

Statistics

Lecture 7



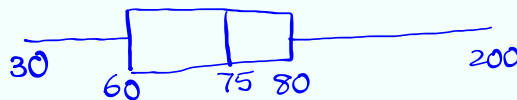
Feb 19-8:47 AM

Class QZ 2

A Sample has the following 5-number Summary

Min	Q ₁	Med	Q ₃	Max
30	60	75	80	200

1) Draw its Box Plot



3) Find its upper fence

$$UF = Q_3 + 1.5(IQR) \\ = 80 + 1.5(20) = 110$$

2) Find its IQR

$$IQR = Q_3 - Q_1 \\ = 80 - 60 = 20$$

4) Find its lower fence

$$LF = Q_1 - 1.5(IQR) \\ = 60 - 1.5(20) = 30$$

Outliers Below 30 or above 110

None
Min = 30

110 - 200

Sep 24-8:52 AM

Store the following in a list

28 32 15 40 45

20 30 50 48 18

Find

$$\bar{x} = 32.6$$

$$S = 12.730$$

$$S^2 \text{ (Reduced Fraction)}$$

$$= \frac{7292}{45}$$

$$\bar{x} \approx 33$$

$$S \approx 13$$

$$68\% \text{ Range} \rightarrow \bar{x} \pm S = 33 \pm 13 \rightarrow \boxed{20 - 46}$$

$$\text{Usual Range} \rightarrow \bar{x} \pm 2(S) = 33 \pm 2(13) \rightarrow \boxed{7 - 59}$$

95% Range

Sep 24-10:49 AM

Complete the chart below

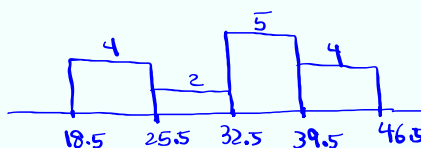
class BNDRS	class MP	class F	Cum. F
18.5 - 25.5	22	4	4
25.5 - 32.5	29	2	6
32.5 - 39.5	36	5	11
39.5 - 46.5	43	4	15

$$CW = 7$$

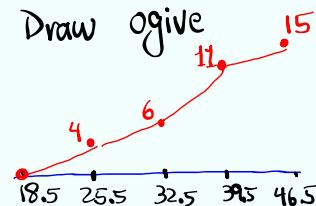
$$n = 15$$

4 classes

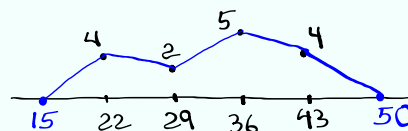
Draw histogram



Draw ogive



Freq. Polygon



Sep 24-10:56 AM

class MP $\rightarrow$ L1

class F $\rightarrow$ L2

STAT $\rightarrow$ CALC

use 1-Var Stats with L1 & L2 to find

$$\bar{x} = 33.2 \quad S = 8.283 \quad n = 15 \quad S^2 \text{ (Reduced Fraction)}$$

$$\bar{x} \approx 33 \quad S \approx 8$$

$$S^2 = \frac{343}{5}$$

Find Z-Score for data element 20.

$$Z = \frac{x - \bar{x}}{S} = \frac{20 - 33}{8} = -\frac{13}{8} = -1.625 \text{ usual element}$$

Find the data element with Z-Score 1.5.

$$Z = \frac{x - \bar{x}}{S} \quad 1.5 = \frac{x - 33}{8}$$

$$x - 33 = 8(1.5)$$

$$x = 33 + 8(1.5)$$

$$= 45 \text{ usual } -2 \leq Z \leq 2$$

Sep 24-11:13 AM

Store the Sample below in a list, then sort it, and make Stem Plot

$n = 20$

72	58	65	100	52	5 289
90	70	88	95	80	6 0569
59	60	66	69	74	7 024
98	100	86	88	90	8 0688
					9 0058
					10 00

$$\text{Range} = 100 - 52 = 48$$

$$\text{Estimate } S \approx \frac{\text{Range}}{4} = \frac{48}{4} = 12$$

use 1-Var Stats with L1 only to find

$$\bar{x} = 78$$

$$S = 15.362$$

$$n = 20$$

find S^2 in reduced fraction

$$S^2 = 236$$

$$\text{Min} = 52$$

$$Q_1 = 65.5$$

$$\text{Med} = 77$$

$$Q_3 = 90$$

$$\text{Max} = 100$$

Sep 24-11:25 AM

5 | 289
6 | 0569
7 | 024
8 | 0688
9 | 0058
10 | 00

1) Find P_{30} whole #
 $L = \frac{30}{100} \cdot 20 = 6$
 $P_{30} = \frac{6\text{th} + 7\text{th}}{2} = \frac{66 + 69}{2} = 67.5$

2) Find P_{68} Decimal
 $L = \frac{68}{100} \cdot 20 = 13.6$ $L = 14$
 $P_{68} = 14\text{th element} = 88$
 [2nd] [1] [] 14 [enter]
 L1 [8]

3) Find K Such that
 $P_K = 80$
 $K = \frac{B}{n} \cdot 100$ Round to whole %
 $K = \frac{10}{20} \cdot 100 = 50$
 $P_{50} = 80$

Sep 24-11:37 AM

Working with ordered-Pairs
 (x, y)

$(1, 5), (2, 8), (4, 8), (5, 12)$

x	y	x^2	y^2	$x \cdot y$
1	5	1	25	5
2	8	4	64	16
4	8	16	64	32
5	12	25	144	60

$\sum x = 12$ $\sum y = 33$
 $\sum x^2 = 46$ $\sum y^2 = 297$
 $n = 4$ $\sum xy = 113$

Plot these Points

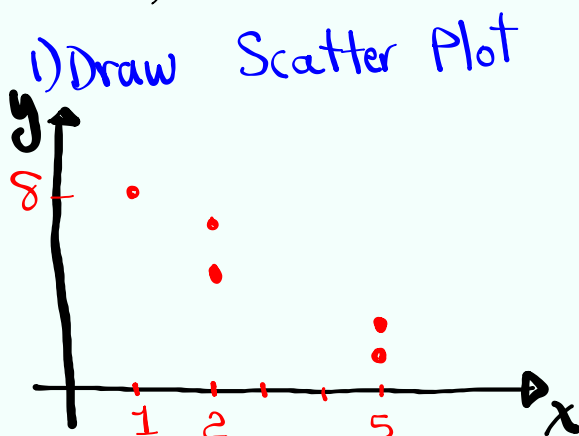
Clear all lists
 $x \rightarrow L1$, $y \rightarrow L2$
 [STAT] [→] CALC
 [2:2-Var Stats]
 with Menu
 x list: L1
 y list: L2
 Freq list: [clear]
 [Calculate]

No Menu
 $L1, L2$
 [] [enter]
 Scatter Plot
 $\sum x = 12$
 $\sum x^2 = 46$
 $n = 4$
 $\sum y = 33$
 $\sum y^2 = 297$
 $\sum xy = 113$

Sep 24-11:46 AM

Consider the Sample of
ordered-Pairs below

$(1,8)$, $(2,6)$, $(2,4)$, $(5,2)$, $(5,1)$



2) $x \rightarrow L1$, $y \rightarrow L2$

use 2-Var Stats

with $L1 \& L2$

$$\sum x = 15 \quad \sum y = 21$$

$$\sum x^2 = 59 \quad \sum y^2 = 121$$

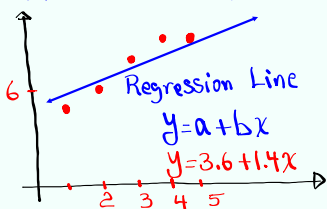
$$n = 5 \quad \sum xy = 43$$

Sep 24-11:59 AM

Consider the chart below

x	y
2	6
3	8
4	10
1	5
5	10

1) Draw Scatter plot



Clear all lists, $x \rightarrow L1$, $y \rightarrow L2$

STAT **→** **CALC**

8: LinReg(a+bx)

$$a = 3.6$$

$$b = 1.4$$

$$r^2 = .942$$

$$r = .971$$

with Menu

xlist: L1

ylist: L2

clear

Calculate

No Menu

L1, L2

Enter

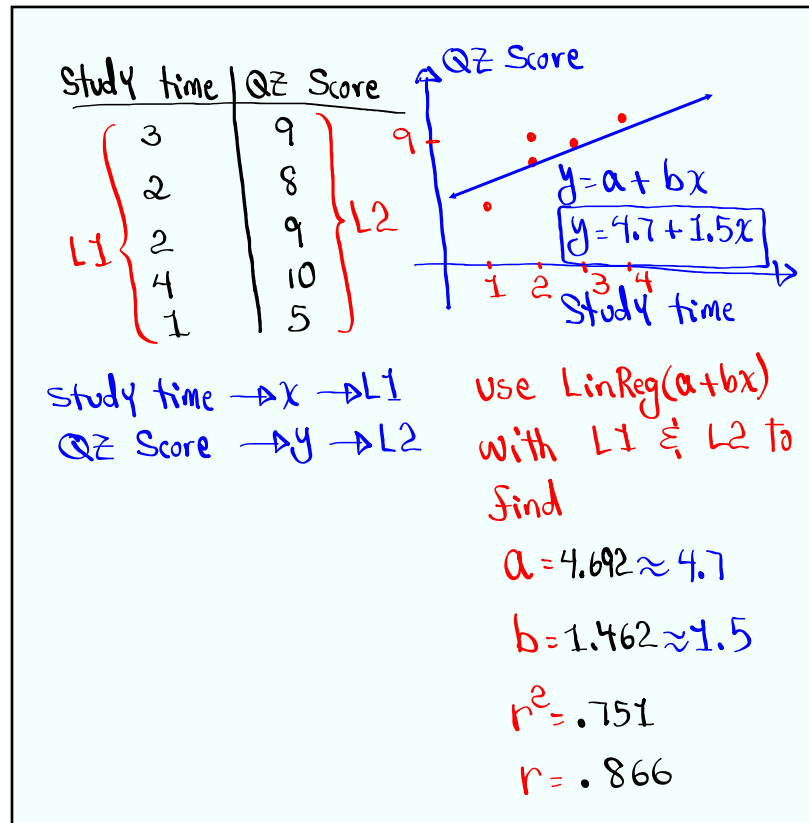
If r & r^2 missing:

end **0** **↓** **...** **→** **Diagnostic On**

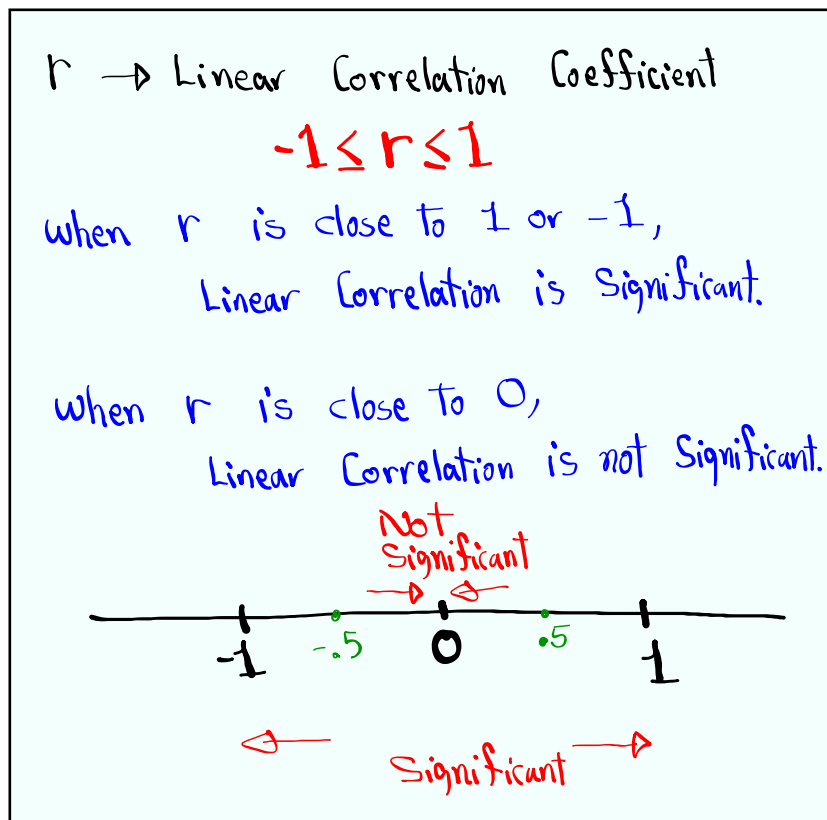
Enter

Enter

Sep 24-12:05 PM



Sep 24-12:19 PM



Sep 24-12:26 PM

r^2 (Always round to whole %)

Coefficient of determination

r^2 tells what % of Y-Values are explained by X-Values

From Last example

$$r^2 = .751 \rightarrow r^2 \approx 75\%$$

75% of QZ Scores are explained by Study times.

25% are unexplained.

Sep 24-12:31 PM