Statistics

Lecture 3

Feb 19-8:47 AM

Class Qz 2 (open notes)

Consider the Sample below

1 2 2 2 8

$n = 5$

Mode = 2

Range = 8 − 1 = 7

Midrange = $\frac{8+1}{2} = 4.5$

Median = 2

1) $\Sigma x = \boxed{15}$ ✓

2) $\Sigma x^2 = \boxed{77}$ ✓

3) $\bar{x} = \frac{\Sigma x}{n} = \frac{15}{5} = \boxed{3}$ ✓

4) $s^2 = \frac{n\Sigma x^2 - (\Sigma x)^2}{n(n-1)} = \frac{5 \cdot 77 - 15^2}{5(5-1)} = \frac{160}{20} = \boxed{8}$ ✓

$s = \sqrt{s^2} = \sqrt{8} \approx 3$

Estimate $s \approx \frac{\text{Range}}{4} = \frac{7}{4} = 1.75 \approx 2$

Mar 6-10:57 AM

TI instructions:

1) To clear the Screen [Clear]

2) To quit [2nd] [MODE]

3) To clear all lists [2nd] [+] [4:ClearAllLists] [Enter]

4) To reset all lists [STAT] Edit [Enter]
[5:SetupEditor]

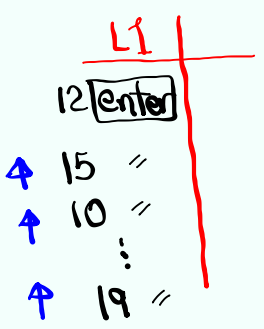
Mar 13-8:14 AM

How to store data in a list

Store the Sample below in [L1]
List 1

12 15 10 18 11
20 25 15 18 19

[STAT] Edit
[1:Edit]



Let's quit & clear the Screen
[2nd] [MODE] [clear]

Mar 13-8:20 AM

To view a list:

2nd [1] Enter

L1

{12 15 10 18 . . . 19}

How to Sort a list:

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

L1

Let's view L1, and make Stem Plot

2nd [1] Enter

L1

{10 11 12 15 . . . 25}

1 | 0 1 2 5 5 8 9

2 | 0 5

Mar 13-8:26 AM

How to find $\bar{x}$ & S:

STAT → CALC 1:1-Var Stats

2nd [1]

With menu: List: L1

No Menu: L1 Enter

Freq List: Clear

Calculate

$\bar{x} = 16.3$

$S = S_x = 4.620$

Min = 10

$Q_1 = 12$

Med. = 16.5

$Q_3 = 19$

Max = 25

} 5-Number Summary

$n = 10$

What about S^2?

VARS

5: Statistics

3: S_x

x^2 Enter

$S^2 = 21.3\overline{4}$

To convert to a reduced fraction

Math 1: ▶Frac Enter

$S^2 = \frac{1921}{90}$

Mar 13-8:34 AM

I surveyed 20 students, here are their ages:

23	27	18	20	30
32	25	19	35	20
40	43	50	15	19
25	30	35	48	40

Store this in a list.

clear all lists

2nd + 4:clear All lists

Enter

STAT Edit

1:Edit

L1
23
27
18
⋮
40

quit

2nd Mode

Mar 13-8:46 AM

Sort L1, View L1, and make Stem Plot

STAT Edit

2:SortA(

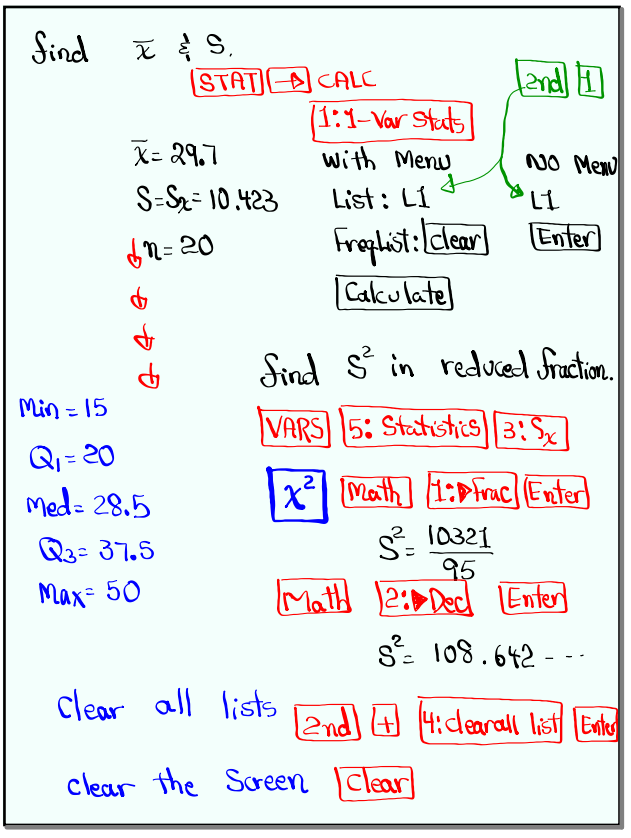
2nd 1 Enter

2nd 1 Enter

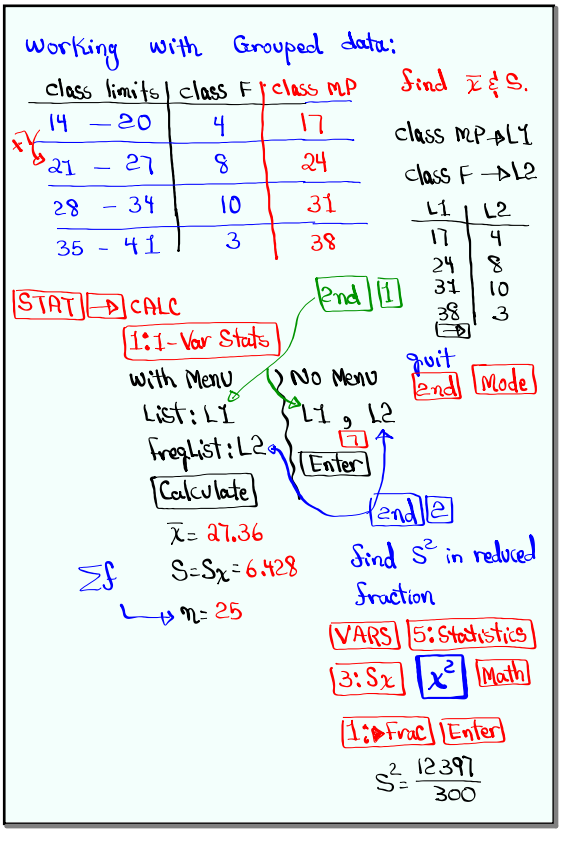
{15 18 19 19 20

1	5899
2	003557
3	00255
4	0038
5	0

Mar 13-8:52 AM



Mar 13-8:57 AM



Mar 13-9:20 AM

Complete the chart below ✓CW = 10, n = 30

class limits	class BNDRS	class MP	class F	Cum. F	Rel. F	%F
50 – 59	49.5–59.5	54.5	8	8	.267	26.7%
60 – 69	59.5–69.5	64.5	12	20	.400	40.0%
70 – 79	69.5–79.5	74.5	10	30	.333	33.3%

Rel. F = $\frac{f}{n} = \frac{f}{30}$

Find $\bar{x}$, S, and S^2 of this grouped data.

clear all my lists [2nd] [+] [4:clearall lists] [Enter]

class MP → L1
class F → L2

L1	L2
54.5	8
64.5	12
74.5	10

$\bar{x} = 65.1\overline{6}$
$S = Sx = 7.849$
$n = 30$
$S^2 = \frac{5360}{87}$

[STAT] [→] CALC
[1:1-Var Stats]
List: L1
FreqList: L2
[Calculate]

no Menu
L1, L2 [enter]
[1]

Mar 13-9:34 AM

I randomly selected 28 exams. Here are the Scores

75	83	90	65
55	100	70	80
95	98	58	60
68	50	72	83
93	100	99	90
72	85	89	74
69	73	88	88

Store in L1 ✓
Sort L1 ✓
View L1 ✓
Make Stem Plot

5	0 5 8
6	0 5 8 9
7	0 2 2 3 4 5
8	0 3 3 5 8 8 9
9	0 0 3 5 8 9
10	0 0

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5	0 5 8
6	0 5 8 9
7	0 2 2 3 4 5
8	0 3 3 5 8 8 9
9	0 0 3 5 8 9
10	0 0

1) P_{30}

$L = \frac{30}{100} \cdot 28 = 8.4$

$L = 9$ P_{30} = 9th element = 72

2nd 1 (9 Enter

2) Median P_{50}

$L = \frac{50}{100} \cdot 28 = 14$

$P_{50} = \frac{14\text{th} + 15\text{th}}{2} = \frac{80 + 83}{2} = 81.5$

2nd Enter change 9 to 14 enter

14 = 15

Mar 13-9:59 AM

5	0 5 8
6	0 5 8 9
7	0 2 2 3 4 5
8	0 3 3 5 8 8 9
9	0 0 3 5 8 9
10	0 0

Find the percentile ranking of 65. → Find K such that $P_K = 65$

$K = \frac{B}{n} \cdot 100$ (B = # Below), Round to whole %.

$K = \frac{4}{28} \cdot 100 = 14.285\ldots \approx 14$

14% | 86%

$P_{14} = 65$

Find K such that $P_K = 88$.

$K = \frac{B}{n} \cdot 100 = \frac{17}{28} \cdot 100 = 60.714 \approx 61$

$P_{61} = 88$

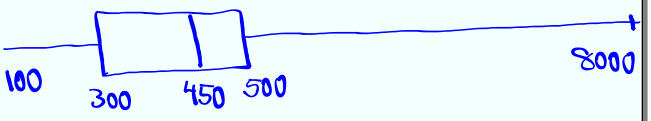
61% | 39%

Mar 13-10:04 AM

Consider the following 5-number Summary

100 300 450 500 8000

Box Plot



$IQR = Q_3 - Q_1 = 500 - 300 = 200$

Upper fence $= Q_3 + 1.5(IQR) = 500 + 1.5(200) = 800$

Lower fence $= Q_1 - 1.5(IQR) = 300 - 1.5(200) = 0$

Possible outliers Range

800 – 8000

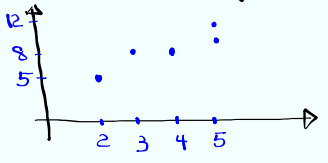
Mar 13-10:14 AM

Working with ordered-Pairs (x, y)

x	y
2	5
3	8
4	8
5	12
5	10

1) $n = 5$

2) Plot these Points (Scatter Plot)



Clear all lists

$x \to L1$, $y \to L2$

STAT → CALC

2: 2-Var Stats

with Menu

xlist : L1

Ylist : L2

Freqlist : Clear

Calculate

No Menu

L1 , L2 enter

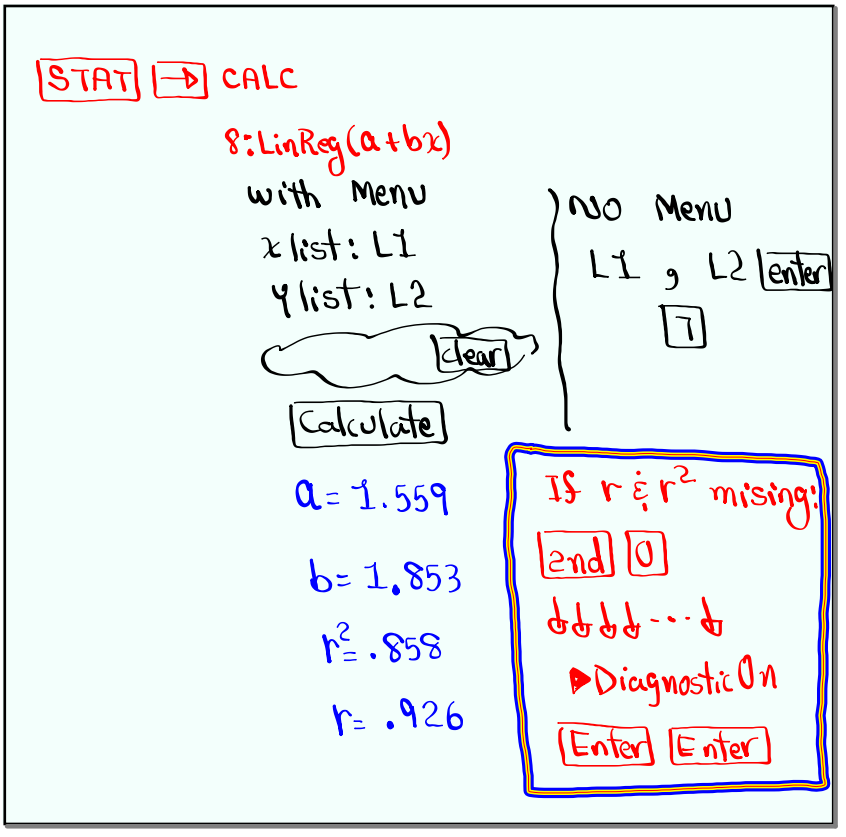
1

$\Sigma x = 19$ $\Sigma y = 43$

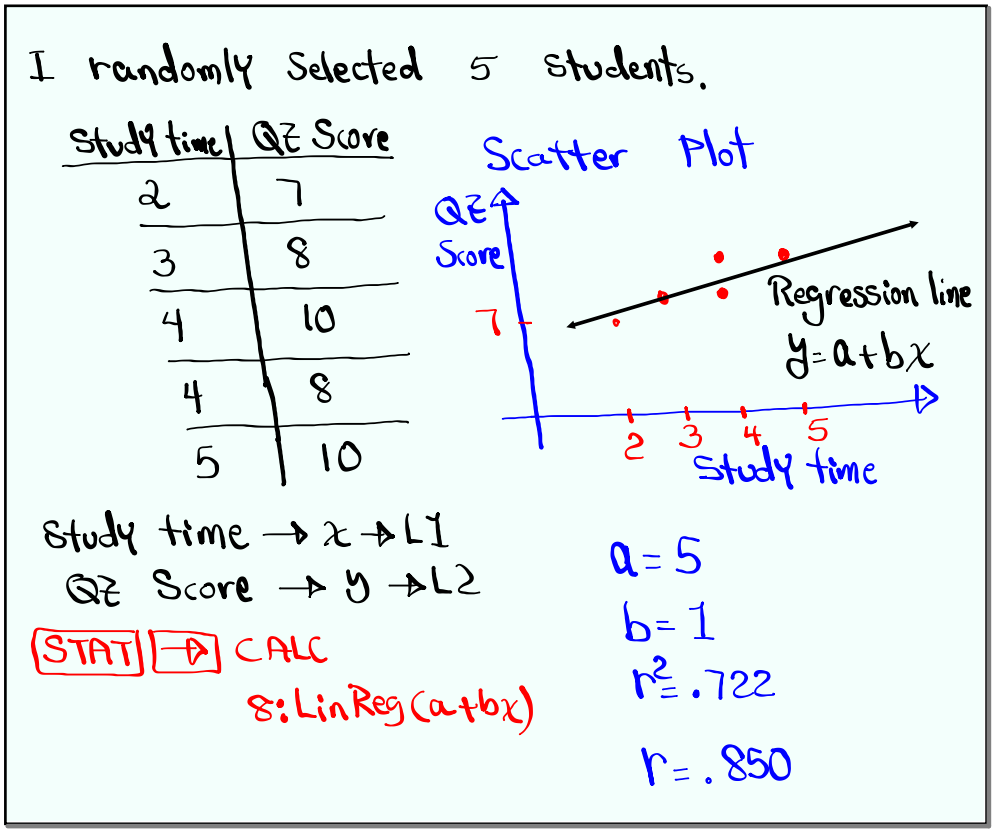
$\Sigma x^2 = 79$ $\Sigma y^2 = 397$

$n = 5$ $\Sigma xy = 176$

Mar 13-10:31 AM



Mar 13-10:40 AM



Mar 13-10:46 AM

Class QZ 3 (open notes)

use the Sample below

28	32	20	18
25	19	30	45
35	26	18	35
48	50	36	38

Find

1) $\bar{x} = 31.4375 \approx \boxed{31}$

2) $S = S_x = 10.405 \approx \boxed{10}$

} Round to whole

3) $S^2 = \boxed{\frac{8661}{80}}$

} Reduced fraction

Mar 13-10:54 AM