Statistics

Spring 2023

Lecture 8

Feb 19-8:47 AM

Clear all lists [2nd] [+] [4: clear all lists] [Enter]

Reset all lists [STAT] Edit [5: SetUpEditor] [Enter]

Store the following sample in L1.

54	62	75	70	83
50	45	59	65	68
72	48	77	80	49
88	90	100	95	42

[STAT] Edit [1: Edit]

L1

54 [enter]

62 [enter]

⋮

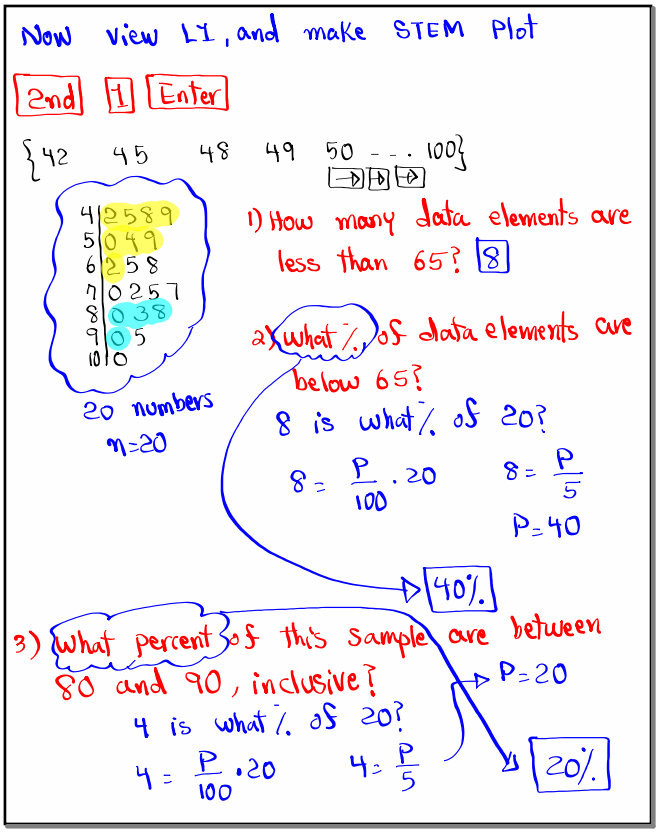
42 [enter]

Now quit & Clear the Screen

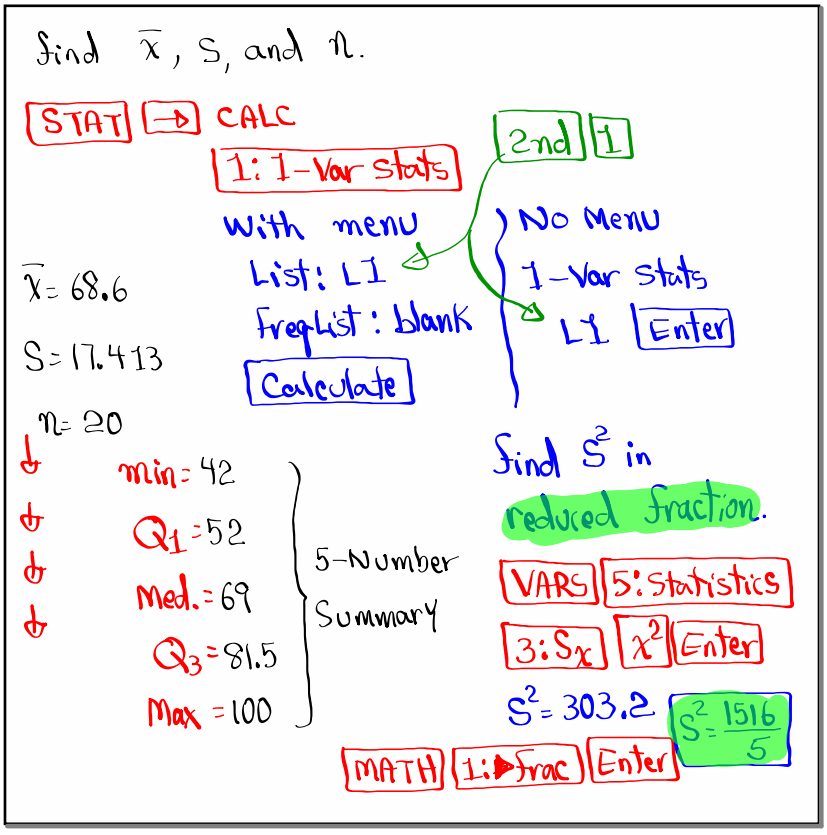
[2nd] [MODE] [clear]

Sort L1 [STAT] Edit [2: SortA(] [2nd] [1] [Enter]

Feb 16-7:16 AM



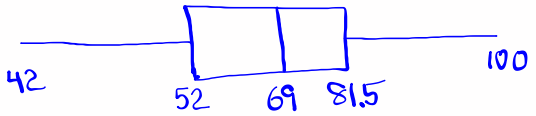
Feb 16-7:25 AM



Feb 16-7:35 AM

1) Draw Box Plot

min = 42
Q_1 = 52
Med. = 69
Q_3 = 81.5
Max = 100



2) $IQR = Q_3 - Q_1$
$= 81.5 - 52 =$ **29.5**

3) Upper Fence $= Q_3 + 1.5(IQR) = 81.5 + 1.5(29.5) =$ **125.75**

4) Lower Fence $= Q_1 - 1.5(IQR) = 52 - 1.5(29.5) =$ **7.75**

5) Discuss any possible outliers.

No outliers

Feb 16-7:44 AM

Complete the chart below:

Class BNDRS	Class MP	Class F	Cum. F	Rel. F	% F
7.5 - 13.5	10.5	5	5	.125	12.5%
13.5 - 19.5	16.5	12	17	.300	30.0%
19.5 - 25.5	22.5	13	30	.325	32.5%
25.5 - 31.5	28.5	10	40	.250	25.0%

6 6 6

Class MP $= \frac{\text{+class BNDRS}}{2}$ CW = 6 n = 40 Rel. F $= \frac{F}{40}$

what % of data elements are between 13.5 and 25.5? 30.0% + 32.5% = **62.5%**

Feb 16-7:56 AM

Find $\bar{x}$, S, and n by using class MP & Class F.

Clear all lists
Reset all lists
Class MP → L1 ✓
Class F → L2 ✓

STAT → CALC
1: 1-Var Stats

With Menu
List: L1
Freq List: L2
Calculate

No Menu
1-Var Stats
L1 , L2
Enter

$\bar{x} = 20.7$
$S = 5.954$
$n = 40$

Find S^2 in reduced fraction.

VARS | 5: Statistics | 3: S_x
x^2 | MATH | 1: ▶Frac | Enter

$S^2 = \frac{2304}{65}$

Feb 16-8:05 AM

How to estimate Sample Standard deviation:

$S \approx \frac{\text{Range}}{4}$

S

"The range rule-of-thumb"

Ex: A sample has a min of 24 and max of 96.

1) Find its range. Range = Max − Min = 96 − 24 = 72

2) Estimate its Standard deviation.

$S \approx \frac{\text{Range}}{4} = \frac{72}{4} = 18$

Feb 16-8:13 AM

Empirical Rule:

About 68% of data elements are within

$\bar{x} \pm s$

About 95% of data elements are within

$\bar{x} \pm 2s$

Usual Range

About 99.7% of data elements are within

$\bar{x} \pm 3s$

It is best when data distribution is symmetric. (Mean = Mode = Median)

Feb 16-8:18 AM

I randomly selected 60 exams. Scores had a mean of 82 with standard deviation of 6. Assume scores had a symmetric dist.

1) 68% Range $\Rightarrow \bar{x} \pm s = 82 \pm 6$

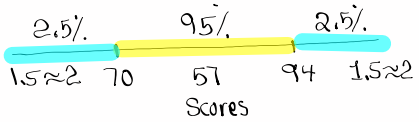
$\Rightarrow$ 76 to 88

2) 95% Range $\Rightarrow \bar{x} \pm 2s = 82 \pm 2(6)$

$= 82 \pm 12$

$\Rightarrow$ 70 to 94

Usual Range



60 exams

60(.95) = 57

3) 99.7% Range $\Rightarrow \bar{x} \pm 3s$

$82 \pm 3(6) = 82 \pm 18$

$\Rightarrow$ 64 to 100

Feb 16-8:25 AM