

- 1) Tomas visited 5 gas stations near his house. The price of gas at each station is shown in the table above. What is the median price of gas at the stations Tomas visited?

Station Number	Gas Price (per gallon)
1	3 \$2.56
2	1 \$2.42
3	4 \$2.65
4	2 \$2.48
5	5 \$2.99

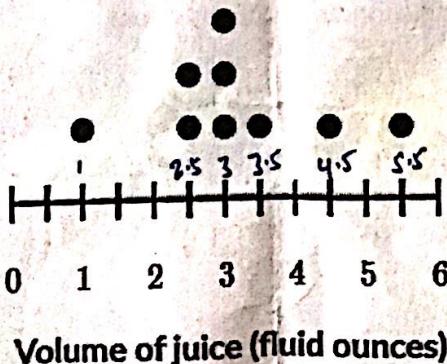
- 2) A veterinary student is studying newborn giraffes. The list above shows the masses of 6 newborn giraffes, rounded to the nearest kilogram. What is the mean mass of the newborn giraffes?

Round your answer to the nearest kilogram.

75, 70, 45, 50, 52, 68

- 3) Tayo got the following scores on her Spanish quizzes: 88, 96, 94, 92, 98, 58, 90. What is the range of Tayo's quiz scores?

- 4) The dotplot below shows the volume of juice squeezed from 9 oranges. What is the median volume of juice squeezed, in fluid ounces?



~~5)~~ Find the mean, median, mode and range for the given data:  
44, 79, 94, 43, 53, 65, 87, 90, 70, 69, 65, 89, 85, 53, 47, 61, 27, 80

~~6)~~ The weights, in grams, of seven sweet potatoes are  
260, 225, 205, 240, 232, 205, 214  
What is the median weight?

~~7)~~ The scores obtained by 10 students are 38, 47, 49, 58, 60, 65, 70, 79, 80, 92. Using the percentile formula, calculate the 70<sup>th</sup> percentile?

~~8)~~ The weights of 10 people were recorded in kg as 35, 41, 42, 56, 58, 62, 70, 71, 90, 77.  
Find the percentile for the weight 58 kg.

~~9)~~ You grow 20 crystals from a solution and measure the length of each crystal in millimeters. Here is your data: 9, 2, 5, 4, 12, 7, 8, 11, 9, 3, 7, 4, 12, 5, 4, 10, 9, 6, 9, 4  
Calculate the sample standard deviation of the length of the crystals.

~~10)~~ Listed below are the commissions earned, in dollars, last month by a sample of 15 brokers at Salomon Smith Barneys office. 2038 1758 1721 1637 2097 2047 2205  
1787 2287 1940 2311 2054 2406 1471 1460, find the inter quartile range.

~~11)~~ The following table gives the average costs of a single-lens reflex camera: 800 650  
300 430 560 470 640 830 400 280 800 410 360 600 310 370

(a) Find the quartiles Q<sub>1</sub>, Q<sub>2</sub>, and Q<sub>3</sub>.

(b) Draw a box-plot.

~~12)~~ By sampling different landscapes in a national park over a 2-year period, the number of deer per square kilometer was determined. The results were (deer per square kilometer) 30 20 5 29 58 7 20 18 4 29 22 9 Compute the range, sample mean, sample variance, and sample standard deviation.

~~13)~~ In a certain city the mean price of a quart of milk is 63 cents and the standard deviation is 8 cents. The average price of a package of bacon is \$1.80 and the standard deviation is 15 cents. If we pay \$0.89 for a quart of milk and \$2.19 for a package of bacon at a 24-hour convenience store, which is relatively more expensive?

~~14)~~ To buy a computer system, a customer can choose one of 4 monitors, one of 2 keyboards, one of 4 computers and one of 3 printers. Determine the number of possible systems that a customer can choose from.

~~15)~~ In a certain country telephone numbers have 9 digits. The first two digits are the area code (03) and are the same within a given area. The last 7 digits are the local number and cannot begin with 0. How many different telephone numbers are possible within a given area code in this country?

1) Gas price. (sorted)

\$	2.42, 2.48,	2.56,	2.65, 2.99
	1      2	3	4      5

$$\boxed{\text{Median} = \$2.56}$$

; since odd no. of data set.

Median is the middle element in data set when it is sorted.

3

2)

 $x_i$ 

75

70

45

50

52

68

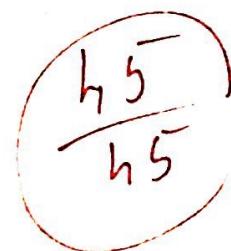
$$\sum x_i = 360$$

$$n = 6$$

$$\text{Mean} = \frac{\sum x_i}{n} = \frac{360}{6} = \boxed{60 = \bar{x}} \quad \text{mean mark}$$

~~kg~~

3

3) Tayo: Range

58, 88, 90, 92, 94, 96, 98 (sorted)

$$\begin{aligned} \text{Range} &= \text{Max} - \text{Min} \\ &= 98 - 58 \end{aligned}$$

$$\boxed{\text{Range} = 40}$$

3

4) Median Volum of juice squen  
→ Representing in numbers

1, 2.5, 2.5, 3,	3, 3, 3.5, 4.5, 5.5
n=9      1      2      3      4	5      6      7      8      9

$$\boxed{\text{Median} = 3 \text{ fluid ounces}}$$

Volume

3

(5)

2	27
3	43, 44, 47
4	53, 53,
5	65, 65, 69, 61
6	79, 70
7	85, 87, 89, 80
8	90, 94

Sorted Data

1	27
2	43
3	44
4	47
5	53
6	53
7	61
8	65
9	65
10	69
11	70
12	79
13	80
14	85
15	87
16	89
17	90
18	94

 $n = 18$ 

1201

$$\text{Mean} = \frac{\sum x_i}{n} = \frac{1201}{18}$$

$$\bar{x} = 66.72$$

median  
since even no. of scores.

$$\text{Median} = \frac{x_9 + x_{10}}{2} = \frac{65 + 69}{2}$$

$$\text{Median} = 67$$

Mode

Bi-Modal dataset

where

$$\text{Mode} = 53, 865$$

where both frequency is 2.

Range

$$= \text{Max} - \text{Min}$$

$$= 94 - 27$$

$$\text{Range} = 67$$

3

(6) Median of 7 potatoes

sorted : 205, 205, 214, 225, 232, 240, 260

1	2	3	4	5	6	7
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$$\text{Median} = 225$$

3

7)  $n=10$

date	Score	1	2	3	4	5	6	7	8	9	10
		38	47	49	58	60	65	70	79	80	92

To find: 70<sup>th</sup> percentile

$$l_p = \frac{P}{100} (n+1)$$

$$l_{70} = \frac{70}{100} \times 11$$

$$l_{70} = 7.7$$

l.f.

$$Y_p = x_i + f_p (x_{i+1} - x_i)$$

$$= x_7 + 0.7 (x_8 - x_7)$$

$$= 70 + 0.7 (79 - 70) \quad 3$$

70<sup>th</sup> percentile.

$$Y_{70} = 76.3$$

8)  $n=10$

35	41	42	56	58	62	70	71	90	77.
----	----	----	----	----	----	----	----	----	-----

sorted

1	2	3	4	5	6	7	8	9	10
35	41	42	56	58	62	70	71	77	90

to find percentile for 58 kg

$$PR_{58} = \frac{C_5 + 0.5 f_{58}}{n} \times 100$$

$$PR_{58} = \frac{C_5 + 0.5 f_{58}}{10} \times 100$$

$$= \frac{4 + 0.5(1)}{10} \times 100$$

$$PR_{58} = 45 \text{ percentile}$$

3

9

1	
2	2
3	3
4	4, 4, 4, 4
5	5, 5
6	6,
7	7, 7
8	8
9	9, 9, 9, 9,
10	10
11	11
12	12, 12

Scores sorted.  
(Deviation)

$x_i$	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
2	-5	25
3	-4	16
4	-3	9
4	-3	9
4	-3	9
4	-3	9
5	-2	4
5	-2	4
6	-1	1
7	0	0
7	0	0
8	+1	1
9	+2	4
9	+2	4
9	+2	4
9	+2	4
10	+3	9
11	+4	16
12	+5	25
12.	+5	25

$$\text{Mean} = \frac{\sum x_i}{n} = \frac{140}{20} = \bar{x} = 7$$

$$\text{if for population} \\ \text{Variance} = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{178}{20}$$

$$S^2 = 8.9$$

Std. deviation

$$S = \sqrt{\text{variance}} \\ = \sqrt{S^2} \\ = \sqrt{8.9}$$

$$\text{Std. dev} \quad S = 2.98$$

~~if considered a sample~~

$$n \rightarrow n-1.$$

$$\text{variance } S^2 = \frac{178}{20} \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1} \\ = \frac{178}{19}$$

$$S^2 = 9.3$$

$$S = \sqrt{\text{variance}} = \sqrt{9.3}$$

$$S = 3.04$$

3

$$\sum x_i = 140$$

$$n = 20$$

$$\sum (x_i - \bar{x})^2 = 178$$

Sorted dataset

(3)

1460	1471	1637	1721	1758
1787	1940	2038	2047	2054
2097	2205	2287	2311	2406

Inter Quartile range

$$= Q_3 - Q_1$$

$$= Y_{75} - Y_{25}$$

$$= 2205 - 1721$$

$$IQR = 484$$

3

$y_{25}$

$$l_{25} = \frac{25}{100} (16) \quad ^{15+1}$$

$$l_{25} = 4.$$

$$Y_{25} = 1721 = x_4$$

$y_{75}$

$$l_{75} = \frac{75}{100} (16) \quad ^{15+1}$$

$$l_{75} = 12$$

$$Y_{75} = x_{12}$$

$$Y_{75} = 2205$$

①  
sorted

280

300

310

360

370

400

410

430

470

560

600

640

650

800

800.

830

$n = 16$

$$l_p = \frac{P}{100}(n+1)$$

$$y_p = x_i + f_p(x_{i+1} - x_i)$$

$$Q_1 = y_{25}$$

~~$f_p$~~

$$l_{25} = \frac{25}{100}(16+1)$$

$$l_{25} = 4.25$$

$$y_{25} = x_4 + 0.25(x_5 - x_4)$$

$$= 360 + 0.25(370 - 360)$$

$$Q_1 = y_{25} = 362.5$$

~~~~~

$$Q_2 = y_{50}$$

$$l_{50} = \frac{50}{100}(17)$$

$$l_{50} = 8.5$$

$$y_{50} = x_8 + 0.5(x_9 - x_8)$$

$$= 430 + 0.5(470 - 430)$$

$$Q_2 = y_{50} = 450$$

~~~~~

$$Q_3 = y_{75}$$

$$l_{75} = \frac{75}{100}(17)$$

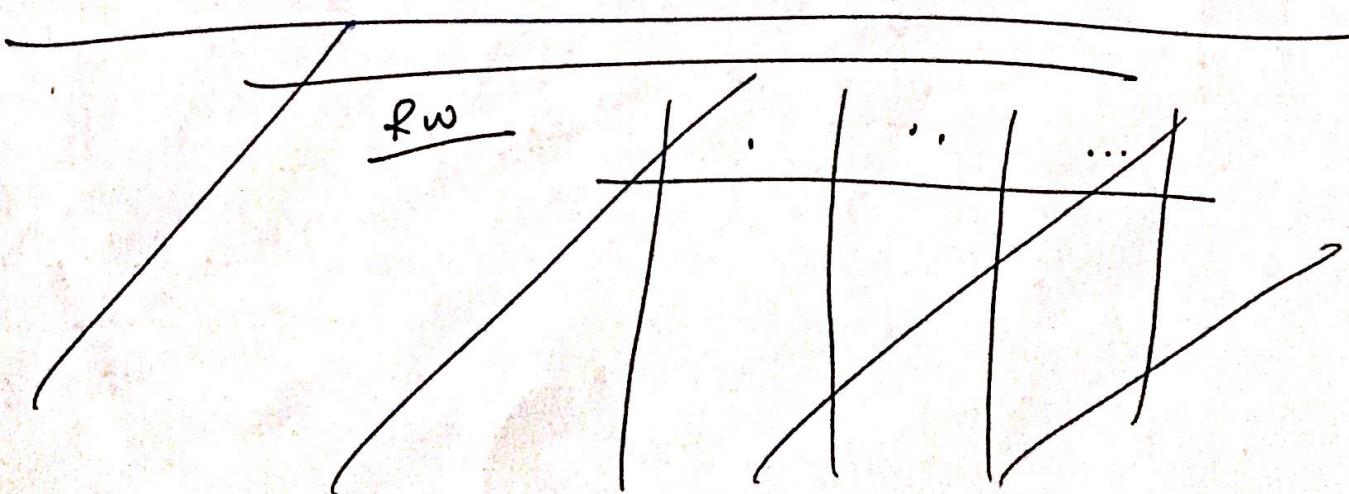
$$l_{75} = 12.075$$

$$y_{75} = x_{12} + 0.75(x_{13} -$$

$$= 640 + 0.75(650)$$

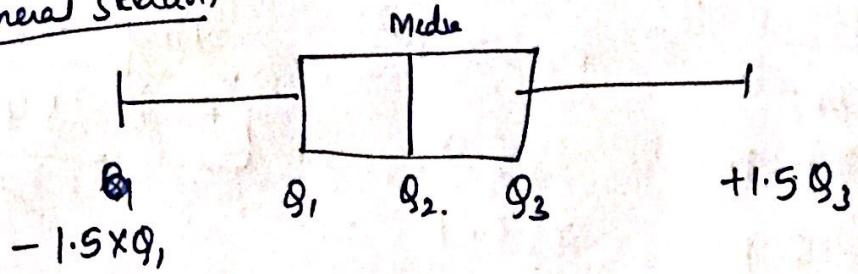
$$y_{75} = 647.5$$

~~~~~



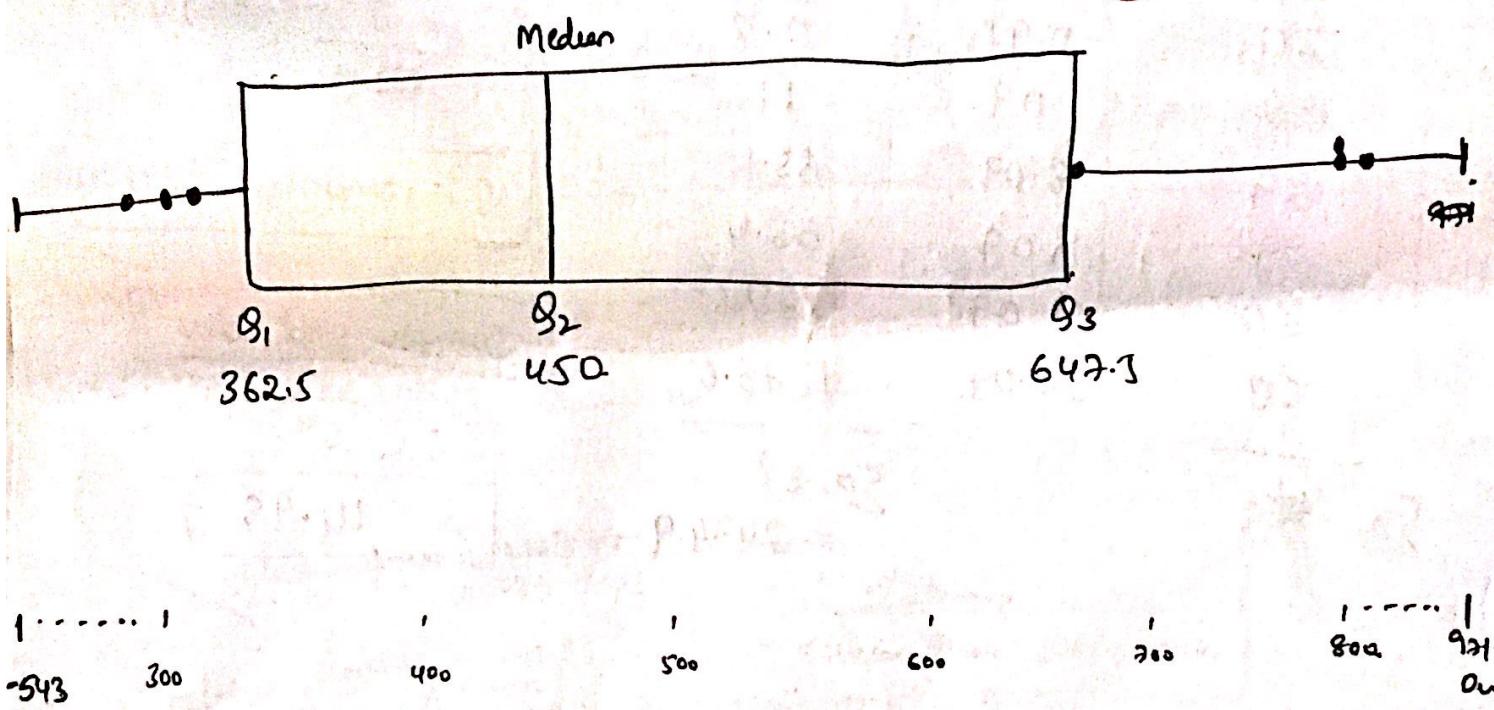
b) boxplot

General skeleton



No outliers found.

3



(12)

sample∴  $\leftrightarrow$ 

$$n = 12$$

sorted  
 $x_i$ 

4

5

7

9

18

20

20

22

29

29

30

58.

$$x_i - \bar{x}$$

$$-16.91$$

$$-15.9$$

$$-13.91$$

$$-11.91$$

$$-2.91$$

$$-0.91$$

$$-0.91$$

$$1.09$$

$$8.09$$

$$8.09$$

$$9.09$$

$$37.09$$

$$(x_i - \bar{x})^2$$

$$285.9$$

$$253.1$$

$$193.4$$

$$141.8$$

$$8.4$$

$$0.8$$

$$0.8$$

$$1.1$$

$$65.4$$

$$65.4$$

$$82.6$$

$$1375.6$$

$$\sum (x_i - \bar{x})^2$$

$$= 2474.9$$

$$\sum x_i = 251$$

$$\bar{x} \text{ Mean} = \frac{\sum x_i}{n} = \frac{251}{12} = 20.91$$

$$\text{Range} = \text{Max} - \text{Min}$$

$$\text{Range} = 54$$

sample variance

$$S^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$$

$$= \frac{1}{12-1} (2474.9)$$

$$S^2 = \text{variance} = 204.9$$

sample std. dev

$$S = \sqrt{S^2}$$

$$S = 14.99$$

3

(13)

$$\bar{x} = 63 \text{ cent} \\ = 1.80 \$$$

$$S = 8 \text{ cent.} \\ \cdot 15 \text{ cent.}$$

Milk. (cent) (quant) ⑤  
Bacon. (\$) (package)

\$ 0.89 for quart of milk.  
\$ 2.19 for pack of bacon.

1 \$ = 100 cents

| Milk price in \$                  |               | Mean.     | Max             |                        |
|-----------------------------------|---------------|-----------|-----------------|------------------------|
| if we pay.                        | $\bar{x} - S$ | $\bar{x}$ | $\bar{x} + S$ . |                        |
| 0.89.<br><del>der + 0.26 \$</del> | 0.55          | 0.63      | 0.71.           | Milk (\$)<br>per quart |
| 2.19.<br><del>der + 0.39.</del>   | 1.65          | 1.8       | 1.95            | Bacon.<br>per package. |

All in \$

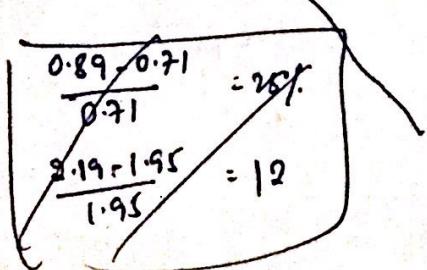
~~Slope of Quant~~  $= (0.89 - 0.63)$

relative milk %  $\frac{+0.26}{0.63}$  Milk  
expen 41% more than avg pric

$\Rightarrow 2.19 - 1.8 \rightarrow$  bacon  $\frac{+0.39}{1.8}$ , 21% more than avg pric 3

Milk @ \$ 0.89 is relatively more expensive

than bacon. in % to mean pric )



~~Milk relatively more expensive than bacon~~  
while is absolute terms  
bacon is more expensive (+ 0.39 \$) than milk (+ 0.26 \$)

14

Buy Comput system

1 of 4 monitor

2 keyb.

4 computer / CPU

3 prntr

$$\text{Total possible} = 4 \times 2 \times 4 \times 3$$

= 96 ways we can buy diff possible systems

3

15

9 digit way

|   |   |   |    |    |    |    |    |    |
|---|---|---|----|----|----|----|----|----|
| 0 | 3 | 9 | 10 | 10 | 10 | 10 | 10 | 10 |
|---|---|---|----|----|----|----|----|----|

area  
code      0X  
can't be  
zero.

3

0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

$$9 \times 10^6.$$

= 9,000,000 ways / sequence of

telephone no. of are possible