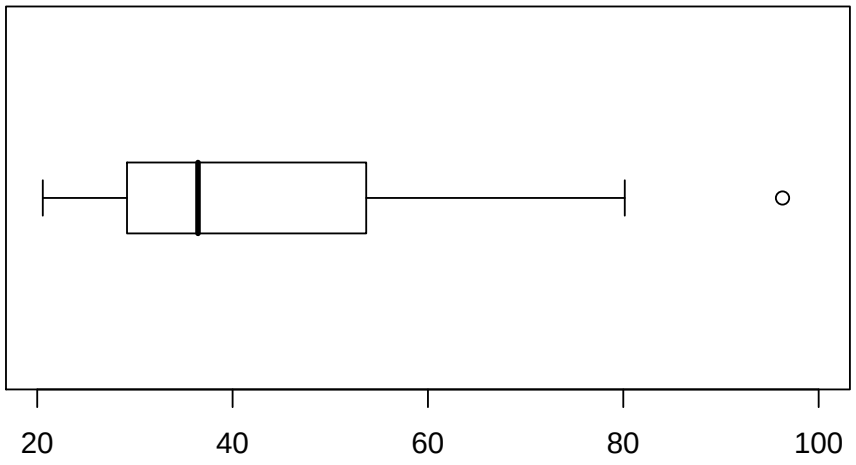
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 29.19 - 1.5 \times 24.49 \\ &= -7.545 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 53.68 + 1.5 \times 24.49 \\ &= 90.415 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{96.3\}$$

We identify the ends of the whiskers: 20.57 and 80.15. We plot the boxplot.



1. **Solution**
The sample size, n, is 72. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 72 \rceil$	18	92.55
Q2	$\lceil 0.5 \times 72 \rceil$	36	107.62
Q3	$\lceil 0.75 \times 72 \rceil$	54	120.44

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 120.44 - 92.55 \\ &= 27.89 \end{aligned}$$

We determine the outlier boundaries.

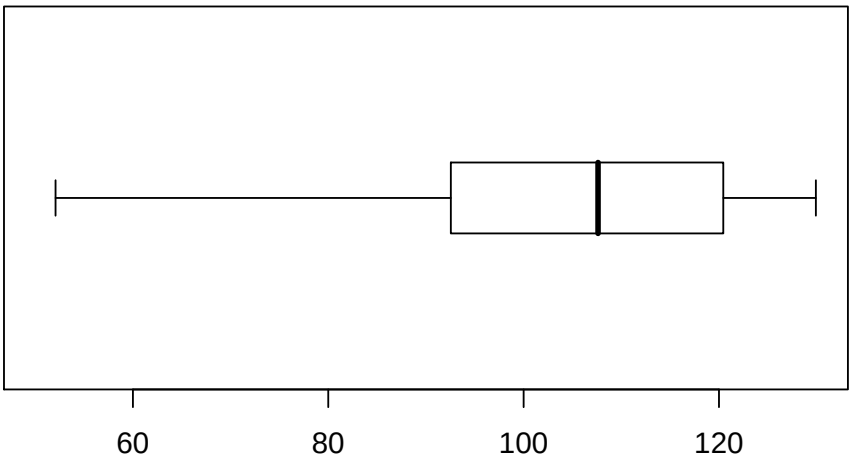
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 92.55 - 1.5 \times 27.89 \\ &= 50.715 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 120.44 + 1.5 \times 27.89 \\ &= 162.275 \end{aligned}$$

We determine the outliers.

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

We identify the ends of the whiskers: 52.08 and 129.92. We plot the boxplot.



2. **Solution**
The sample size, n, is 56. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 56 \rceil$	14	11.94
Q2	$\lceil 0.5 \times 56 \rceil$	28	12.41
Q3	$\lceil 0.75 \times 56 \rceil$	42	12.74

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 12.74 - 11.94 \\ &= 0.8 \end{aligned}$$

We determine the outlier boundaries.

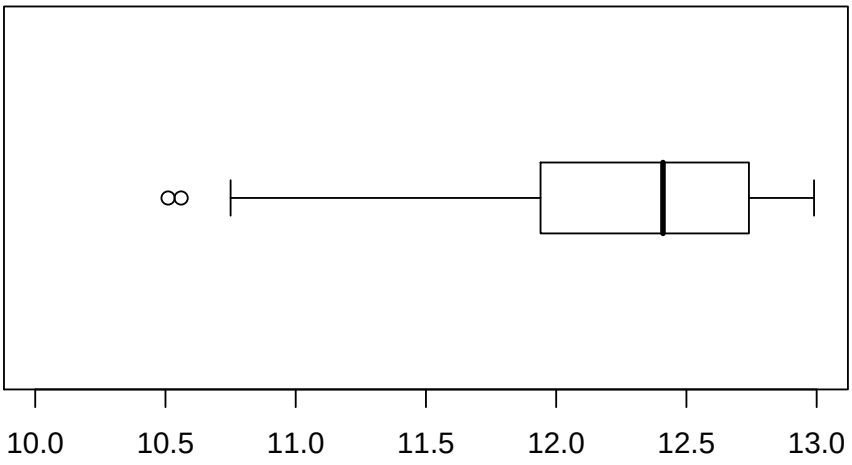
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 11.94 - 1.5 \times 0.8 \\ &= 10.74 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 12.74 + 1.5 \times 0.8 \\ &= 13.94 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{10.51, 10.56\}$$

We identify the ends of the whiskers: 10.75 and 12.99. We plot the boxplot.



1. **Solution**
The sample size, n, is 54. We determine the indeces 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.

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

We determine the outlier boundaries.

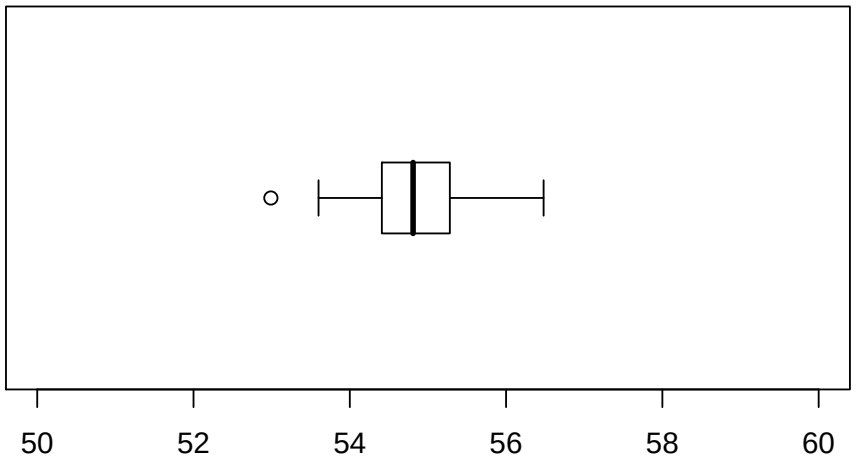
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 54.41 - 1.5 \times 0.87 \\ &= 53.105 \end{aligned}$$

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

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 indeces 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.

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

We determine the outlier boundaries.

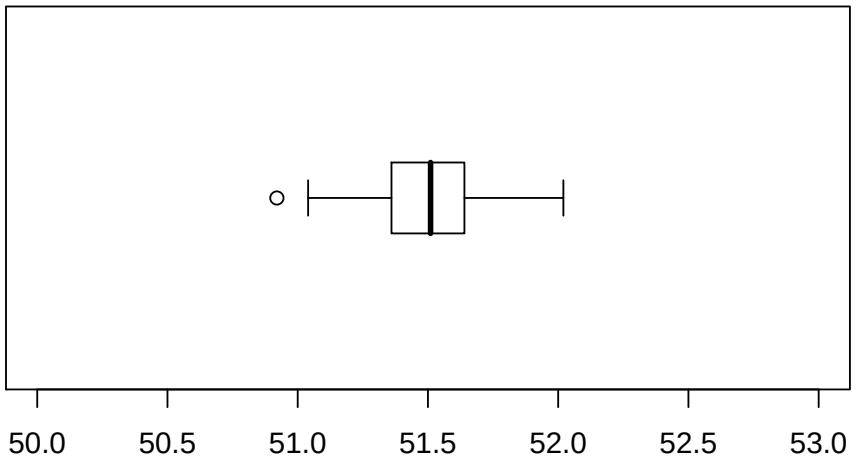
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 51.36 - 1.5 \times 0.28 \\ &= 50.94 \end{aligned}$$

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

We determine the outliers.

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

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



1. **Solution**
The sample size, n, is 24. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 24 \rceil$	6	51.45
Q2	$\lceil 0.5 \times 24 \rceil$	12	51.57
Q3	$\lceil 0.75 \times 24 \rceil$	18	51.71

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 51.71 - 51.45 \\ &= 0.26 \end{aligned}$$

We determine the outlier boundaries.

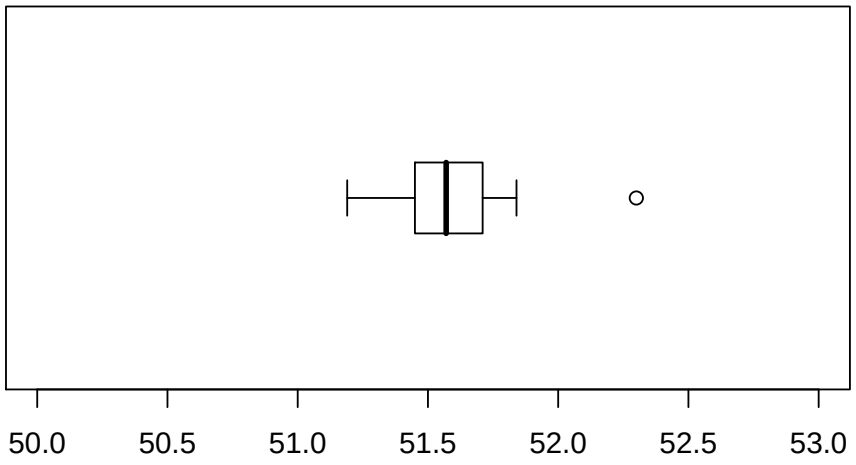
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 51.45 - 1.5 \times 0.26 \\ &= 51.06 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 51.71 + 1.5 \times 0.26 \\ &= 52.1 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{52.3\}$$

We identify the ends of the whiskers: 51.19 and 51.84. We plot the boxplot.



2. **Solution**
The sample size, n, is 28. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 28 \rceil$	7	53.31
Q2	$\lceil 0.5 \times 28 \rceil$	14	56.66
Q3	$\lceil 0.75 \times 28 \rceil$	21	62.35

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 62.35 - 53.31 \\ &= 9.04 \end{aligned}$$

We determine the outlier boundaries.

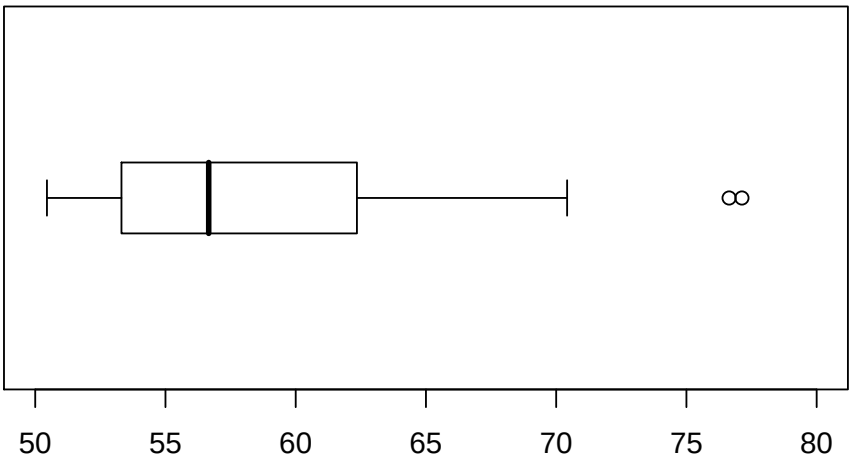
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 53.31 - 1.5 \times 9.04 \\ &= 39.75 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 62.35 + 1.5 \times 9.04 \\ &= 75.91 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{76.64, 77.13\}$$

We identify the ends of the whiskers: 50.45 and 70.42. We plot the boxplot.



1. **Solution**
The sample size, n, is 30. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 30 \rceil$	8	53.42
Q2	$\lceil 0.5 \times 30 \rceil$	15	54.03
Q3	$\lceil 0.75 \times 30 \rceil$	23	54.72

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 54.72 - 53.42 \\ &= 1.3 \end{aligned}$$

We determine the outlier boundaries.

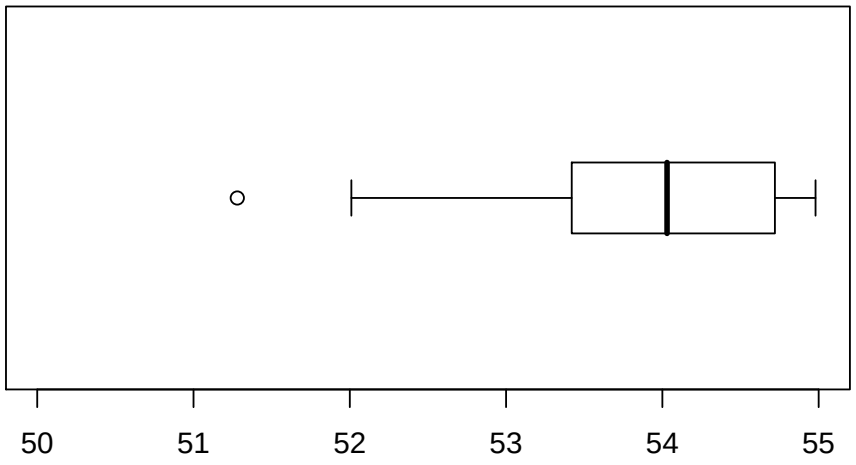
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 53.42 - 1.5 \times 1.3 \\ &= 51.47 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 54.72 + 1.5 \times 1.3 \\ &= 56.67 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{51.28\}$$

We identify the ends of the whiskers: 52.01 and 54.98. We plot the boxplot.



2. **Solution**
The sample size, n, is 54. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 54 \rceil$	14	12.24
Q2	$\lceil 0.5 \times 54 \rceil$	27	12.49
Q3	$\lceil 0.75 \times 54 \rceil$	41	12.75

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 12.75 - 12.24 \\ &= 0.51 \end{aligned}$$

We determine the outlier boundaries.

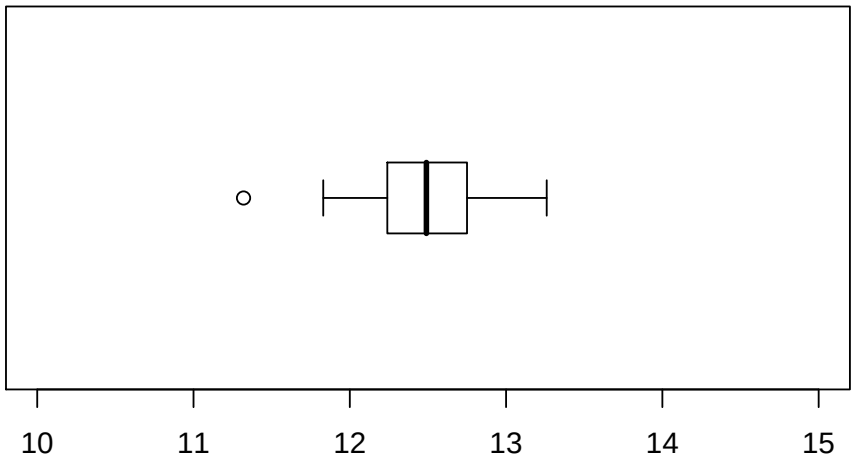
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 12.24 - 1.5 \times 0.51 \\ &= 11.475 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 12.75 + 1.5 \times 0.51 \\ &= 13.515 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{11.32\}$$

We identify the ends of the whiskers: 11.83 and 13.26. We plot the boxplot.



1. **Solution**
The sample size, n, is 20. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 20 \rceil$	5	54.53
Q2	$\lceil 0.5 \times 20 \rceil$	10	54.92
Q3	$\lceil 0.75 \times 20 \rceil$	15	55.45

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 55.45 - 54.53 \\ &= 0.92 \end{aligned}$$

We determine the outlier boundaries.

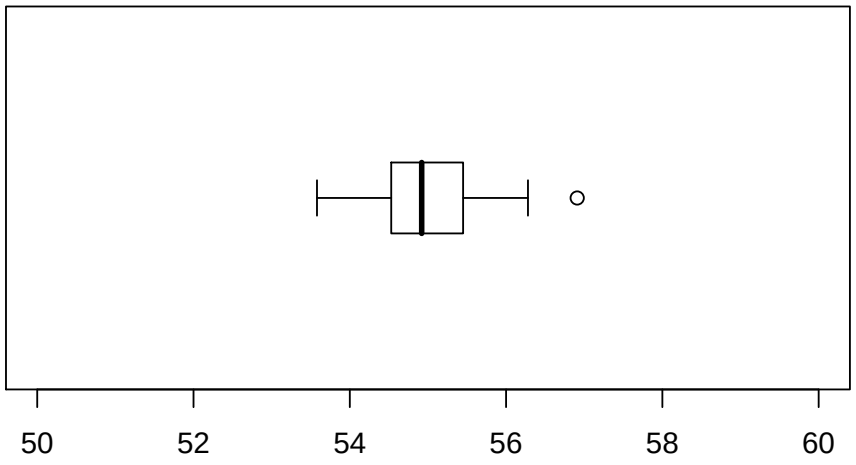
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 54.53 - 1.5 \times 0.92 \\ &= 53.15 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 55.45 + 1.5 \times 0.92 \\ &= 56.83 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{56.91\}$$

We identify the ends of the whiskers: 53.58 and 56.28. We plot the boxplot.



2. **Solution**
The sample size, n, is 27. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 27 \rceil$	7	10.21
Q2	$\lceil 0.5 \times 27 \rceil$	14	10.56
Q3	$\lceil 0.75 \times 27 \rceil$	21	10.89

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 10.89 - 10.21 \\ &= 0.68 \end{aligned}$$

We determine the outlier boundaries.

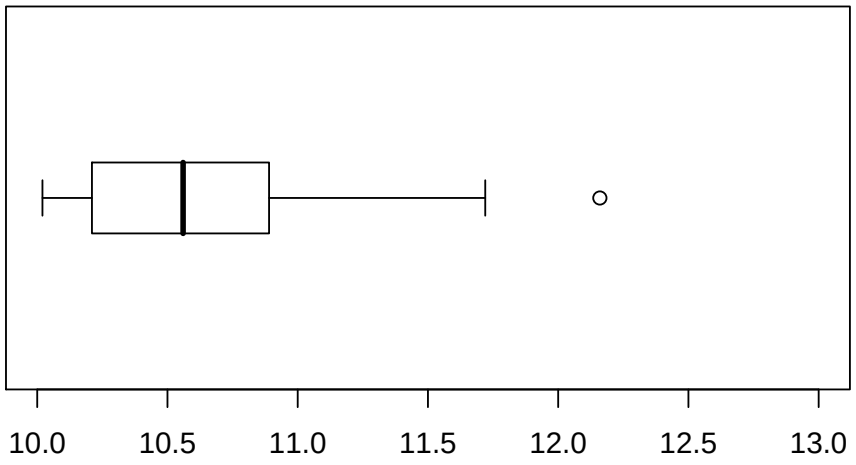
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 10.21 - 1.5 \times 0.68 \\ &= 9.19 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 10.89 + 1.5 \times 0.68 \\ &= 11.91 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{12.16\}$$

We identify the ends of the whiskers: 10.02 and 11.72. We plot the boxplot.



1. **Solution**
The sample size, n, is 56. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 56 \rceil$	14	33.23
Q2	$\lceil 0.5 \times 56 \rceil$	28	34.14
Q3	$\lceil 0.75 \times 56 \rceil$	42	34.7

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 34.7 - 33.23 \\ &= 1.47 \end{aligned}$$

We determine the outlier boundaries.

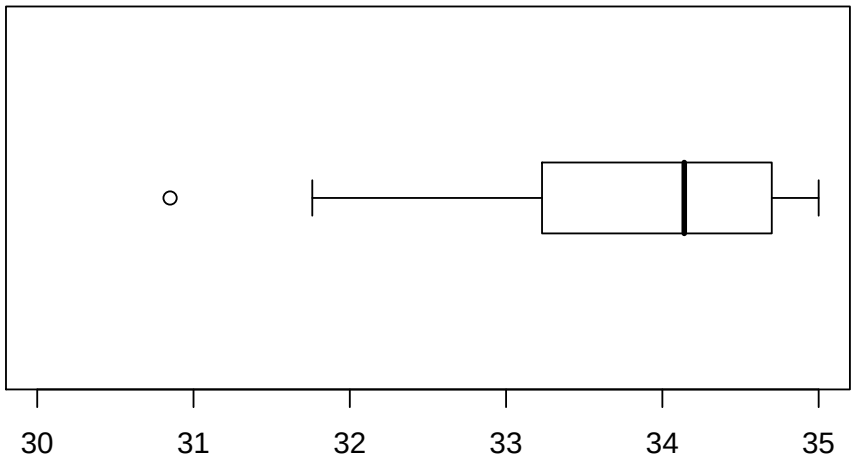
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 33.23 - 1.5 \times 1.47 \\ &= 31.025 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 34.7 + 1.5 \times 1.47 \\ &= 36.905 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{30.85\}$$

We identify the ends of the whiskers: 31.76 and 35. We plot the boxplot.



2. **Solution**
The sample size, n, is 56. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 56 \rceil$	14	28.05
Q2	$\lceil 0.5 \times 56 \rceil$	28	30.11
Q3	$\lceil 0.75 \times 56 \rceil$	42	31.76

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 31.76 - 28.05 \\ &= 3.71 \end{aligned}$$

We determine the outlier boundaries.

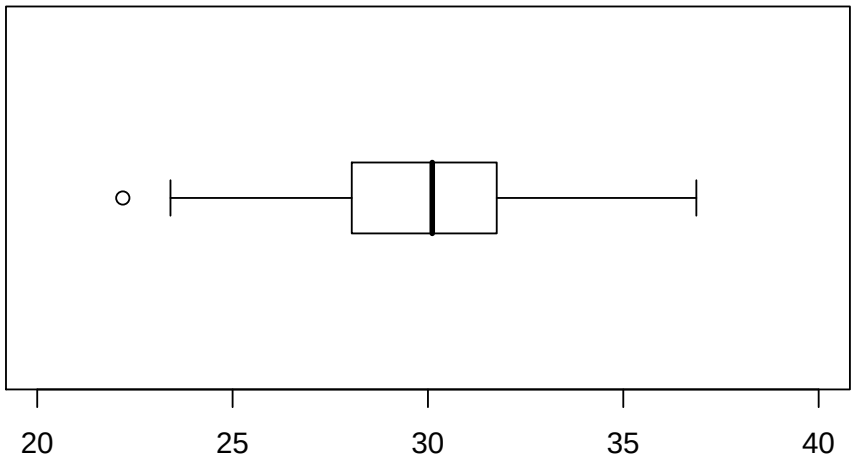
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 28.05 - 1.5 \times 3.71 \\ &= 22.485 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 31.76 + 1.5 \times 3.71 \\ &= 37.325 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{22.19\}$$

We identify the ends of the whiskers: 23.41 and 36.87. We plot the boxplot.



1. **Solution**
The sample size, n, is 35. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 35 \rceil$	9	62.58
Q2	$\lceil 0.5 \times 35 \rceil$	18	63.61
Q3	$\lceil 0.75 \times 35 \rceil$	27	65.14

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 65.14 - 62.58 \\ &= 2.56 \end{aligned}$$

We determine the outlier boundaries.

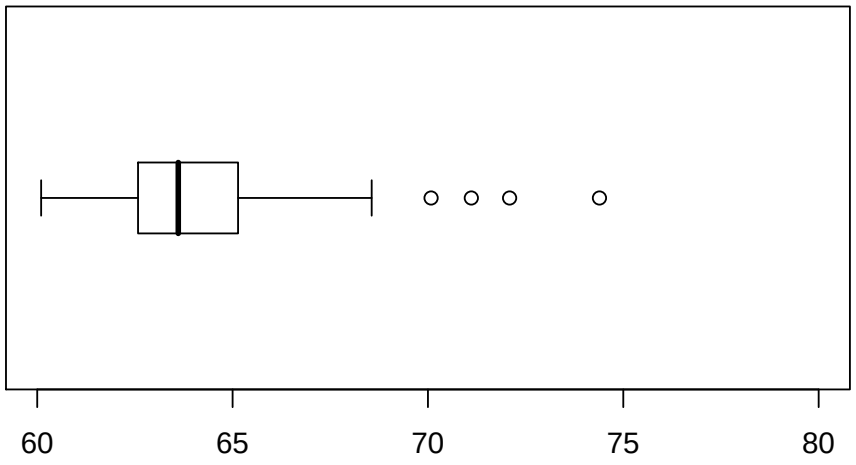
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 62.58 - 1.5 \times 2.56 \\ &= 58.74 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 65.14 + 1.5 \times 2.56 \\ &= 68.98 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{70.08, 71.11, 72.09, 74.39\}$$

We identify the ends of the whiskers: 60.1 and 68.56. We plot the boxplot.



2. **Solution**
The sample size, n, is 56. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 56 \rceil$	14	67.53
Q2	$\lceil 0.5 \times 56 \rceil$	28	69.86
Q3	$\lceil 0.75 \times 56 \rceil$	42	71.43

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 71.43 - 67.53 \\ &= 3.9 \end{aligned}$$

We determine the outlier boundaries.

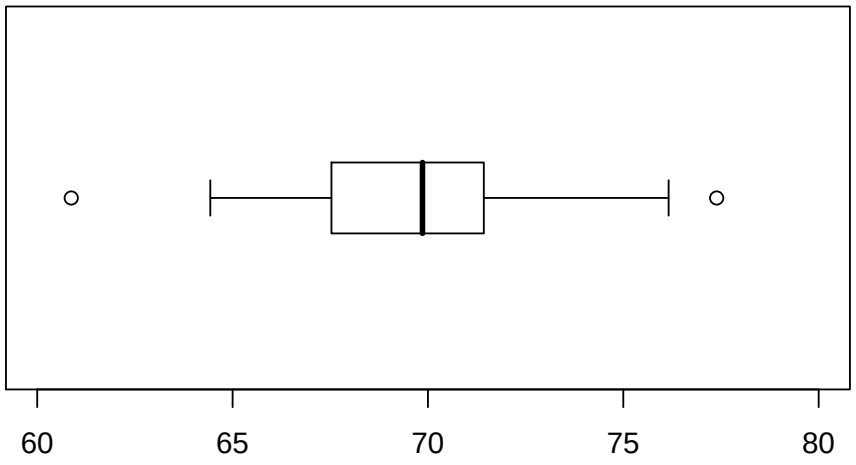
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 67.53 - 1.5 \times 3.9 \\ &= 61.68 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 71.43 + 1.5 \times 3.9 \\ &= 77.28 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{60.87, 77.39\}$$

We identify the ends of the whiskers: 64.43 and 76.16. We plot the boxplot.



1. **Solution**
The sample size, n, is 21. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 21 \rceil$	6	63.55
Q2	$\lceil 0.5 \times 21 \rceil$	11	64.03
Q3	$\lceil 0.75 \times 21 \rceil$	16	64.33

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 64.33 - 63.55 \\ &= 0.78 \end{aligned}$$

We determine the outlier boundaries.

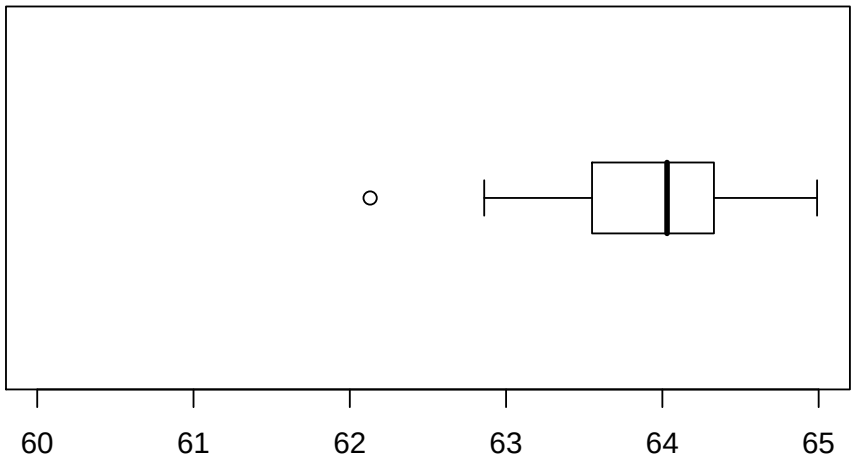
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 63.55 - 1.5 \times 0.78 \\ &= 62.38 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 64.33 + 1.5 \times 0.78 \\ &= 65.5 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{62.13\}$$

We identify the ends of the whiskers: 62.86 and 64.99. We plot the boxplot.



2. **Solution**
The sample size, n, is 36. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 36 \rceil$	9	54.65
Q2	$\lceil 0.5 \times 36 \rceil$	18	55.17
Q3	$\lceil 0.75 \times 36 \rceil$	27	55.73

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 55.73 - 54.65 \\ &= 1.08 \end{aligned}$$

We determine the outlier boundaries.

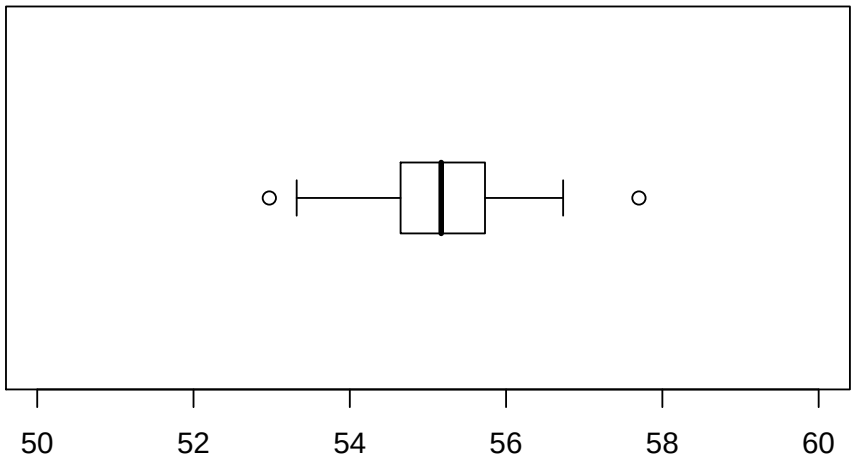
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 54.65 - 1.5 \times 1.08 \\ &= 53.03 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 55.73 + 1.5 \times 1.08 \\ &= 57.35 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{52.97, 57.7\}$$

We identify the ends of the whiskers: 53.32 and 56.73. We plot the boxplot.



1. **Solution**
The sample size, n, is 30. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 30 \rceil$	8	34.65
Q2	$\lceil 0.5 \times 30 \rceil$	15	35.29
Q3	$\lceil 0.75 \times 30 \rceil$	23	35.62

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 35.62 - 34.65 \\ &= 0.97 \end{aligned}$$

We determine the outlier boundaries.

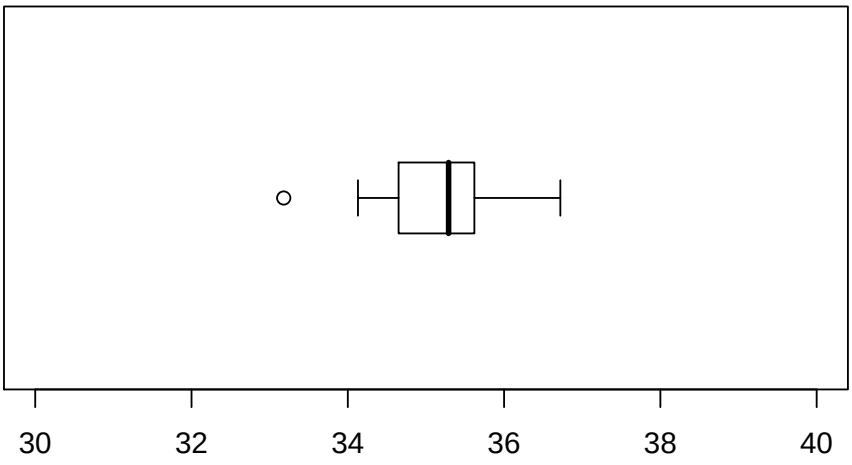
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 34.65 - 1.5 \times 0.97 \\ &= 33.195 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 35.62 + 1.5 \times 0.97 \\ &= 37.075 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{33.18\}$$

We identify the ends of the whiskers: 34.13 and 36.72. We plot the boxplot.



2. **Solution**
The sample size, n, is 72. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 72 \rceil$	18	63.2
Q2	$\lceil 0.5 \times 72 \rceil$	36	64.03
Q3	$\lceil 0.75 \times 72 \rceil$	54	64.59

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 64.59 - 63.2 \\ &= 1.39 \end{aligned}$$

We determine the outlier boundaries.

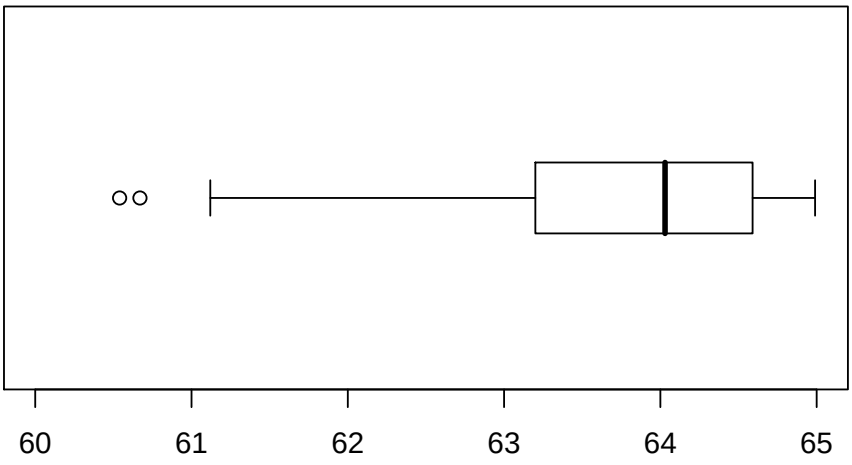
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 63.2 - 1.5 \times 1.39 \\ &= 61.115 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 64.59 + 1.5 \times 1.39 \\ &= 66.675 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{60.54, 60.67\}$$

We identify the ends of the whiskers: 61.12 and 64.99. We plot the boxplot.



1. **Solution**
The sample size, n, is 24. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 24 \rceil$	6	38.83
Q2	$\lceil 0.5 \times 24 \rceil$	12	39.58
Q3	$\lceil 0.75 \times 24 \rceil$	18	40.87

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 40.87 - 38.83 \\ &= 2.04 \end{aligned}$$

We determine the outlier boundaries.

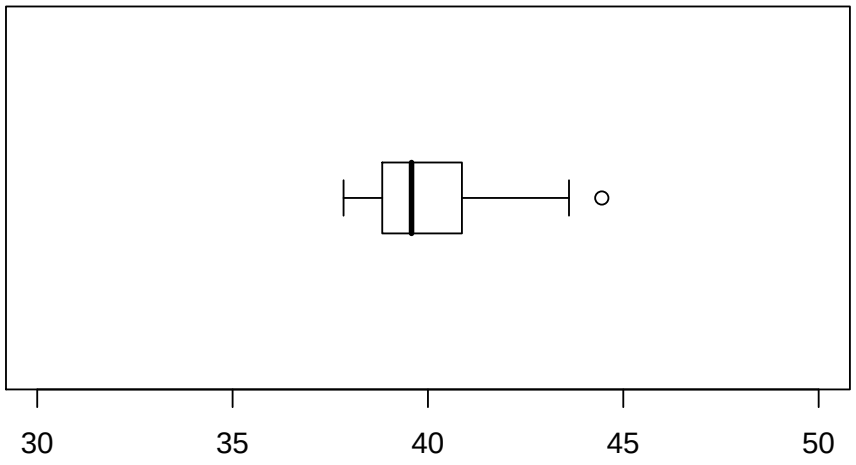
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 38.83 - 1.5 \times 2.04 \\ &= 35.77 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 40.87 + 1.5 \times 2.04 \\ &= 43.93 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{44.45\}$$

We identify the ends of the whiskers: 37.84 and 43.61. We plot the boxplot.



2. **Solution**
The sample size, n, is 18. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 18 \rceil$	5	116.73
Q2	$\lceil 0.5 \times 18 \rceil$	9	123.27
Q3	$\lceil 0.75 \times 18 \rceil$	14	126.1

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 126.1 - 116.73 \\ &= 9.37 \end{aligned}$$

We determine the outlier boundaries.

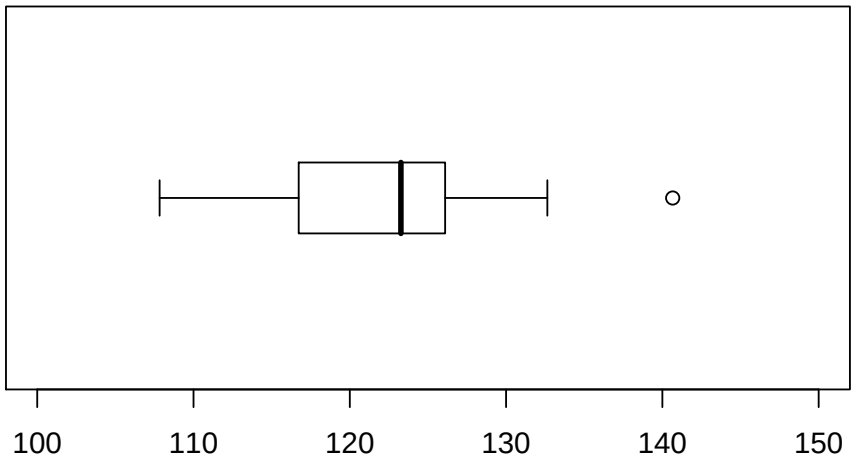
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 116.73 - 1.5 \times 9.37 \\ &= 102.675 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 126.1 + 1.5 \times 9.37 \\ &= 140.155 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{140.66\}$$

We identify the ends of the whiskers: 107.83 and 132.64. We plot the boxplot.



1. **Solution**
The sample size, n, is 45. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 45 \rceil$	12	16.6
Q2	$\lceil 0.5 \times 45 \rceil$	23	18.08
Q3	$\lceil 0.75 \times 45 \rceil$	34	19.16

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 19.16 - 16.6 \\ &= 2.56 \end{aligned}$$

We determine the outlier boundaries.

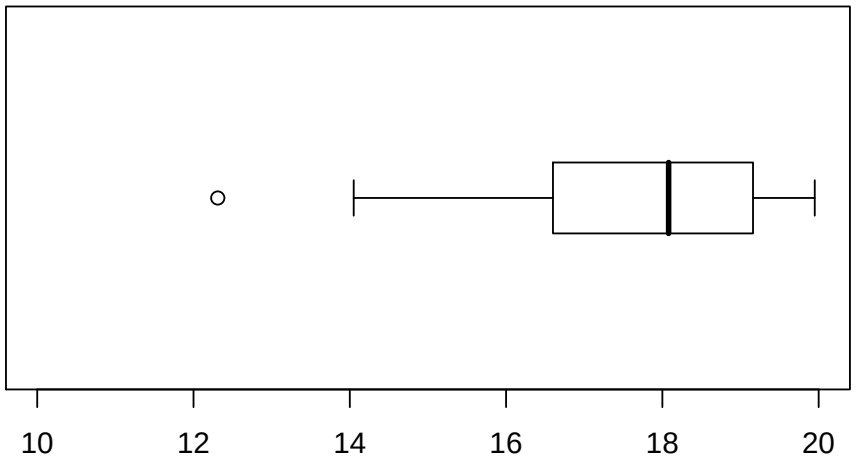
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 16.6 - 1.5 \times 2.56 \\ &= 12.76 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 19.16 + 1.5 \times 2.56 \\ &= 23 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{12.31\}$$

We identify the ends of the whiskers: 14.05 and 19.95. We plot the boxplot.



2. **Solution**
The sample size, n, is 42. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 42 \rceil$	11	40.17
Q2	$\lceil 0.5 \times 42 \rceil$	21	40.4
Q3	$\lceil 0.75 \times 42 \rceil$	32	40.95

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 40.95 - 40.17 \\ &= 0.78 \end{aligned}$$

We determine the outlier boundaries.

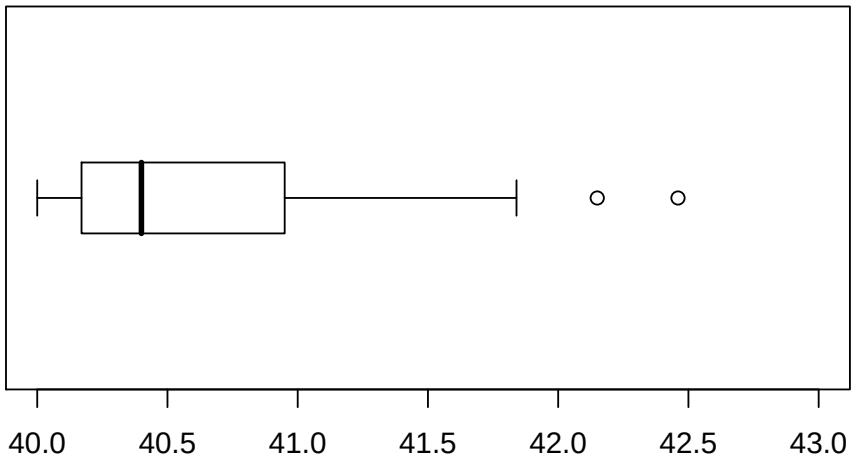
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 40.17 - 1.5 \times 0.78 \\ &= 39 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 40.95 + 1.5 \times 0.78 \\ &= 42.12 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{42.15, 42.46\}$$

We identify the ends of the whiskers: 40 and 41.84. We plot the boxplot.



1. **Solution**
The sample size, n, is 63. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 63 \rceil$	16	22
Q2	$\lceil 0.5 \times 63 \rceil$	32	24.21
Q3	$\lceil 0.75 \times 63 \rceil$	48	27.07

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 27.07 - 22 \\ &= 5.07 \end{aligned}$$

We determine the outlier boundaries.

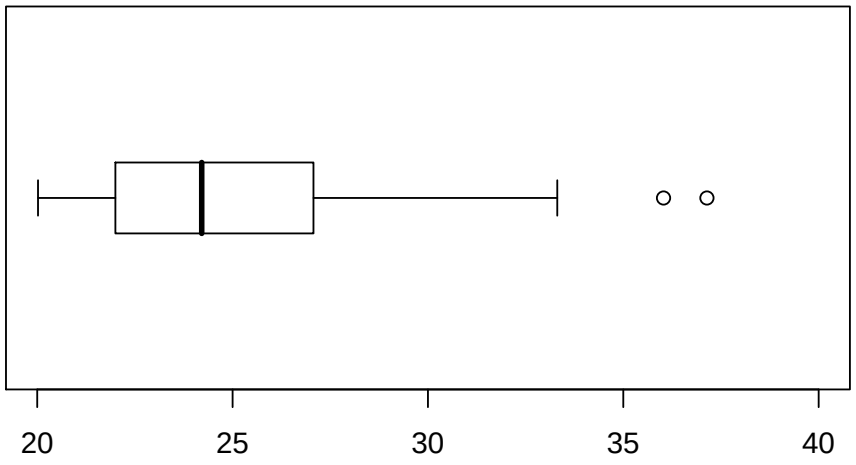
$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 22 - 1.5 \times 5.07 \\ &= 14.395 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 27.07 + 1.5 \times 5.07 \\ &= 34.675 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{36.03, 37.14\}$$

We identify the ends of the whiskers: 20.02 and 33.31. We plot the boxplot.



2. **Solution**
The sample size, n, is 72. We determine the indeces and values of Q1, Q2, and Q3.

Quartile	Formula for i	i	x
Q1	$\lceil 0.25 \times 72 \rceil$	18	21.98
Q2	$\lceil 0.5 \times 72 \rceil$	36	22.49
Q3	$\lceil 0.75 \times 72 \rceil$	54	22.69

We determine the IQR.

$$\begin{aligned} \text{IQR} &= \text{Q3} - \text{Q1} \\ &= 22.69 - 21.98 \\ &= 0.71 \end{aligned}$$

We determine the outlier boundaries.

$$\begin{aligned} \text{lower boundary} &= \text{Q1} - 1.5 \times \text{IQR} \\ &= 21.98 - 1.5 \times 0.71 \\ &= 20.915 \end{aligned}$$

$$\begin{aligned} \text{upper boundary} &= \text{Q3} + 1.5 \times \text{IQR} \\ &= 22.69 + 1.5 \times 0.71 \\ &= 23.755 \end{aligned}$$

We determine the outliers.

$$\text{outliers} = \{20.17\}$$

We identify the ends of the whiskers: 21.03 and 23. We plot the boxplot.