

Statistics
Lecture 4

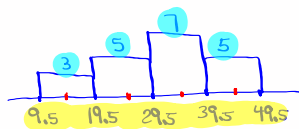


Feb 19-8:47 AM

Class QZ 3

use the chart below to draw histogram

class ends	Class f
9.5-19.5	3
19.5-29.5	5
29.5-39.5	7
39.5-49.5	5



4 classes, $CW = 19.5 - 9.5 = 10$ } Sample Size
 $29.5 - 19.5 = 10$ } $n = \sum f$
 $39.5 - 29.5 = 10$ } $= 3 + 5 + 7 + 5 = 20$

Oct 25-9:41 AM

Complete the chart below:

class BNDRS	class MP	Class F	Cum.F	Rel.F	% F
17.5 - 29.5	23.5	8	8	.267	26.7%
29.5 - 41.5	35.5	15	23	.500	50.0%
41.5 - 53.5	47.5	7	30	.233	23.3%

$\text{Class MP} = \frac{\text{+ class BNDRS}}{2}$, $\text{CW} = 29.5 - 17.5 = 12$ $n=30$
 $\text{Rel. F} = \frac{f}{n} = \frac{f}{30}$

Draw Ogive

- class BNDRS
- Cum. F

Freq. Polygon

- class MP
- Extra MP on each side
- class F

Oct 26-7:26 AM

Consider the Sample below

25 32 18 20 40
35 24 19 42 25

$n = 10$

Min. = 18, Max = 42

Range = Max - Min = 24

Midrange = $\frac{\text{max} + \text{Min}}{2} = 30$

Mode: 25

Find class width if we wish to make freq. table with

a) 4 classes
 class width = $\frac{\text{Range}}{4} = \frac{24}{4} = 6$
CW = 7

b) 5 classes
 class width = $\frac{\text{Range}}{5} = \frac{24}{5} = 4.8$
CW = 5

Oct 26-7:39 AM

25 32 18 20 40
35 24 19 42 25 → L1

1) Clear all lists.
 [2nd] [+] [4: ClearAllLists] [Enter]

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

3) Store this Sample in a list.
 [STAT] [Edit] [1: Edit]

4) Now Let's quit and clear screen.
 [2nd] [MODE] [Clear]

L1	
25	Enter
32	"
18	"
⋮	"
25	"

Oct 26-7:47 AM

To view L1:
 [2nd] [1] [Enter]

{ 25 32 18 25 }

→ → →
 ← ← ←

How to Sort a list:
 [STAT] [Edit] [2nd] [1] [Enter]
 [2: SortA] L1

Now let's view L1 again:
 [2nd] [1] [Enter]

{ 18 19 20 24 42 }

→ → →
 ← ← ←

We are ready to make STEM Plot

1	8 9
2	0 4 5 5
3	2 5
4	0 2

Oct 26-7:56 AM

Use your calc to find

$\sum x = 280$ $\sum x^2 = 8524$ $n = 10$

STAT → CALC
 1: 1-Var Stats
 Clear
 List: L1
 FreqList: Blank
 Calculate
 end 1

No Menu
 1-Var Stats
 1:1
 Enter
 end 1

find $\frac{\sum x}{n} = \frac{280}{10} = 28$

find $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{10 \cdot 8524 - 28^2}{10(10-1)} = \frac{84456}{90} = 938.4$

Now let's take square root of last answer.

end x^2 end (-) Enter
 30.633 → whole # 31
 → 1-decimal 30.6

To convert to reduced fraction
 (Math) 1: → frac
 4692 / 5 Enter

Oct 26-8:06 AM

n → Sample Size
 x → Data element
 $\sum x$ → Sum of data elements

\bar{x} → x -bar, Sample Mean (Average)

Ex: Consider the Sample 2, 6, 10, 10, 13

1) $n = 5$ 2) $\sum x = 41$ 3) $\bar{x} = \frac{\sum x}{n} = \frac{41}{5} = 8.2$

$\bar{x} = \frac{\sum x}{n}$

Oct 26-9:05 AM

Consider the Sample below

3 5 5 5 6
8 8 8 9 12

1) $n = 10$ 2) Range = $12 - 3 = 9$ 3) Midrange = $\frac{12+3}{2} = 7.5$

4) Mode = $5 \frac{1}{2} 8$ 5) $\sum x = 69$ 6) $\bar{x} = \frac{\sum x}{n} = \frac{69}{10} = 6.9$

Oct 26-9:10 AM

$n \rightarrow$ Sample Size
 $x \rightarrow$ Data element
 $\sum x \rightarrow$ Sum of data elements
 $\sum x^2 \rightarrow$ Sum of data elements²
 $S^2 \rightarrow$ Sample Variance

$$S^2 = \frac{\sum (x - \bar{x})^2}{n - 1}$$

$$S^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n - 1)}$$

Consider the Sample below

1, 3, 3, 3, 7

$n = 5$ $\sum x = 17$ $\sum x^2 = 77$

$$S^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n - 1)} = \frac{5 \cdot 77 - 17^2}{5(5 - 1)}$$

$$= \frac{96}{20} = 4.8$$

[MATH] 1: \rightarrow $\frac{96}{20}$ [Enter]

$\frac{24}{5}$

Oct 26-9:14 AM

Consider the Sample below

2	3	5	5	6
8	8	9	10	12

1) $n = 10$ 2) Range = $12 - 2 = 10$ 3) Midrange = $\frac{12+2}{2} = 7$
 4) Mode = $5 \text{ \& } 8$

Store in L1
 Clear all lists
 [2nd] [+] [4]: Clear All lists
 [Enter]
 [STAT] Edit L1 |
 [1:Edit] 2 |
 3 |
 5 |
 ⋮ |
 12 |

Now
 [STAT] [→] CALC
 [1:1-Var Stats] Use L1

$\sum x = 68$ $\sum x^2 = 552$ $n = 10$

Oct 26-9:23 AM

$\sum x = 68$ $\sum x^2 = 552$ $n = 10$
 $\bar{x} = \frac{\sum x}{n} = \frac{68}{10} = 6.8$
 $s^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{10 \cdot 552 - 68^2}{10(10-1)} = \frac{896}{90} = 9.95$
 $896 \div 90$ [MATH] [1:→)Snc] [Enter] $\frac{448}{45}$

Now take Square root of last answer

[end] [x^2] [end] [(-)] [Enter] ≈ 3.155
 whole 3
 1-dec. 3.2
 2-dec. 3.16

Oct 26-9:31 AM

\bar{x} → Sample Mean
 s^2 → Sample Variance
 s → Sample standard deviation

$$s = \sqrt{s^2}$$

$n=4, \sum x=20, \sum x^2=100$

$$\bar{x} = \frac{\sum x}{n} = \frac{20}{4} = \boxed{5}$$

$$s^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{4 \cdot 100 - 20^2}{4(4-1)}$$

$$= \frac{0}{12} = \boxed{0}$$

$$s = \sqrt{s^2} = \sqrt{0} = \boxed{0}$$

Oct 26-9:38 AM

Class QZ 4

Consider the Sample below

5	6	8	8	1) mode = $\boxed{10}$
10	10	10	12	2) $\sum x = \boxed{69}$
				3) $\sum x^2 = \boxed{633}$
				4) $n = \boxed{8}$

Oct 26-9:43 AM