Box-and-Whisker Plots – Day 5

Unit 8: Statistics

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

1.

Injuries Due to Distracted Driving per Month

6,589	8,560	6,800	9,182	10,028	8,034
5,000	12,080	7,584	11,518	10,203	8,061
9,315	14,356	6,639	9,725	7,553	

min 5000 Q1 7176.5 Q2 8560 Q3 10115.5 max 14356

IQR = 2939

2.

Annual Precipitation (Inches)

42	15.2	13.8	54	41	66.2
12.4	65.2	31.4	34.4	35.6	66.8
69.2	55.4	21.2	63.4	68.4	54.4
60.4	42	66	54.2	15.2	

min 12.4 Q1 31.4 Q2 54 Q3 65.2 max 69.2

IQR = 33.8

3.

Large Cities

City	Population	City	Population	City	Population
Tokyo	9,071,577	Mexico City	8,874,724	Durban	3,442,361
Xi'an	4,467,837	Faisalabad	3,547,446	Tianjin	9,341,844
Kinshasa	9,735,000	Lima	8,693,387	Shenzhen	10,467,400
Dar es Salaam	4,364,541	Xiamen	3,531,347	Foshan	6,151,622
Moscow	12,111,194	Changsha	3,093,980	Ankara	5,045,083
		Santiago	5,743,719		

min 3,093,980 Q1 3,955,933.5 Q2 5,947,670.5 Q3 9,206,710.5 max 12,111,194

IQR = 5,250,717

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

4.

Campers at National Parks

Park	Tent Campers	Park	Tent Campers	Park	Tent Campers
Catoctin Mountain Park	4,109	El Morro	1,378	Yellowstone	84,334
Wind Cave	5,595	Arches	26,352	Badlands	8,861
Denali	20,572	Cape Hatteras	40,947	Ozark	57,522
Sleeping Bear Dunes	48,477	Dinosaur	9,426	Bryce Canyon	35,978
Blue Ridge Parkway	39,816	Katmai	2,761	Lava Beds	8,463

min 1378 Q1 5595 Q2 20,572 Q3 40,947 max 84,334

IQR = 35,352

5.

Test Scores

53	43	44	59	44	57
47	46	43	44	39	51
47	50	40	50	48	58
47	44	45	47		

min 39 Q1 44 Q2 47 Q3 50 max 59

IQR = 6

6.

Life Expectancy

State	Years	State	Years	State	Years
Utah	82.2	New Mexico	77.7	New Hampshire	80.1
Washington	80.3	California	80.9	Vermont	80.4
New Jersey	82.4	Illinois	81.5	Texas	80.3
Tennessee	77.9	Mississippi	74.2	Wisconsin	79.8
Alaska	74.9	Montana	74.1	Idaho	81.4
South Carolina	78.3	District of Columbia	77.9	Maryland	81
Delaware	77	Louisiana	78.2	Arizona	79.3

min 74.1 Q1 77.8 Q2 79.8 Q3 80.95 max 82.4

IQR = 3.15

① 17 total numbers.

Lower half of data (8 numbers)

5000, 6589, 6639, 6800, 7553, 7584, 8034, 8061

↑ Lower Quartile (Q1)

$\frac{6800 + 7553}{2} = \frac{14353}{2} = 7176.5$

Median (Q2)

8560

Upper half of data (8 numbers)

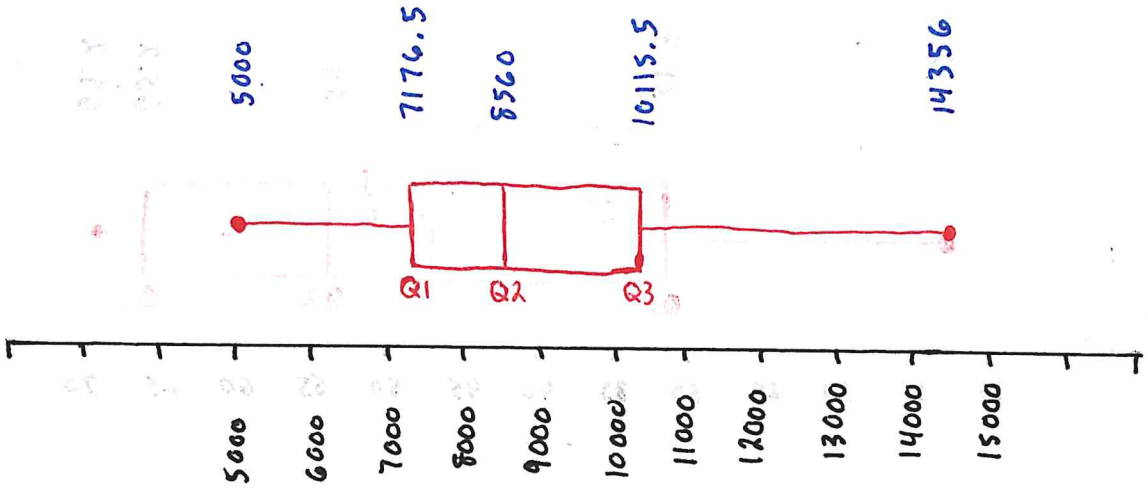
9182, 9315, 9725, 10028, 10203, 11518, 12080, 14356

↑ Upper Quartile (Q3)

$\frac{10028 + 10203}{2} = \frac{20231}{2} = 10115.5$

$IQR = Q3 - Q1 = 10115.5 - 7176.5 = \boxed{2939}$

$Range = Max - Min = 14356 - 5000 = \boxed{9356}$



② 23 total numbers

Lower half of data (11 numbers)

12.4, 13.8, 15.2, 15.2, 21.2, 31.4, 34.4, 35.6, 41, 42, 42

↑ Lower Quartile (Q1)

Median (Q2)

54

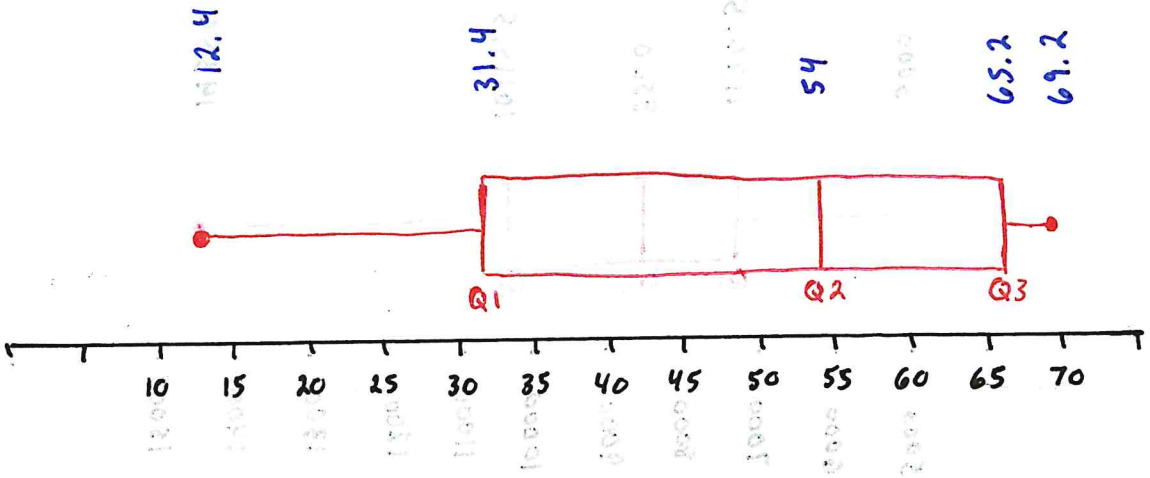
Upper half of data (11 numbers)

54.2, 54.4, 55.4, 60.4, 63.4, 65.2, 66, 66.2, 66.8, 68.4, 69.2

↑ Upper Quartile (Q3)

$IQR = Q3 - Q1 = 65.2 - 31.4 = \boxed{33.8}$

$Range = Max - Min = 69.2 - 12.4 = \boxed{56.8}$



(3) 16 total numbers

Lower half of data (8 numbers)

3093980, 3442361, 3531347, 3547446, 4364541, 4467837, 5045083, 5743719

↑ Lower Quartile (Q1)

$$\frac{3547446 + 4364541}{2} = \frac{7911987}{2}$$

$$\boxed{3955993.5}$$

Median (Q2)

$$\frac{\text{Last of Lower} + \text{First of Upper}}{2} = \frac{5743719 + 6151622}{2} = \frac{11895341}{2}$$

$$\boxed{5947670.5}$$

Upper half of data (8 numbers)

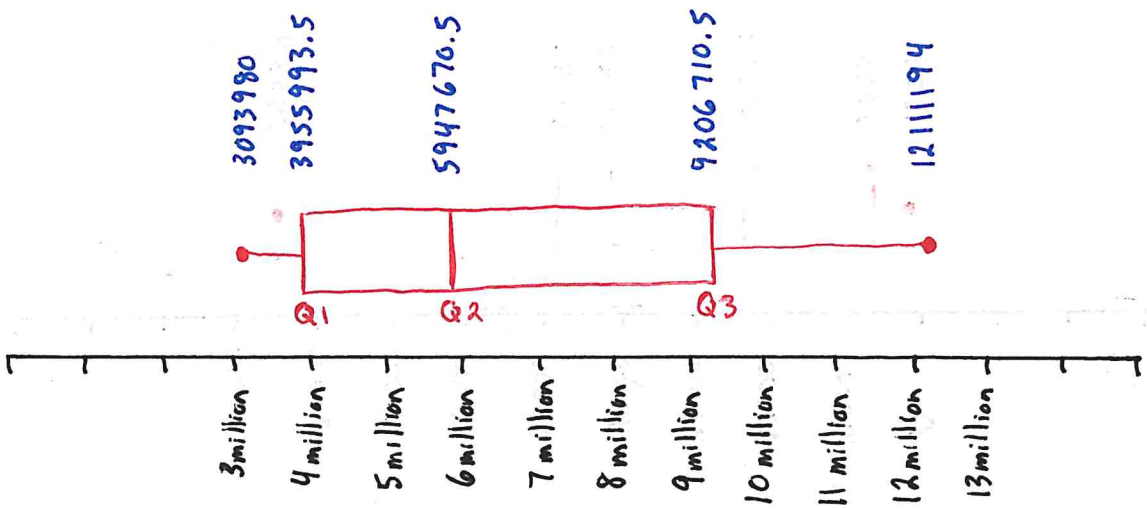
6151622, 8693387, 8874724, 9071577, 9341844, 9735000, 10467400, 12111194

↑ Upper Quartile (Q3)

$$\frac{9071577 + 9341844}{2} = \frac{18413421}{2} = \boxed{9206710.5}$$

$$IQR = Q3 - Q1 = 9206710.5 - 3955993.5 = \boxed{5,250,717}$$

$$\text{Range} = \text{Max} - \text{Min} = 12111194 - 3093980 = \boxed{9,017,214}$$



(4) 15 total numbers

Lower half of data (7 numbers)

1378, 2761, 4109, 5595, 8463, 8861, 9426

↑ Lower Quartile (Q1)

Median (Q2)

20572

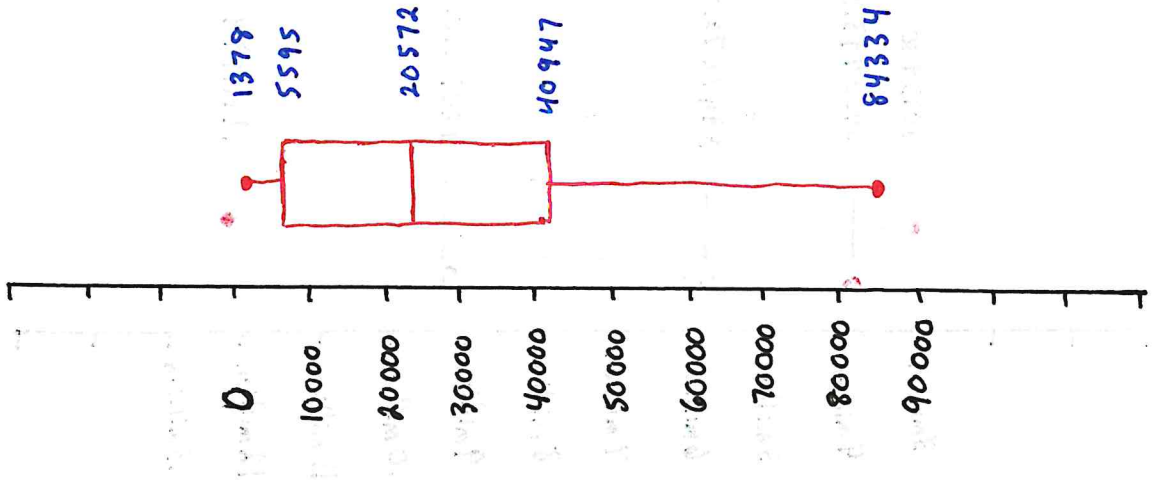
Upper half of data (7 numbers)

26352, 35978, 39816, 40947, 48477, 57522, 84334

↑ Upper Quartile (Q3)

$IQR = Q3 - Q1 = 40947 - 5595 = \boxed{35352}$

$Range = Max - Min = 84334 - 1378 = \boxed{82956}$



(5) 22 total numbers

Lower half of data (11 numbers)

39, 40, 43, 43, 44, 44, 44, 44, 45, 46, 47

↑ Lower Quartile (Q1)

Median (Q2)

$$\frac{\text{Last of lower} + \text{First of upper}}{2} = \frac{47+47}{2} = \frac{94}{2} = 47$$

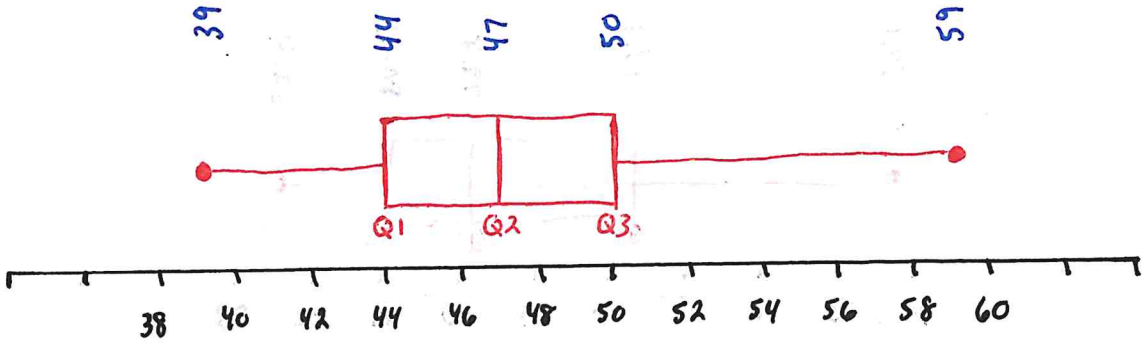
Upper half of data (11 numbers)

47, 47, 47, 48, 50, 50, 51, 53, 57, 58, 59

↑ Upper Quartile (Q3)

$IQR = Q3 - Q1 = 50 - 44 = \boxed{6}$

$\text{Range} = \text{Max} - \text{Min} = 59 - 39 = \boxed{20}$



⑥ 21 Total numbers

Lower half of data (10 numbers)

74.1, 74.2, 74.9, 77, 77.7, 77.9, 77.9, 78.2, 78.3, 79.3

↑ Lower Quartile (Q1)

$\frac{77.7 + 77.9}{2} = \frac{155.6}{2} = 77.8$

Median (Q2)

79.8

Upper half of data (10 numbers)

80.1, 80.3, 80.3, 80.4, 80.9, 81, 81.4, 81.5, 82.2, 82.4

↑ Upper Quartile (Q3)

$\frac{80.9 + 81}{2} = \frac{161.9}{2} = 80.95$

$IQR = Q3 - Q1 = \boxed{3.15}$

$Range = Max - Min = 82.4 - 74.1 = \boxed{8.3}$