

Box-and-Whisker Plots

Unit 8: Statistics

Draw a box-and-whisker plot for each data set.

1.

Monthly Revenue

\$69,200	\$53,120	\$47,320	\$85,610	\$50,470	\$52,780
\$77,270	\$50,060	\$80,770	\$59,110	\$72,470	\$54,250
\$58,740	\$84,060	\$66,820	\$55,690	\$68,620	

min
47320

Q1
52,950

Q2
59110

Q3
74870

max
85610

$$IQR = 21920$$

2.

Car Masses (kg)

1,465	1,375	1,725	1,040	1,395	1,745
1,380	1,355	1,645	1,395	1,285	965
1,630	1,885	1,420	1,440	1,365	1,745
1,600	1,715	1,745	1,560		

min
965

Q1
1375

Q2
1452.5

Q3
1715

max
1885

$$IQR = 340$$

3.

Per Capita Income

Country	US Dollars	Country	US Dollars	Country	US Dollars
Turkey	18,975	Gabon	19,260	Iceland	39,996
Niger	913	Aruba	36,016	Iran	15,586
South Sudan	2,330	United Kingdom	36,197	China	11,904
Kenya	2,265	Swaziland	6,683	Grenada	11,498
Mauritania	3,042	Djibouti	2,998	Cambodia	3,042
		Afghanistan	1,990		

min
913

Q1
2664

Q2
9090.5

Q3
19117.5

max
39996

$$IQR = 16453.5$$

Draw a box-and-whisker plot for each data set.

4.

Age at Inauguration

President	Age	President	Age	President	Age
Herbert Hoover	54	Rutherford B Hayes	54	John Adams	61
Millard Fillmore	50	Richard Nixon	56	John Tyler	51
Warren G Harding	55	Ronald Reagan	69	Jimmy Carter	52
John F Kennedy	43	Ulysses S Grant	46	Grover Cleveland	47
Barack Obama	47	Dwight D Eisenhower	62	George H W Bush	64
John Quincy Adams	57	James Madison	57	Andrew Jackson	61
Lyndon B Johnson	55	Zachary Taylor	64	Martin Van Buren	54
		James Buchanan	65		

min
43

Q1
51

Q2
55

Q3
61

max
69

$IQR = 10$

5.

Injuries Due to Distracted Driving per Month

9,894	5,720	7,886	9,871	10,059	9,772
11,110	9,673	10,395	5,812	7,776	6,202
5,602	5,566	10,136	9,747	8,813	5,354
7,182	7,860	8,027	9,658	7,734	

min
5354

Q1
6262

Q2
8027

Q3
9871

max
11110

$IQR = 3669$

6.

Mountain Heights

Name	Meters	Name	Meters	Name	Meters
Putha Hiunchuli	7,246	Kangchenjunga	8,586	Annapurana I	8,091
Saser Kangri III	7,495	Jongsong Peak	7,462	Shishapangma	8,027
Saltoro Kangri	7,742	Kongur Tagh	7,649	Nanga Parbat	8,126
Teram Kangri I	7,462	Baltistan Peak	7,282	Batura Sar	7,795
Skyang Kangri	7,545	Dhaulagiri I	8,167	Jengish Shokusu	7,439
Chomo Lonzo	7,804	Langtang Lirung	7,227	Saraghrar	7,349
Gasherbrum I	8,080	Ultrar	7,388	Gasherbrum IV	7,932
Lupghar Sar	7,200	Mamostong Kangri	7,516		

min
7200

Q1
7388

Q2
7545

Q3
8027

max
8586

$IQR = 639$

① List data least to greatest.

47320, 50060, 50470, 52780, 53120, 54250, 55690, 58740,
59110, 66820, 68620, 69200, 72470, 77270, 80770, 84060, 85610

$$\text{Max} = 85610$$

$$\text{min} = 47320$$

$$\begin{aligned}\text{Range} &= 85610 - 47320 \\ &= 38290\end{aligned}$$

There's 17 numbers.

Median number will be the 9th number.

Lower half of data (First 8 numbers)

47320, 50060, 50470, 52780, 53120, 54250, 55690, 58740

↑
Lower Quartile (Q1)

$$\frac{52780 + 53120}{2} = \frac{105900}{2} = 52,950$$

Median: 59110 (Q2)

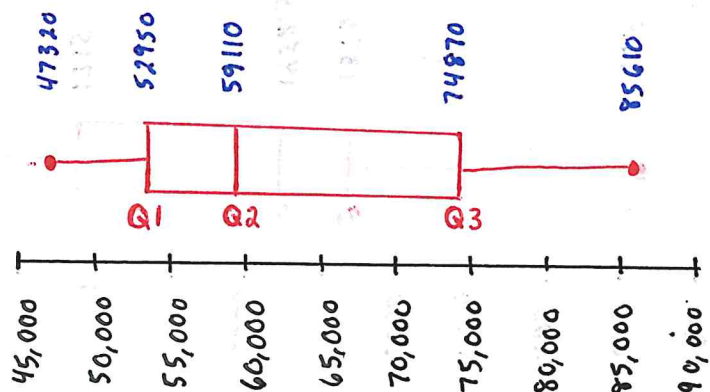
Upper half of data (Last 8 numbers)

66820, 68620, 69200, 72470, 77270, 80770, 84060, 85610

↑
Upper Quartile (Q3)

$$\frac{72470 + 77270}{2} = \frac{149740}{2} = 74870$$

$$\text{Interquartile Range} = Q3 - Q1 = 74870 - 52950 = \boxed{21920}$$



② List data least to greatest.

965, 1040, 1285, 1355, 1365, 1375, 1380, 1395, 1395, 1420, 1440,
1465, 1560, 1600, 1630, 1645, 1715, 1725, 1745, 1745, 1745, 1885

$$\text{max} = 1885$$

$$\text{Range} = 1885 - 965$$

$$\text{min} = 965$$

$$= 920$$

Number line can go from 900 to 1900 going by 100's.

There's 22 numbers.

Lower half of data (First 11 numbers)

965, 1040, 1285, 1355, 1365, 1375, 1380, 1395, 1395, 1420, 1440

↑
Lower Quartile (Q1)

Median (Q2)

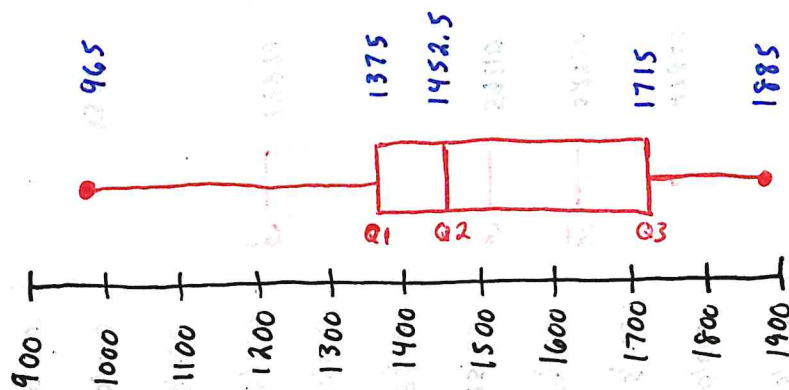
$$\frac{1440 + 1465}{2} = \frac{2905}{2} = 1452.5$$

Upper half of data (Last 11 numbers)

1465, 1560, 1600, 1630, 1645, 1715, 1725, 1745, 1745, 1745, 1885

↑
Upper Quartile (Q3)

$$\text{Interquartile Range} = Q3 - Q1 = 1715 - 1375 = \boxed{340}$$



③ List data least to greatest.

913, 1990, 2265, 2330, 2998, 3042, 3042, 6683, 11498,
11904, 15586, 18975, 19260, 36016, 36197, 39996

$$\text{Max} = 39996$$

$$\text{Range} = 39996 - 913$$

$$\text{min} = 913$$

$$= 39083$$

Range will go to 40,000. Start at 0 and go by 5000.

There's 16 numbers.

Lower half of data (First 8 numbers)

913, 1990, 2265, 2330, 2998, 3042, 3042, 6683

↑
Lower Quartile (Q1)

$$\frac{2330 + 2998}{2} = \frac{5328}{2} = 2664$$

Median (Q2)

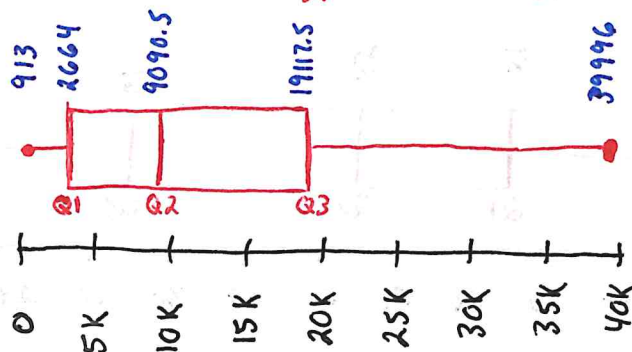
$$\frac{6683 + 11498}{2} = \frac{18181}{2} = 9090.5$$

Upper half of data (Last 8 numbers)

11498, 11904, 15586, 18975, 19260, 36016, 36197, 39996

↑
Upper Quartile (Q3)

$$\frac{18975 + 19260}{2} = \frac{38235}{2} = 19117.5$$



$$\text{Interquartile Range} = Q3 - Q1 = 19117.5 - 2664 = \boxed{16453.5}$$

④ List data least to greatest

43, 46, 47, 47, 50, 51, 52, 54, 54, 54, 55, 55, 56, 57, 57,
61, 61, 62, 64, 64, 65, 69

$$\text{Max} = 69$$

$$\text{Range} = 69 - 43$$

$$\text{min} = 43$$

$$= 26$$

Range starts at 40 and goes to 70 by 2's

There's 22 numbers.

Lower half of data (First 11 numbers)

43, 46, 47, 47, 50, 51, 52, 54, 54, 54, 55

↑
Lower Quartile (Q1)

Median (Q2)

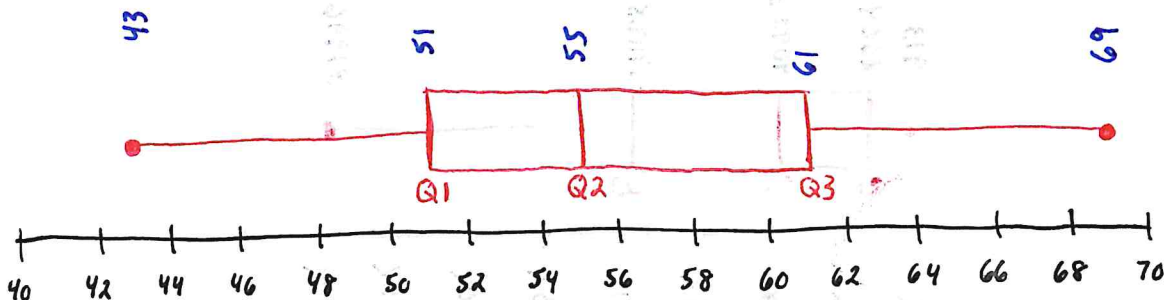
$$\frac{55 + 55}{2} = \frac{110}{2} = 55$$

Upper half of data (Last 11 numbers)

55, 56, 57, 57, 61, 61, 62, 64, 64, 65, 69

↑
Upper Quartile (Q3)

$$\text{Interquartile Range} = Q3 - Q1 = 61 - 51 = \boxed{10}$$



⑥ List data least to greatest.

7200, 7227, 7246, 7282, 7349, 7388, 7439, 7462, 7462,
7495, 7516, 7545, 7649, 7742, 7795, 7804, 7932, 8027,
8080, 8091, 8126, 8167, 8586

$$\text{Max} = 8586$$

$$\text{min} = 7200$$

$$\text{Range} = 8586 - 7200$$

$$= 1386$$

Range can start at 7200 and go to 8600 by 100's.

There's 23 numbers.

Lower half of data (First 11 numbers)

7200, 7227, 7246, 7282, 7349, 7388, 7439, 7462, 7462, 7495, 7516

↑
Lower Quartile (Q1)

Median (Q2)

7545

Upper half of data (Last 11 numbers)

7649, 7742, 7795, 7804, 7932, 8027, 8080, 8091, 8126, 8167, 8586

↑
Upper Quartile (Q3)

$$\text{Interquartile Range} = Q3 - Q1 = 8027 - 7388 = \boxed{639}$$

