07/15/2019

Measures of Variation

Std deviation : "On Average how far something is away from the mean".

Std deviation = $\sqrt{\text{variance}}$

var = $(\text{std})^2$

{ std = 9
  var = 81

var = 25
std = 5

Measures of variation tells you how far the data is spread out.

Range = Max - min

Population

N = 10

μ mean = 41.5

Std dev pop^2 = 6 = $\sqrt{\frac{\sum (x_i - \mu)^2}{N}}$ = 10.5

Std dev sample = s

Salary(x)	Deviation $(x-\mu)$	Squares $(x-\mu)^2$
40	-1.5	2.25
23	-18.5	342.25
41	-0.5	.25
50	8.5	72.25
49	7.5	56.25
32	-9.5	90.25
41	-0.5	.25
29	-12.5	156.25
52	10.5	110.25
58	16.5	272.25
	$\Sigma(x-\mu)=0$	$\Sigma(x-\mu)^2 = 1102.5$

$$\sigma = \sqrt{\frac{\Sigma(x-\mu)^2}{N}} = \sqrt{\frac{1102.5}{10}} = 10.5$$

Interpret

On avg there is a spread of $10500 from the mean of $41500 salary at the corporation.

Range: the difference between max and min salaries at corporation is $35000.

Population	Sample
N	n
μ	$\bar{x}$
$\sigma = \sqrt{\frac{(x-\mu)^2}{N}}$	$s_{\bar{x}} = \sqrt{\frac{(x-\mu)^2}{n-1}}$,

Ex: 2

$n = 9$

$\bar{x} = 343$ cal

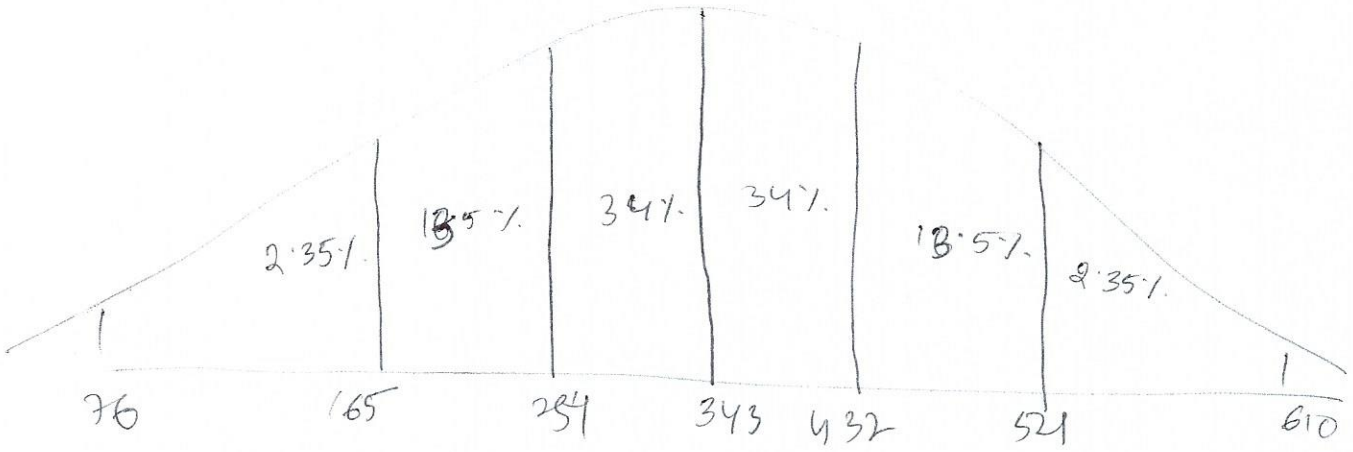
$s_{\bar{x}} = \sqrt{\frac{63006}{8}} = 88.75$

Total Calories	$(x-\bar{x})$	$(x-\bar{x})^2$
383	40	1600
300	-43	1849
460	117	13689
310	-33	1089
500	157	24649
267	-76	5776
255	-88	7744
262	-81	6561
350	7	49
	$\Sigma(x-\bar{x}) = 0$	$\Sigma(x-\bar{x})^2 = 63006$

Var = 7875.75

Interpret:

On Avg there was a spread of a total of 88.75 cal in the given sample of fast food restaurants from a mean of 343 cal in a burger.

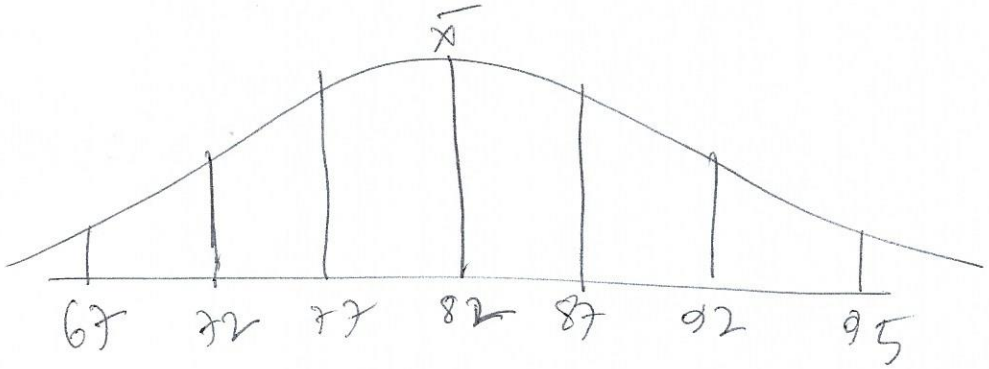


68%: 254-432

95%: 165-521

99.5%: 76-610

Ex 3



Ex 4

68 + 27 = 95% is between 75 & 101.

95% of all nonxhold pay between $ 75 & $101 son ele.

Point A $\bar{x} = 35$

$s_x = 18.7$

Point B

$\bar{x} = 35$

$s_y = 7$

Ex 1 88% of the sample made below your score. 12% made above your score.

$$\text{Percentile of } x = \frac{\#\text{ of values less than } x}{\text{total \# of values}} * 100$$