

# Statistics

## Lecture 6



Feb 19-8:47 AM

$x \rightarrow$  Data elements

Slk 5-8

$\sum x \rightarrow$  Sum of data elements

$\bar{x} \rightarrow$   $x$ -bar  $\rightarrow$  Sample Mean (Average)

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

$n \rightarrow$  Sample Size

Ex: Consider the Sample below

2, 3, 3, 5, 7

$$n = 5$$

$$\sum x = 2 + 3 + 3 + 5 + 7 = 20$$

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

Sep 4-8:47 AM

Consider the Sample below

1, 3, 3, 7, 7, 8, 9, 11

1)  $n = 8$

2) Range =  $11 - 1 = 10$

3) Midrange =  $\frac{11+1}{2} = 6$

4) Mode =  $3 \text{ \& } 7$

5)  $\sum x = 1 + 3 + 3 + 7 + 7 + 8 + 9 + 11$   
 $= \boxed{49}$

6)  $\bar{x} = \frac{\sum x}{n} = \frac{49}{8} = 6.125$

Round to

Whole 6

1-dec. 6.1

2-dec. 6.13

Sep 4-8:51 AM

Consider the Sample below

2 4 6 8 10

12 14 16 18 20

1)  $n = 10$

2) Range =  $20 - 2 = 18$

3) Midrange =  $\frac{20+2}{2} = 11$

4) Mode None

5) Find class width for 3 classes.

$\frac{\text{Range}}{3} = \frac{18}{3} = 6$  CW=7

6) Find class width for 4 classes

$\frac{\text{Range}}{4} = \frac{18}{4} = 4.5$  CW=5

7)  $\sum x = 2 + 4 + 6 + \dots + 20$   
 $= \boxed{110}$

8)  $\bar{x} = \frac{\sum x}{n} = \frac{110}{10}$   
 $= \boxed{11}$

Sep 4-8:57 AM

$x \rightarrow$  Data elements

$n \rightarrow$  Sample Size

$\sum x \rightarrow$  Sum of data elements

$\sum x^2 \rightarrow$  Square each data element, then add

$S^2 \rightarrow$  Sample Variance

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

Sep 4-9:07 AM

Consider the Sample below

1 3 3 3 5

1)  $n = 5$

2) Range = 4

3) Midrange = 3

4) Mode = 3

5)  $\sum x = 1 + 3 + 3 + 3 + 5 = 15$

6)  $\sum x^2 = 1^2 + 3^2 + 3^2 + 3^2 + 5^2 = 53$

7)  $\bar{x} = \frac{\sum x}{n} = \frac{15}{5} = 3$

8)  $S^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{5 \cdot 53 - 15^2}{5(5-1)}$

$= \frac{40}{20} = 2$

Sep 4-9:10 AM

Consider the Sample below

$$1 \quad 3 \quad 3 \quad 3 \quad 1) n = \boxed{8}$$

$$5 \quad 5 \quad 5 \quad 7$$

$$2) \sum x = 1 + 3 + 3 + 3 + 5 + 5 + 5 + 7 = \boxed{32}$$

$$3) \sum x^2 = 1^2 + 3^2 + 3^2 + 3^2 + 5^2 + 5^2 + 5^2 + 7^2 = \boxed{152}$$

$$4) \bar{x} = \frac{\sum x}{n} = \frac{32}{8} = \boxed{4}$$

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

$$= \frac{8 \cdot 152 - 32^2}{8(8-1)}$$

$$= \frac{192}{56} \approx \boxed{3.429}$$

Sep 4-9:18 AM

$x \rightarrow$  Data element

$n \rightarrow$  Sample Size

$\bar{x} \rightarrow$   $x$ -bar  $\rightarrow$  Sample Mean

$S^2 \rightarrow$  Sample Variance

$S \rightarrow$  Sample Standard  
Deviation

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

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

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

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

Sep 4-9:24 AM