

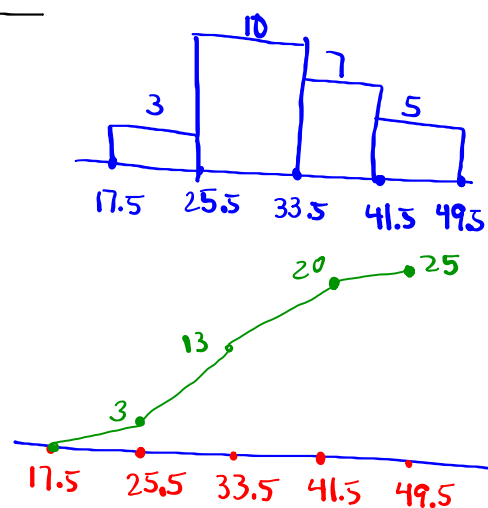
Math 110
Winter 2021
Lecture 5



Class QZ 2

class	BNDRS	Class F	Cum. F
17.5 - 25.5		3	3
25.5 - 33.5		10	13
33.5 - 41.5		7	20
41.5 - 49.5		5	25

Draw
 Histogram & ogive



Consider the chart below

Class limits	Class MP	Class F	Rel. F	% F
54 - 60	57	4	.08	8%
61 - 67	64	10	.20	20%
68 - 74	71	16	.32	32%
75 - 81	78	14	.28	28%
82 - 88	85	6	.12	12%

1) # classes
5

2) Class width
CW=7

3) Complete the table

4) Sample Size $n=50$

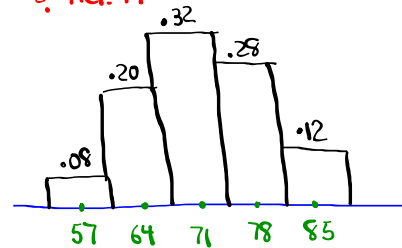
5) Draw histogram using class MP
∴ Rel. F.

6) Find \bar{x} & S .

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

□

$\bar{x} = 72.12$

Find S^2 in reduced fraction

$S = S_x = 7.920$

VAR S: 5: 3: S_x x^2 Enter

$n = 50$

MATH 1: Enter 1568 / 25

Round \bar{x} & S to a whole #, then find 68% Range and usual range.

$\bar{x} = 72$

$S = 8$

68% Range $\Rightarrow \bar{x} \pm S \Rightarrow 64$ to 80

Usual Range $\Rightarrow \bar{x} \pm 2S \Rightarrow 56$ to 88

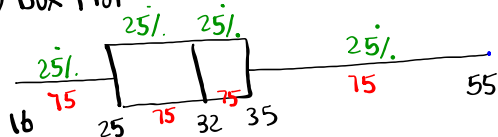
95% Range

2.5% Usual Range 2.5%
56 95% Range 88

Empirical Rule

300 students were randomly selected. The 5-Number Summary of their ages were 16, 25, 32, 35, and 55.

1) Box Plot



Min. = 16
 $Q_1 = 25$
 Med. = 32
 $Q_3 = 35$
 Max = 55

$300 \div 4 = 75$

$IQR = Q_3 - Q_1 = 35 - 25 = 10$

Upper Fence = $Q_3 + 1.5(IQR) = 35 + 1.5(10) = 50$

Lower Fence = $Q_1 - 1.5(IQR) = 25 - 1.5(10) = 10$

Outliers: More than 50 or less than 10
 above UF Below LF
 50 to 55 None

32 exam Scores are given below:

85 66 90 100 58 70
 95 88 80 93 72 65
 40 99 82 80 77 69
 93 95 84 82 79 65
 90 80 70 60 100 54
 74 84

- 1) clear all lists
- 2) Store this sample in L1
- 3) then Sort L1.

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

4) Let's view L1, then make Stem Plot

Clear the Screen

[2nd] [1] Enter
 L1

{ 40 54 58
 ← ← ← → → →

```

4 | 0
5 | 48
6 | 05569
7 | 002479
8 | 000224458
9 | 0033559
10| 00
    
```

4	0	$Range = 100 - 40 = 60$ $Midrange = \frac{100 + 40}{2} = 70$ $Mode: 80$ $Estimate S \approx \frac{Range}{4} = \frac{60}{4} = 15$
5	48	
6	05569	
7	002479	
8	000224458	
9	0033559	
10	00	

Find \bar{x} & S

$\bar{x} = 78.72$ $Min = 40$

$S = 14.438$ $Q_1 = 69.5$

$n = 32$ $Med = 80$

↓

↓

↓

Find S^2 in reduced fraction

VARs | 5: | 3:

χ^2 | Math | 1: | Enter

$S^2 = \frac{206799}{992}$

4	0	$Find P_{10}$ $L = \frac{10}{100} \cdot 32 = 3.2$ $L = 4$ $P_{10} = 4^{th} \text{ element}$ $P_{10} = 60$
5	48	
6	05569	
7	002479	
8	000224458	
9	0033559	
10	00	

2^{nd} | 1 | (16 | enter

2^{nd} | 1 | (17 | enter

$Find P_{50}$

$L = \frac{50}{100} \cdot 32 = 16$ $P_{50} = \frac{16^{th} \text{ element} + 17^{th}}{2}$

$= \frac{80 + 80}{2} = 80$

Ch. 3 ✓
Siz 5-9 ✓

Find K such that $P_K = 90$

Round to a whole!

$PR = K = \frac{B}{n} \cdot 100$

$= \frac{23}{32} \cdot 100 = 71.875 \Rightarrow K = 72$

$P_{72} = 90$

72% 90 28% about 72% below 90 and 28% above 90

Consider the chart below:

x	y
2	5
3	7
3	8
4	10
5	9

Clear all lists
Reset all lists
x → L1 ; y → L2

STAT → CALC
8: Lin Reg(a+bx)

$y = a + bx$
a = 2.962
b = 1.423
 $r^2 = .712$
r = .844

2nd 10
↓ ↓ ↓ ... ↓
DiagnosticOn
Enter
Enter

With Menu
xlist: L1
ylist: L2
clear
Calculate

No Menu
L1, L2 enter
□

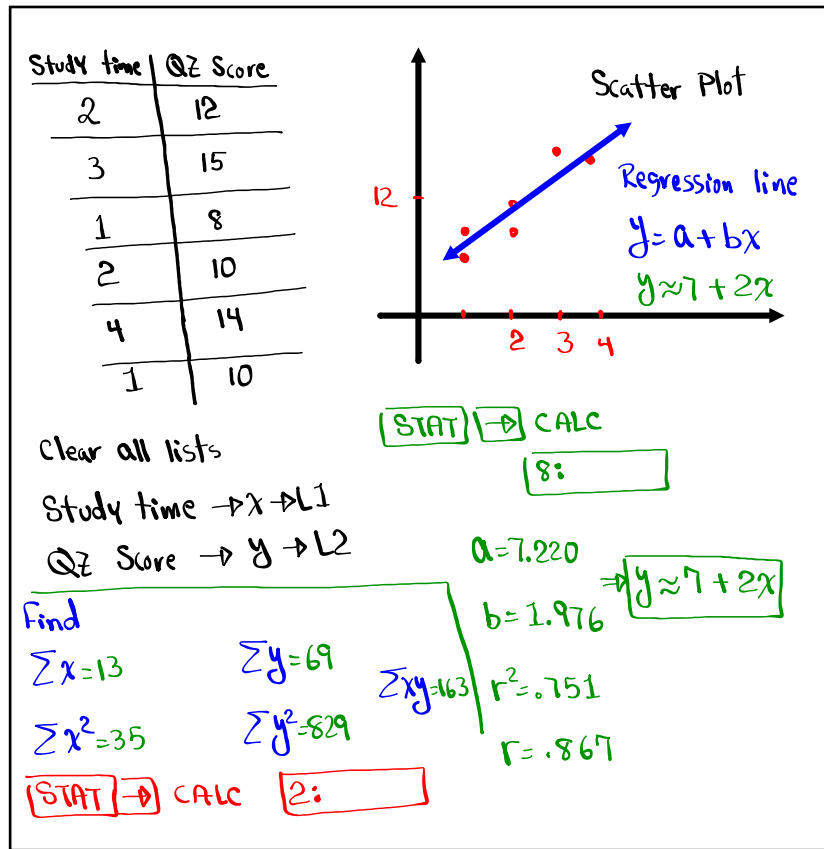
$y = 2.96 + 1.42x$
 $y \approx 3 + 1.4x$

STAT → CALC
2:

n = 5
 $\sum x = 17$
 $\sum x^2 = 63$
 $\sum y = 39$
 $\sum y^2 = 319$
 $\sum xy = 140$

With Menu
xlist: L1
ylist: L2
Freq List: clear
Calculate

No Menu
L1, L2 enter
□



Regression line $y = a + bx$

$$a = \frac{\sum y \sum x^2 - \sum x \sum xy}{n \sum x^2 - (\sum x)^2} = \frac{69 \cdot 35 - 13 \cdot 163}{6 \cdot 35 - 13^2} = \frac{296}{41}$$

$$a \approx 7.220$$

$$b = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2} = \frac{6 \cdot 163 - 13 \cdot 69}{6 \cdot 35 - 13^2} = \frac{81}{41}$$

$$b \approx 1.976$$

Consider the chart below

x	y	x^2	y^2	xy
2	5	4	25	25=10
3	8	9	64	3*8=24
1	4	1	16	4
5	10	25	100	50

$x \rightarrow L1, y \rightarrow L2$

$$n=4$$

$$\sum x = 11$$

$$\sum x^2 = 39$$

$$\sum y = 27$$

$$\sum y^2 = 205$$

$$\sum xy = 88$$

$$a = \frac{\sum y \sum x^2 - \sum x \sum xy}{n \sum x^2 - (\sum x)^2}$$

$$= \frac{27 \cdot 39 - 11 \cdot 88}{4 \cdot 39 - 11^2} = \frac{85}{35} = \boxed{2.429}$$

Regression line

$$y = a + bx \Rightarrow \boxed{y = 2.429 + 1.571x}$$

$$b = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

$$= \frac{4 \cdot 88 - 11 \cdot 27}{4 \cdot 39 - 11^2} = \frac{55}{35}$$

$$\boxed{b \approx 1.571}$$

Class QZ 3

Consider the Sample below

18 12 20 10

15 10 18 25

16 19 20 15

Find

1) \bar{x}

2) s

3) s^2 in reduced fraction

} 3-decimals