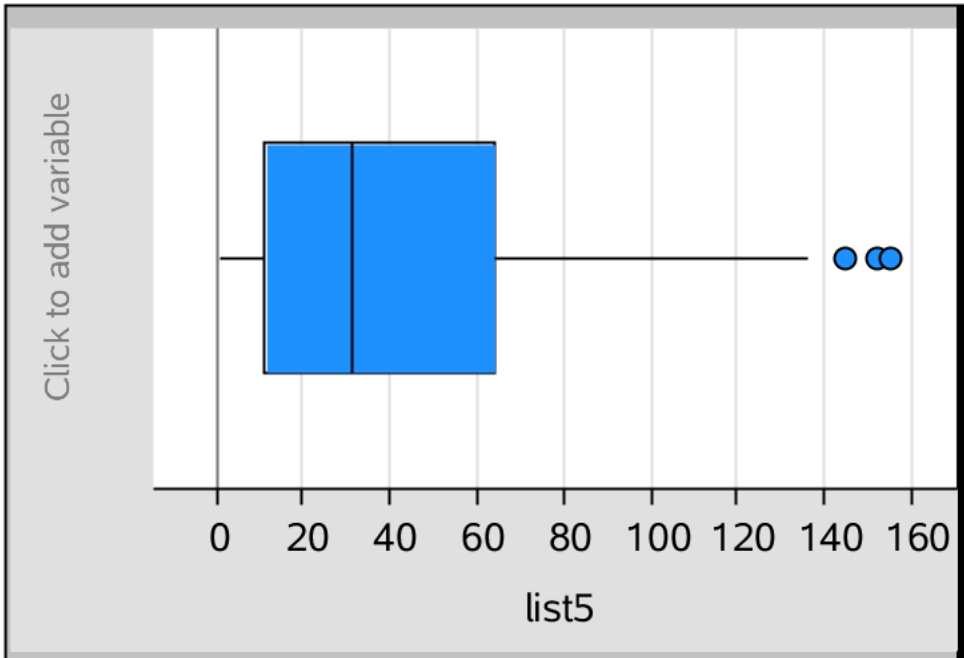
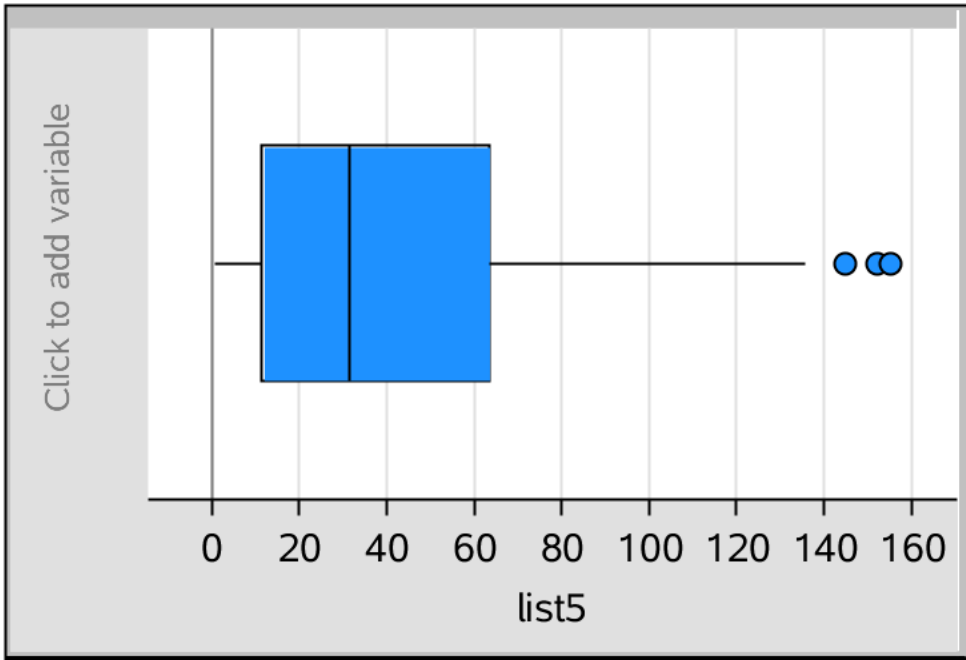


$$\text{population variance} = \frac{84274.4}{40.} \blacktriangleright 2106.86$$

$$\text{sample variance} = \frac{84274.4}{39.} \blacktriangleright 2160.88$$

	A list5	B	C	D
=			=OneVar('	
3	1	Σx	1868.	
4	1	Σx²	171510.	
5	1	sx := sn-...	46.4853	
6	1	σx := σn...	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q₁X	11.5	
10	2	MedianX...	31.5	
11	21	Q₃X	64.	
12	22	MaxX	155.	
13	23	SSX := Σ..	84274.4	

A3 =1

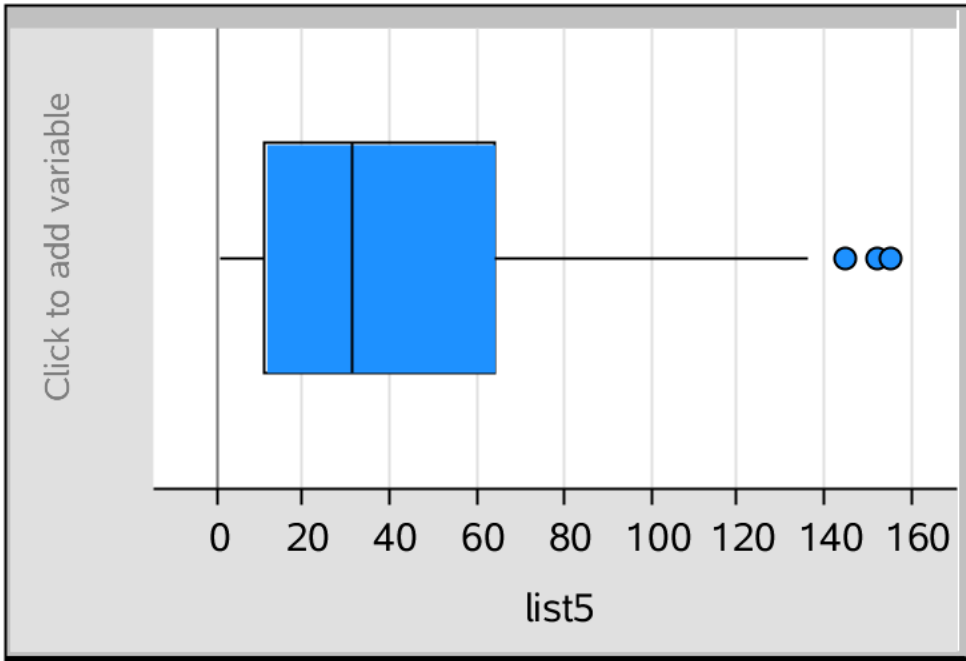


$$\text{population st dev} = \sqrt{\frac{84274.4}{40.}} \blacktriangleright 45.9005$$

$$\text{sample st dev} = \sqrt{\frac{84274.4}{39.}} \blacktriangleright 46.4853$$

	A list5	B	C	D
=			=OneVar(	
1	1	Title	One-Va...	
2	1	$\bar{x}$	46.7	
3	1	Σx	1868.	
4	1	Σx^2	171510.	
5	1	sx := $s_{n-...}$	46.4853	
6	1	σx := $\sigma_{n...}$	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q_1X	11.5	
10	2	MedianX...	31.5	
11	21	Q_3X	64.	

A4 =1



IQR =64−11.5 ▸ 52.5

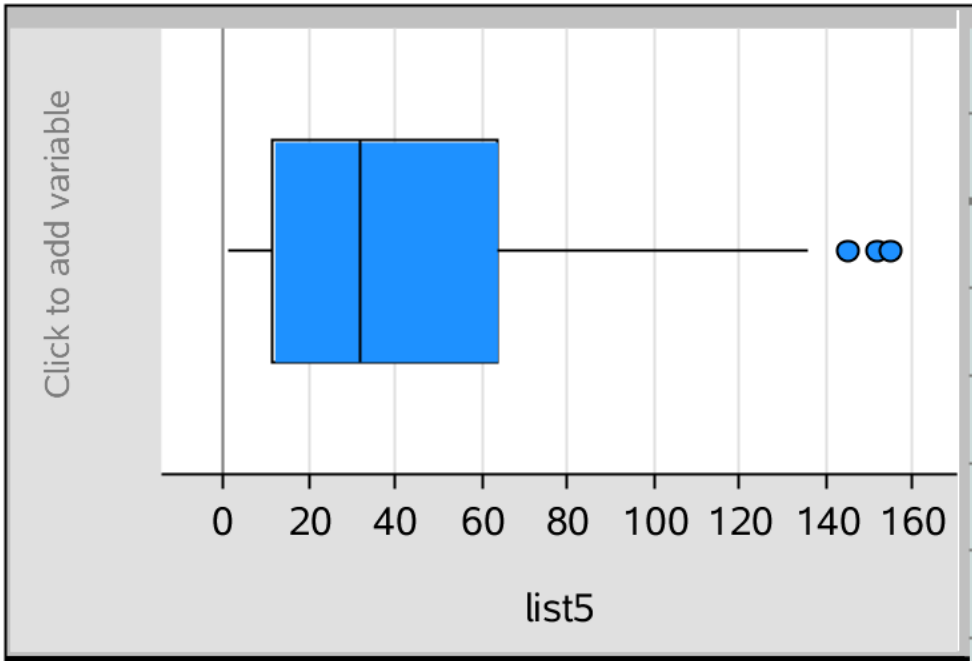
Q1 score 11.5

Q3 score 64

1.5· IQR =1.5·52.5 ▸ 78.75

	A list5	B	C	D
=			=OneVar(	
1	1	Title	One−Va...	
2	1	$\bar{x}$	46.7	
3	1	Σx	1868.	
4	1	Σx^2	171510.	
5	1	sx := $s_{n-...}$	46.4853	
6	1	σx := $\sigma_{n...}$	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q_1X	11.5	
10	2	MedianX...	31.5	
11	21	Q_3X	64.	

A1 =1



lower fence =11.5−78.75 = -67.25

upper fence 64+78.75 = 142.75

all scores that lie

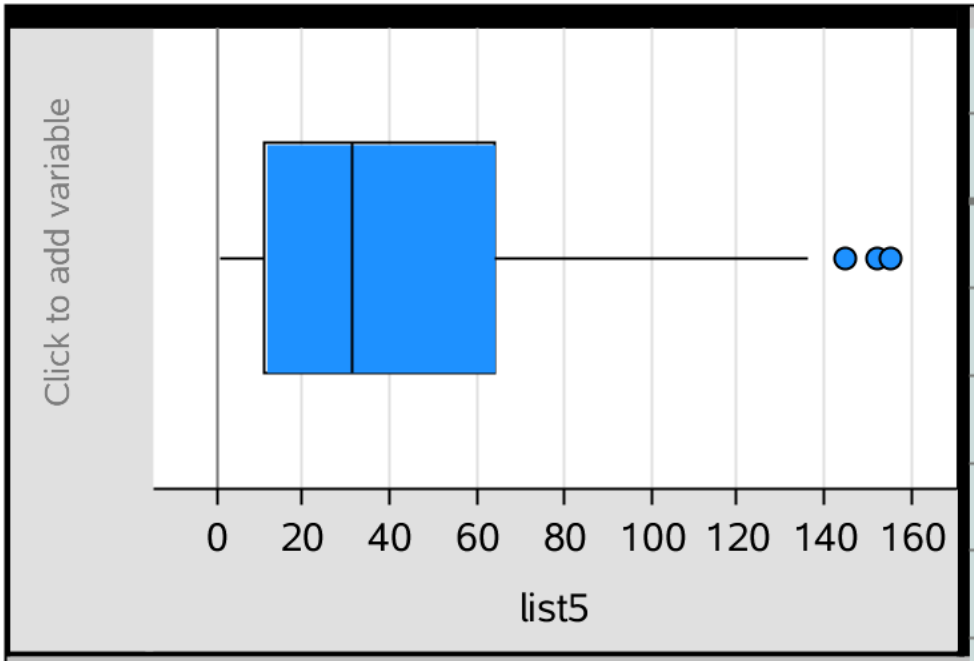
below x = −67.25

and above x =142.75 are outliers

list 5 outliers 145 152 155

	A list5	B	C	D
=			=OneVar(	
1	1	Title	One-Va...	
2	1	$\bar{x}$	46.7	
3	1	Σx	1868.	
4	1	Σx^2	171510.	
5	1	sx := $s_{n-...}$	46.4853	
6	1	σx := $\sigma_{n...}$	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q_1X	11.5	
10	2	MedianX...	31.5	
11	21	Q_3X	64.	

A1 =1



	A list5	B	C	D
=			=OneVar('	
1	1	Title	One-Va...	
2	1	$\bar{x}$	46.7	
3	1	Σx	1868.	
4	1	Σx^2	171510.	
5	1	sx := $s_{n-...}$	46.4853	
6	1	σx := $\sigma_{n...}$	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q_1X	11.5	
10	2	MedianX...	31.5	
11	21	Q_3X	64.	

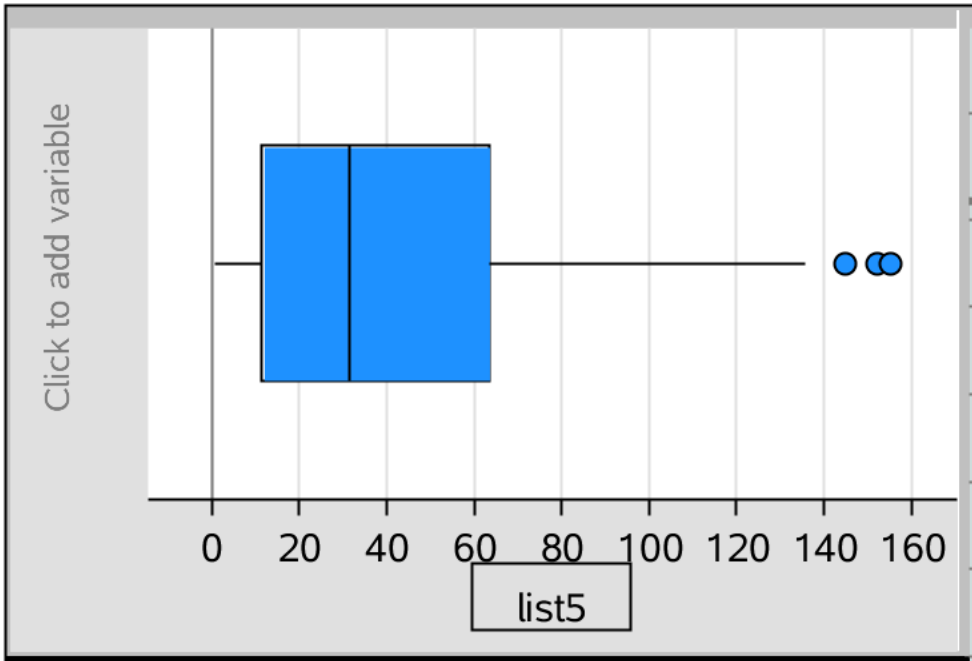
A1 =1

all scores that lie

below x = −67.25 and

above x =142.75 are outliers

list 5 outliers are 145, 152, and 155



sample standard deviation is 46.5

usual range

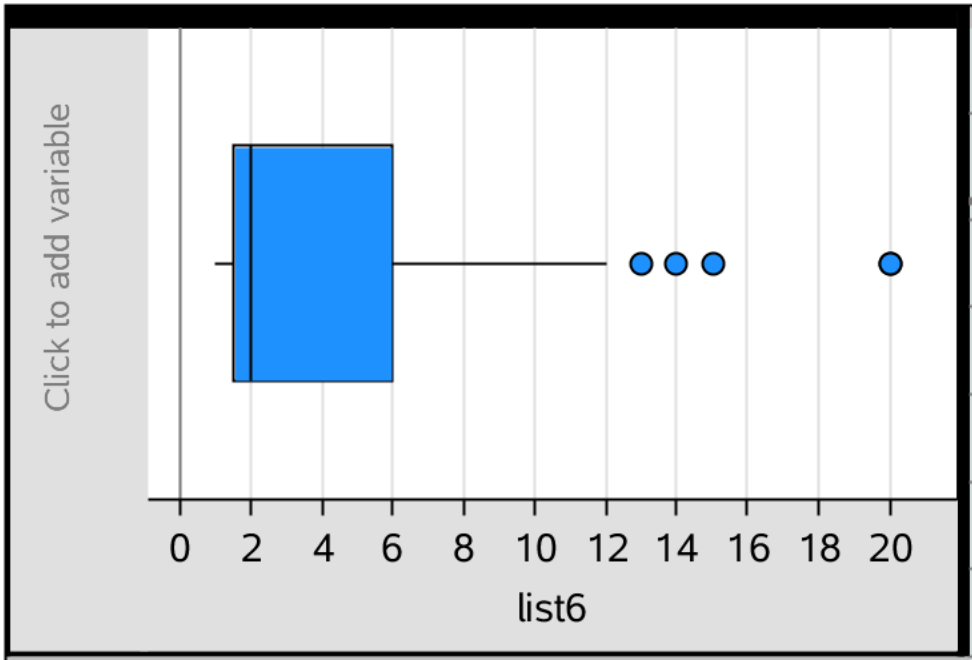
mean − 2 st dev to mean + 2 st dev

$46.7-2\cdot 46.5$ to $46.7+2\cdot 46.5$

-46.3 to 139.7

	A list5	B	C	D
=			=OneVar('	
2	1	$\bar{x}$	46.7	
3	1	Σx	1868.	
4	1	Σx^2	171510.	
5	1	sx := $s_{n-...}$	46.4853	
6	1	σx := $\sigma_{n...}$	45.9005	
7	1	n	40.	
8	2	MinX	1.	
9	2	Q_1X	11.5	
10	2	MedianX...	31.5	
11	21	Q_3X	64.	
12	22	MaxX	155.	

C12 =155.

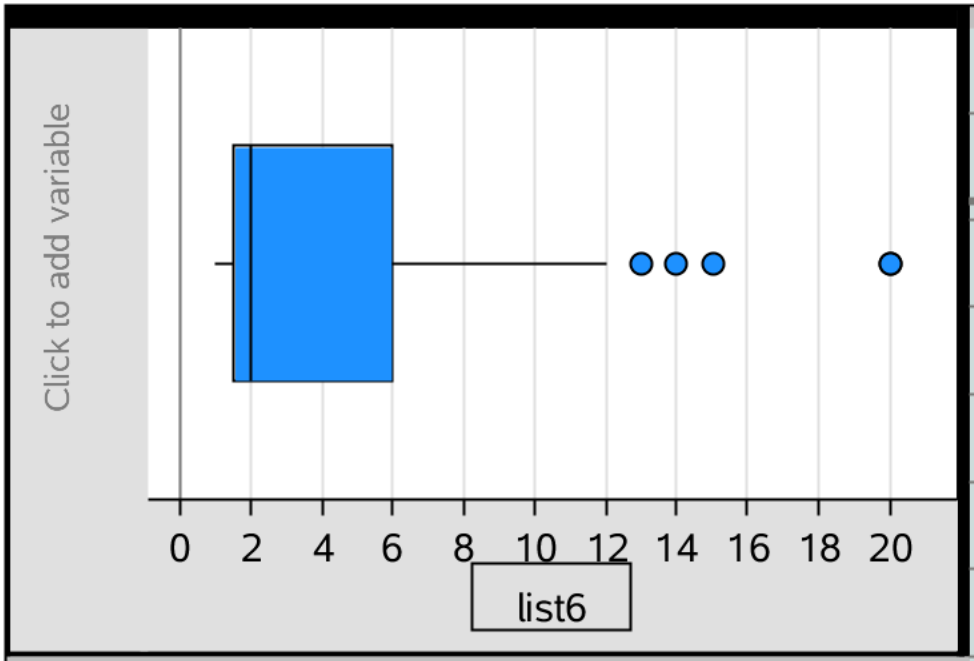


population variance $= \frac{1140.78}{40.} \blacktriangleright 28.5195$

sample variance $= \frac{1140.78}{39.} \blacktriangleright 29.2508$

	A list6	B	C	D
=			=OneVar('	
3	1	Σx	203.	
4	1	Σx²	2171.	
5	1	sx := sn-...	5.40839	
6	1	σx := σn...	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q₁X	1.5	
10	1	MedianX...	2.	
11	2	Q₃X	6.	
12	2	MaxX	20.	
13	2	SSX := Σ..	1140.78	

A13 =2

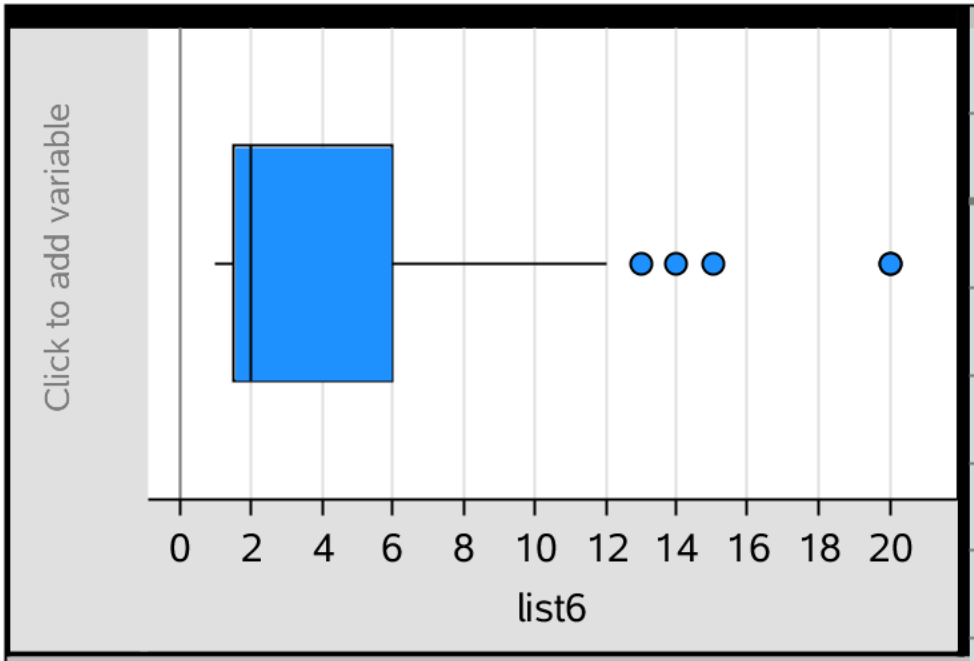


	A list6	B	C	D
=			=OneVar('	
3	1	Σx	203.	
4	1	Σx²	2171.	
5	1	sx := sn-...	5.40839	
6	1	σx := σn...	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q₁X	1.5	
10	1	MedianX...	2.	
11	2	Q₃X	6.	
12	2	MaxX	20.	
13	2	SSX := Σ..	1140.78	

C13 =1140.775

population st dev = $\sqrt{\frac{1140.78}{40.}}$ ▸ 5.34037

sample st dev = $\sqrt{\frac{1140.78}{39.}}$ ▸ 5.4084



IQR =6−1.5 ▸ 4.5

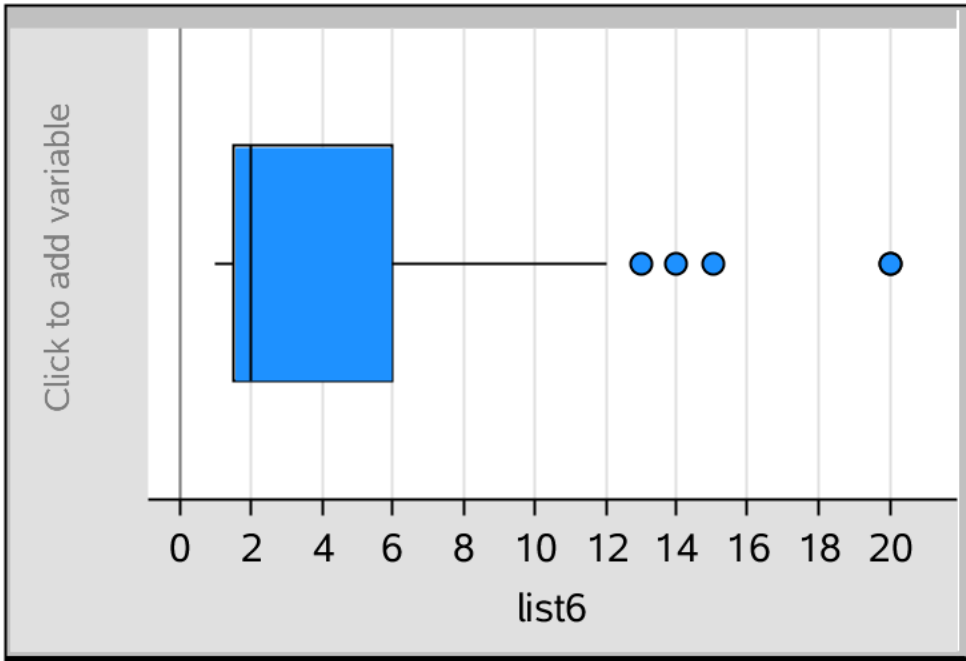
Q1 score 1.5

Q3 score 6

1.5· IQR =1.5·4.5 ▸ 6.75

	A list6	B	C	D
=			=OneVar(	
1	1	Title	One−Va...	
2	1	$\bar{x}$	5.075	
3	1	Σx	203.	
4	1	Σx^2	2171.	
5	1	sx := $s_{n-...}$	5.40839	
6	1	σx := $\sigma_{n...}$	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q_1X	1.5	
10	1	MedianX...	2.	
11	2	Q_3X	6.	

C1 ="One−Variable Statistics "



lower fence =1.5−6.75 = -5.25

upper fence 6+6.75 = 12.75

all scores that lie

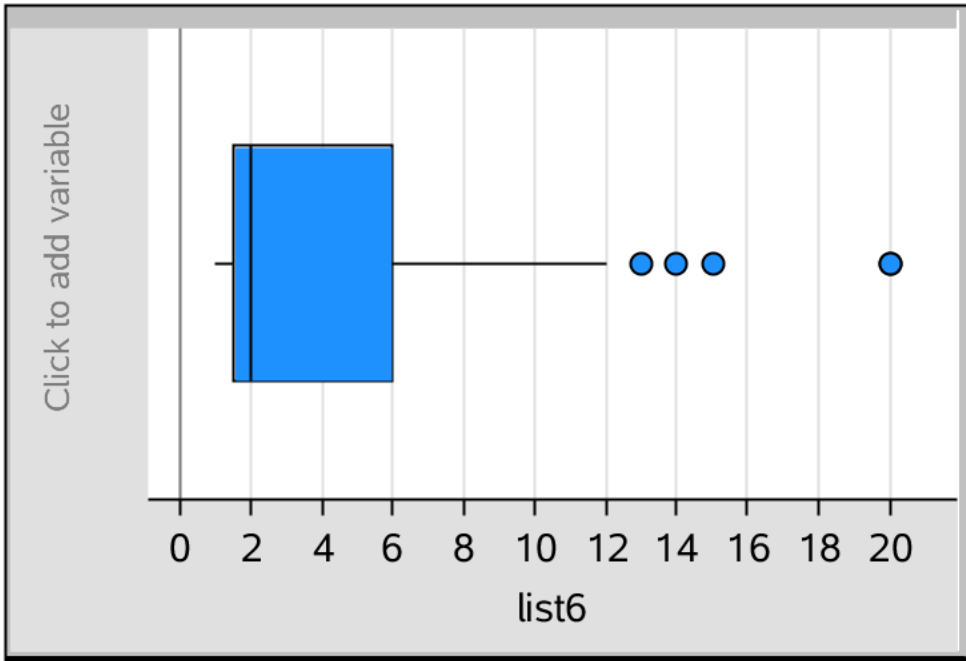
below x = −5.25

and above x =12.75 are outliers

list 6 outliers 13 14 15 20

	A list6	B	C	D
=			=OneVar('	
1	1	Title	One−Va...	
2	1	$\bar{x}$	5.075	
3	1	Σx	203.	
4	1	Σx^2	2171.	
5	1	sx := $s_{n-...}$	5.40839	
6	1	σx := $\sigma_{n...}$	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q_1X	1.5	
10	1	MedianX...	2.	
11	2	Q_3X	6.	

C1 ="One−Variable Statistics "



all scores that lie

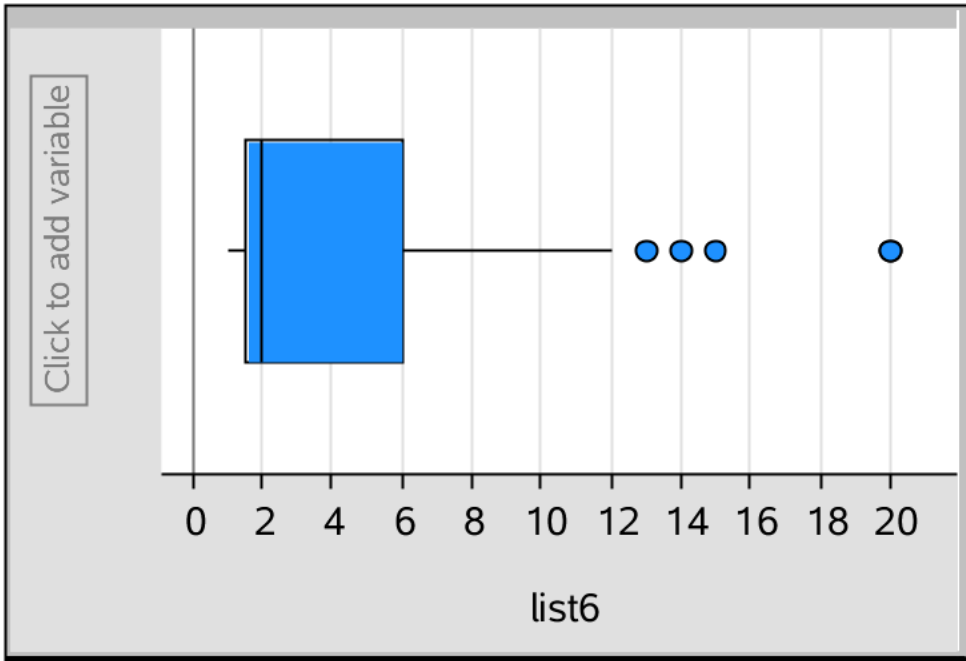
below x = −5.75 and

above x =12.75 are outliers

list 6 outliers are 13 14 15 20

	A list6	B	C	D
=			=OneVar('	
1	1	Title	One−Va...	
2	1	$\bar{x}$	5.075	
3	1	Σx	203.	
4	1	Σx^2	2171.	
5	1	sx := $s_{n-...}$	5.40839	
6	1	σx := $\sigma_{n...}$	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q_1X	1.5	
10	1	MedianX...	2.	
11	2	Q_3X	6.	

C1 ="One−Variable Statistics "



sample standard deviation is 5.4

usual range

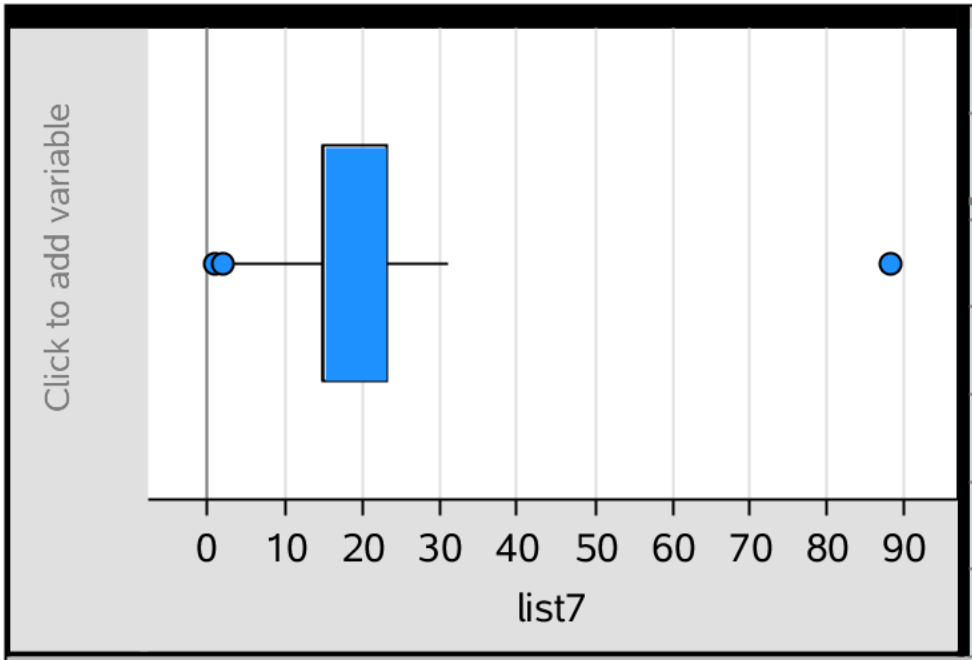
mean − 2 st dev to mean + 2 st dev

$5.1-2\cdot 5.4$ to $5.1+2\cdot 5.4$

-5.7 to 15.9

	A list6	B	C	D
=			=OneVar(	
1	1	Title	One-Va...	
2	1	$\bar{x}$	5.075	
3	1	Σx	203.	
4	1	Σx^2	2171.	
5	1	sx := $s_{n-...}$	5.40839	
6	1	σx := $\sigma_{n...}$	5.34035	
7	1	n	40.	
8	1	MinX	1.	
9	1	Q_1X	1.5	
10	1	MedianX...	2.	
11	2	Q_3X	6.	

A1 =1

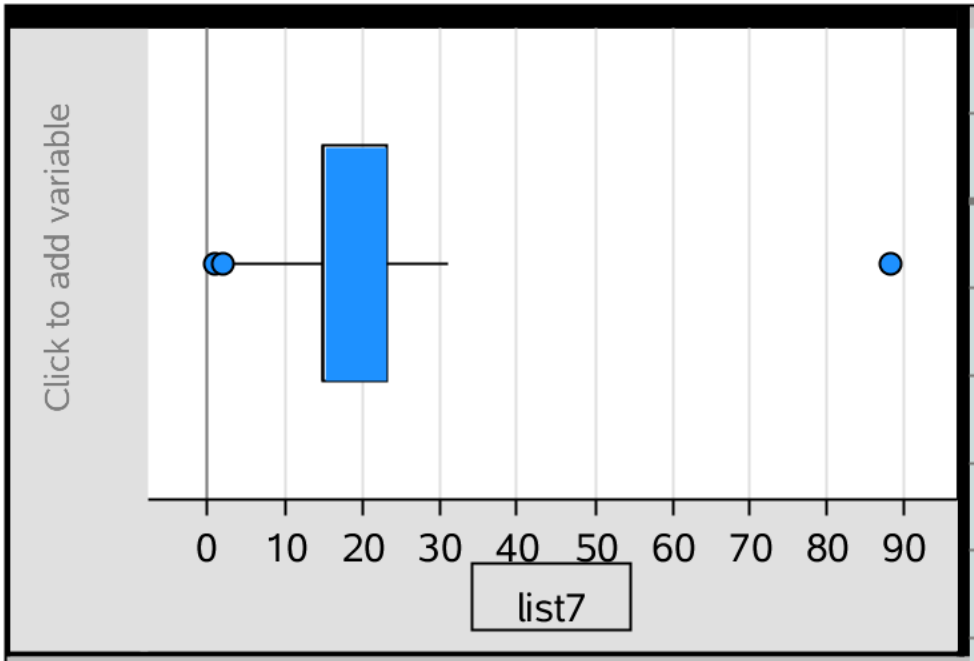


	A list7	B	C	D
=			=OneVar('	
3	3	Σx	736.	
4	4	Σx²	21272.	
5	5	sx := sn-...	14.0782	
6	6	σx := σn...	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q₁X	15.	
10	15	MedianX...	15.	
11	15	Q₃X	23.	
12	15	MaxX	88.	
13	15	SSX := Σ..	7729.6	

C13 =7729.6

$$\text{population variance} = \frac{7729.6}{40.} \blacktriangleright 193.24$$

$$\text{sample variance} = \frac{7729.6}{39.} \blacktriangleright 198.195$$

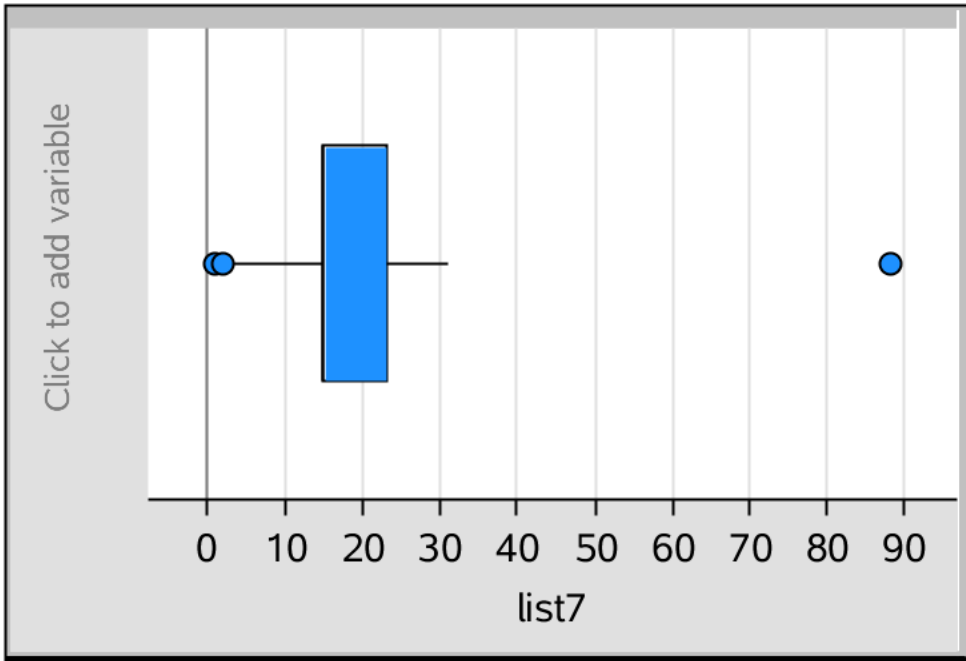


population st dev = $\sqrt{\frac{7729.6}{40.}}$ ▸ 13.9011

sample st dev = $\sqrt{\frac{7729.6}{39.}}$ ▸ 14.0782

	A list7	B	C	D
=			=OneVar(	
1	1	Title	One−Va...	
2	2	$\bar{x}$	18.4	
3	3	Σx	736.	
4	4	Σx^2	21272.	
5	5	sx := $s_{n-...}$	14.0782	
6	6	σx := $\sigma_{n...}$	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q_1X	15.	
10	15	MedianX...	15.	
11	15	Q_3X	23.	

C1 ="One−Variable Statistics "



IQR =23−15 ▸ 8

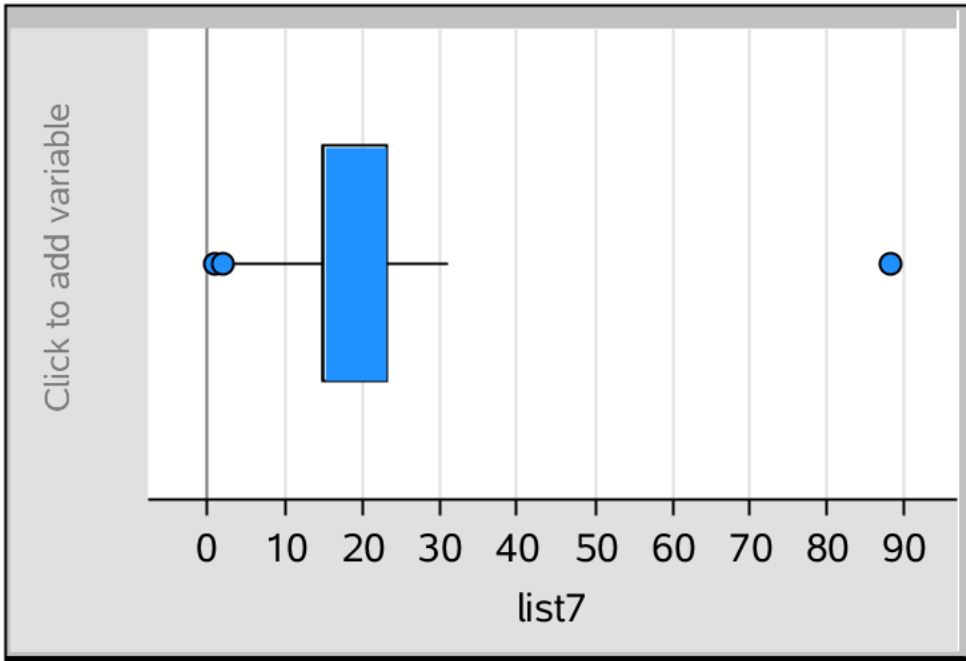
Q1 score 15

Q3 score 23

1.5· IQR =1.5·8 ▸ 12.

	A list7	B	C	D
=			=OneVar('	
1	1	Title	One−Va...	
2	2	$\bar{x}$	18.4	
3	3	Σx	736.	
4	4	Σx^2	21272.	
5	5	sx := $s_{n-...}$	14.0782	
6	6	σx := $\sigma_{n...}$	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q_1X	15.	
10	15	MedianX...	15.	
11	15	Q_3X	23.	

C1 ="One−Variable Statistics "



lower fence =15−12 = 3

upper fence 23+12 = 35

all scores that lie

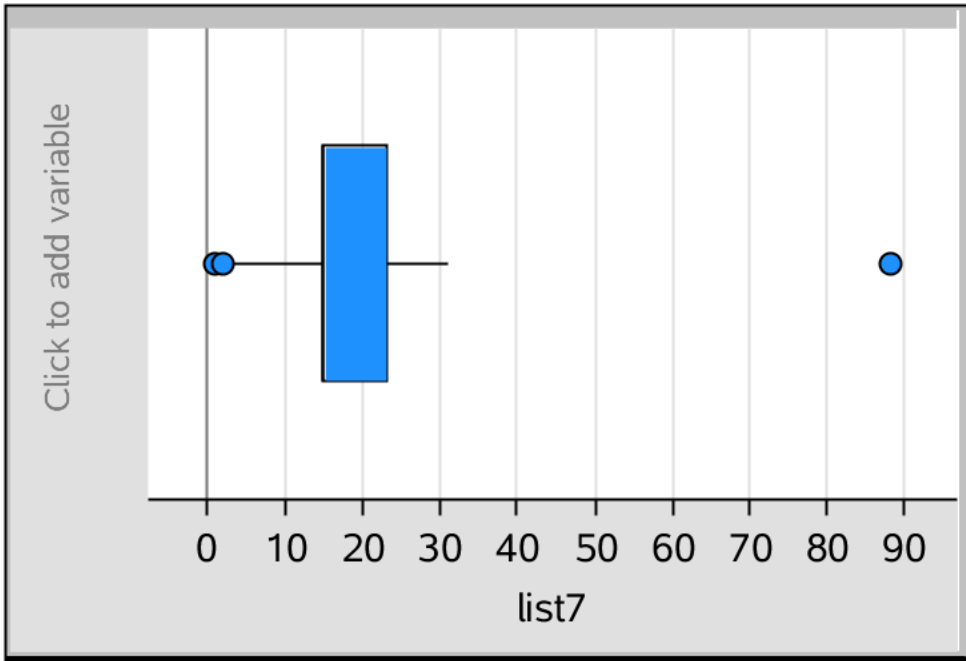
below x = 3

and above x =35 are outliers

list 7 outliers 1 2 88

	A list7	B	C	D
=			=OneVar('	
1	1	Title	One−Va...	
2	2	$\bar{x}$	18.4	
3	3	Σx	736.	
4	4	Σx^2	21272.	
5	5	sx := $s_{n-...}$	14.0782	
6	6	σx := $\sigma_{n...}$	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q_1X	15.	
10	15	MedianX...	15.	
11	15	Q_3X	23.	

C1 ="One−Variable Statistics "



all scores that lie

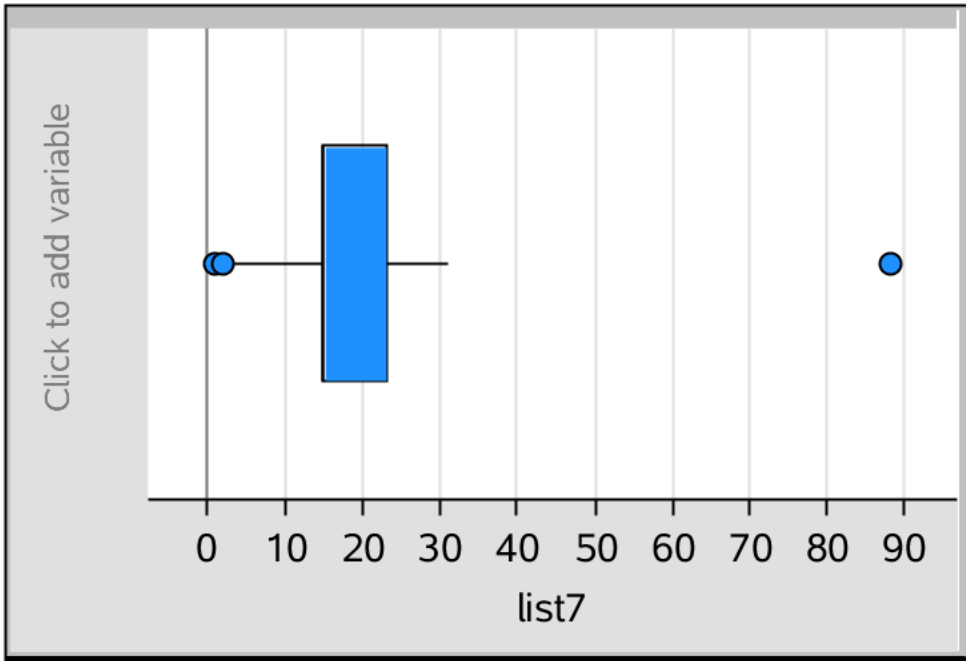
below x = 3 and

above x =35 are outliers

list 7 outliers are 1 2 88

	A list7	B	C	D
=			=OneVar('	
1	1	Title	One-Va...	
2	2	$\bar{x}$	18.4	
3	3	Σx	736.	
4	4	Σx^2	21272.	
5	5	sx := $s_{n-...}$	14.0782	
6	6	σx := $\sigma_{n...}$	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q_1X	15.	
10	15	MedianX...	15.	
11	15	Q_3X	23.	

A2 =2



sample standard deviation is 14.1

usual range

mean − 2 st dev to mean + 2 st dev

$18.4-2\cdot 14.1$ to $18.4+2\cdot 14.1$

-9.8 to 46.6

	A list7	B	C	D
=			=OneVar('	
1	1	Title	One−Va...	
2	2	$\bar{x}$	18.4	
3	3	Σx	736.	
4	4	Σx^2	21272.	
5	5	sx := $s_{n-...}$	14.0782	
6	6	σx := $\sigma_{n...}$	13.9011	
7	7	n	40.	
8	15	MinX	1.	
9	15	Q_1X	15.	
10	15	MedianX...	15.	
11	15	Q_3X	23.	

C1 ="One−Variable Statistics "

Empirical Rule

List 5

68% of the data should lie between

mean − 1 st dev to mean + 1 st dev

$46.7-1\cdot 46.5$ to $46.7+1\cdot 46.5$

$46.7-2\cdot 46.5 \blacktriangleright -46.3$ to

$46.7+2\cdot 46.5 \blacktriangleright 139.7$

Empirical Rule

list 5

95% of the data should lie between

usual range

mean − 2 st dev to mean + 2 st dev

$46.7-2\cdot 46.5$ to $46.7+2\cdot 46.5$

-46.3 to 139.7

Empirical Rule

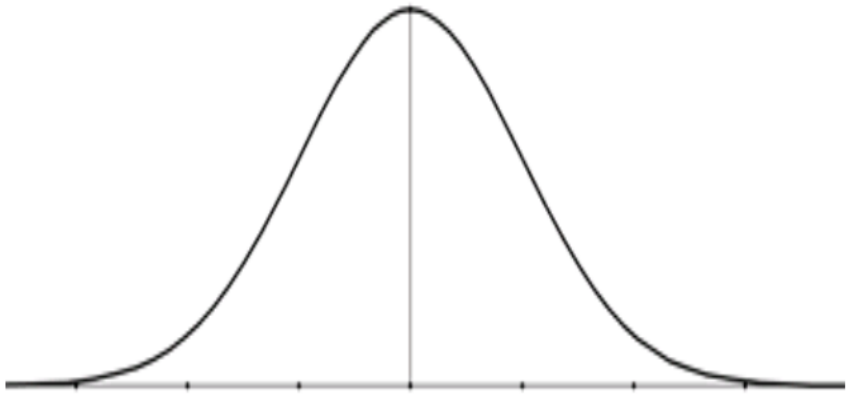
List 5

99.7% of the data should lie between

mean − 3 st dev to mean + 3 st dev

$46.7-3\cdot 46.5$ to $46.7+3\cdot 46.5$

-92.8 to 186.2



Empirical Rule

List 6

68% of the data should lie between

mean − 1 st dev to mean + 1 st dev

$5.1-1\cdot 5.4$ to $5.1+2\cdot 5.4$

-0.3 to 15.9

Empirical Rule

list 6

95% of the data should lie between

usual range

mean − 2 st dev to mean + 2 st dev

$5.1-2\cdot 5.4$ to $5.1+2\cdot 5.4$

-5.7 to 15.9

Empirical Rule

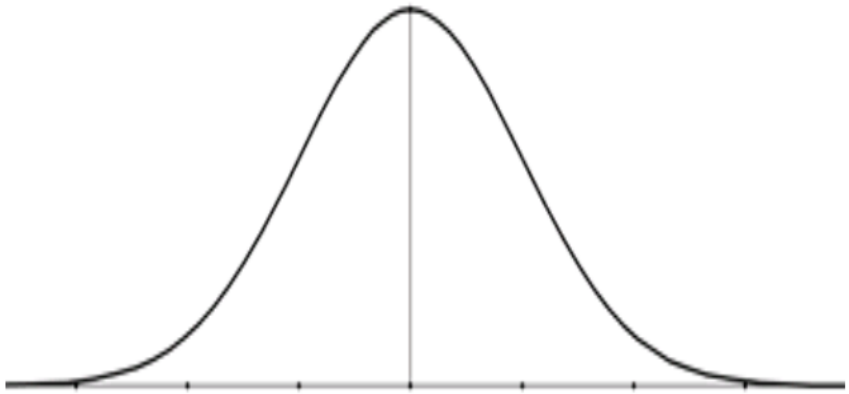
List 6

99.7% of the data should lie between

mean − 3 st dev to mean + 3 st dev

$5.1-1\cdot 5.4$ to $5.1+3\cdot 5.4$

-11.1 to 21.3



Empirical Rule

List 7

68% of the data should lie between

mean − 1 st dev to mean + 1 st dev

$18.4-1\cdot 14.1$ to $18.4+1\cdot 14.1$

4.3 to 32.5

Empirical Rule

list 7

95% of the data should lie between

usual range

mean − 2 st dev to mean + 2 st dev

$18.4-2\cdot 14.1$ to $18.4+2\cdot 14.1$

-9.8 to 46.6

Empirical Rule

List 7

99.7% of the data should lie between

mean − 3 st dev to mean + 3 st dev

$18.4-3\cdot 14.1$ to $18.4+2\cdot 14.1$

-23.9 to 60.7