

Statistics

Lecture 6



Feb 19-8:47 AM

Ages of 16 randomly selected voters are given below

35 42 25 60
63 50 52 55
68 70 38 28
32 38 27 45

1) $n = 16$

2) Mode 38

Store in L1

Sort L1

view L1

Make Stem Plot

Use 1-Var Stats with L1

only to find

Min = 25

 $Q_1 = 33.5$

Med = 43.5

 $Q_3 = 57.5$

Max = 70

2 | 5 7 8
3 | 2 5 8 8
4 | 2 5
5 | 0 2 5
6 | 0 3 8
7 | 0

$$S^2 = \frac{3262}{15}$$

$$\begin{aligned} \bar{x} &= 45.5 \\ S &= Sx = 47.47 \\ n &= 16 \end{aligned}$$

↓

Sep 22-10:42 AM

Min = 25

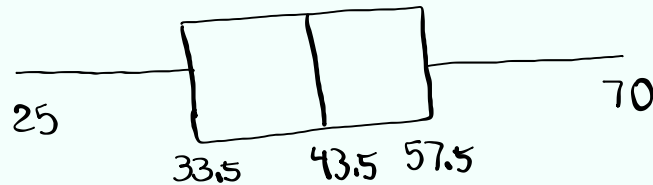
$Q_1 = 33.5$

Med = 43.5

$Q_3 = 57.5$

Max = 70

Draw Box Plot



$IQR = Q_3 - Q_1 = 57.5 - 33.5 = 24$

Upper Fence = $Q_3 + 1.5(IQR) = 57.5 + 1.5(24) = 93.5$

Lower Fence = $Q_1 - 1.5(IQR) = 33.5 - 1.5(24) = -2.5$

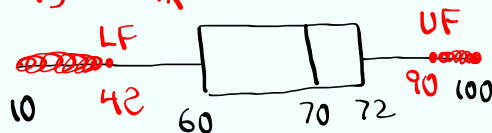
Any outliers $\rightarrow$ None

Sep 22-10:56 AM

A data set has the following 5-Number Summary:

10	60	70	72	100
Min	Q_1	Med.	Q_3	Max

1) Draw Box Plot.



2) $IQR = 72 - 60 = 12$

3) Discuss outliers $10 - 42$ & $90 - 100$

Upper Fence = $Q_3 + 1.5(IQR) = 72 + 1.5(12) = 90$

Lower Fence = $Q_1 - 1.5(IQR) = 60 - 1.5(12) = 42$

Sep 22-11:01 AM

Consider the Stem Plot below

```

1 | 0 3 8
2 | 0 4 5 8 8
3 | 2 3 6 6 6 9 9
4 | 0 2 5 5 5 7 8 8 9
5 | 0 2 3 7 8 9
6 | 0 0

```

$$1) n = 32$$

$$2) \text{Range} = 60 - 10 = 50$$

$$3) \text{Midrange} = \frac{60 + 10}{2} = 35$$

$$4) \text{Mode} = 36 \text{ \& } 45$$

$$5) \text{Estimate } S \approx \frac{\text{Range}}{4} = \frac{50}{4} \approx 12.5$$

Clear all lists.

Store this data in L1

Find $\bar{x}$ & S .

$$\bar{x} = 39.84375 \approx 40$$

$$S = 13.875 \approx 14$$

$$\text{Min} = 10$$

$$n = 32$$

$$Q_1 = 30$$

Q

$$\text{Med.} = 41$$

Q

$$Q_3 = 49.5$$

$$\text{Max} = 60$$

$$S^2 = \frac{190983}{992}$$

Sep 22-11:09 AM

```

1 | 0 3 8
2 | 0 4 5 8 8
3 | 2 3 6 6 6 9 9
4 | 0 2 5 5 5 7 8 8 9
5 | 0 2 3 7 8 9
6 | 0 0

```

Find P_{20}

$$L = \frac{20}{100} \cdot 32 = 6.4 \rightarrow L = 7$$

$$P_{20} = 7\text{th element} = 28$$

Median

$$\begin{array}{c} 20\% \quad \quad 80\% \\ \hline P_{20} = 28 \end{array}$$

Find P_{50}

$$L = \frac{50}{100} \cdot 32 = 16$$

$$P_{50} = \frac{16\text{th element} + 17\text{th element}}{2} = \frac{40 + 42}{2} = 41$$

50%

50%

$$P_{50} = 41$$

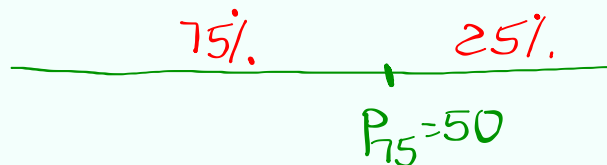
Median

Sep 22-11:23 AM

1 | 038
 2 | 04588
 3 | 2366699
 4 | 025557889
 5 | 023789
 6 | 00

find K such that

$P_K = 50$
 Below $\uparrow$
 $K = \frac{B}{n} \cdot 100 = \frac{24}{32} \cdot 100$
 $= 75$



Sep 22-11:28 AM

A data Set has $\bar{x} = 92$ and $S = 8$.

1) Find Z -Score for data element 110.

Usual or unusual? explain $\rightarrow Z > 2$

$$Z = \frac{x - \bar{x}}{S} = \frac{110 - 92}{8} = \frac{18}{8} = 2.25$$

2) Find data element with Z -Score -1.5 .

Usual or unusual? explain $\rightarrow -2 \leq Z \leq 2$

$$Z = \frac{x - \bar{x}}{S} \quad -1.5 = \frac{x - 92}{8}$$

Cross-multiply

$$x - 92 = 8(-1.5)$$

$$x = 92 - 12 = 80$$

Sep 22-11:31 AM

Class QZ 1

Consider the Sample below

12 15 8 20 25

10 18 13 16 24

1) Mode = None

2) $\bar{x} = 16.4 \approx \boxed{16}$ } Round to3) $S = 5.685 \approx \boxed{6}$ } whole #4) $S^2 = \frac{2909}{90}$ } Reduced Fraction

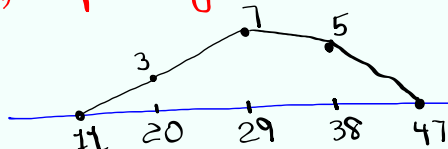
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Complete the chart below

class limits	class MP	class F
16 - 24	20	3
25 - 33	29	7
34 - 42	38	5

1) How many classes? $\boxed{3}$ 2) class width $\boxed{9}$ 3) Sample Size $n = 3 + 7 + 5 = \boxed{15}$

4) Freq. Polygon

class MP $\rightarrow$ L1class F $\rightarrow$ L2

$$\bar{x} = 30.2 = 30$$

$$S = 6.689 = 7$$

$$n = 15$$

$$S^2 = \frac{1566}{35}$$

} whole #

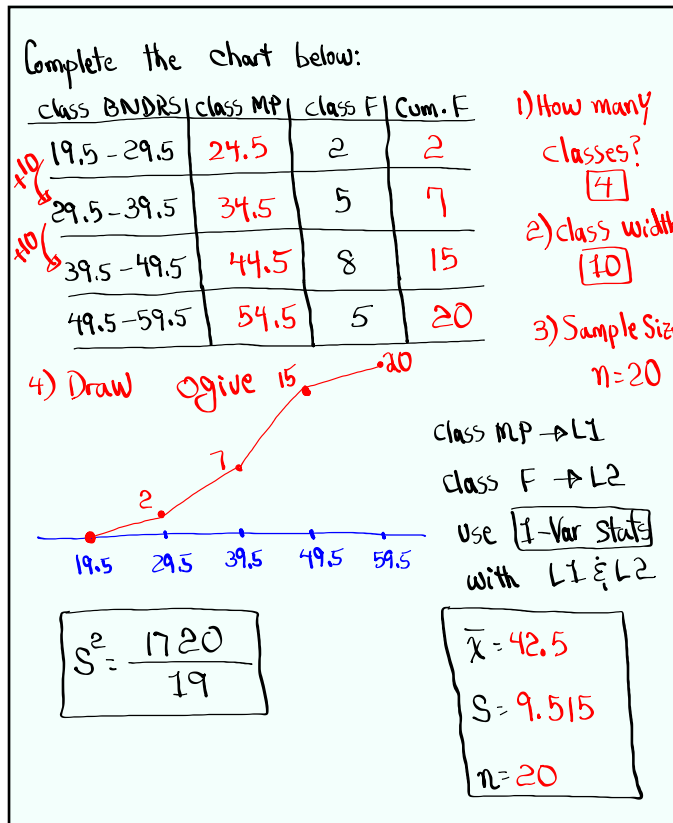
 $\boxed{\text{STAT}} \rightarrow \boxed{\text{CALC}}$ $\boxed{1:1\text{-Var Stats}}$

List: L1

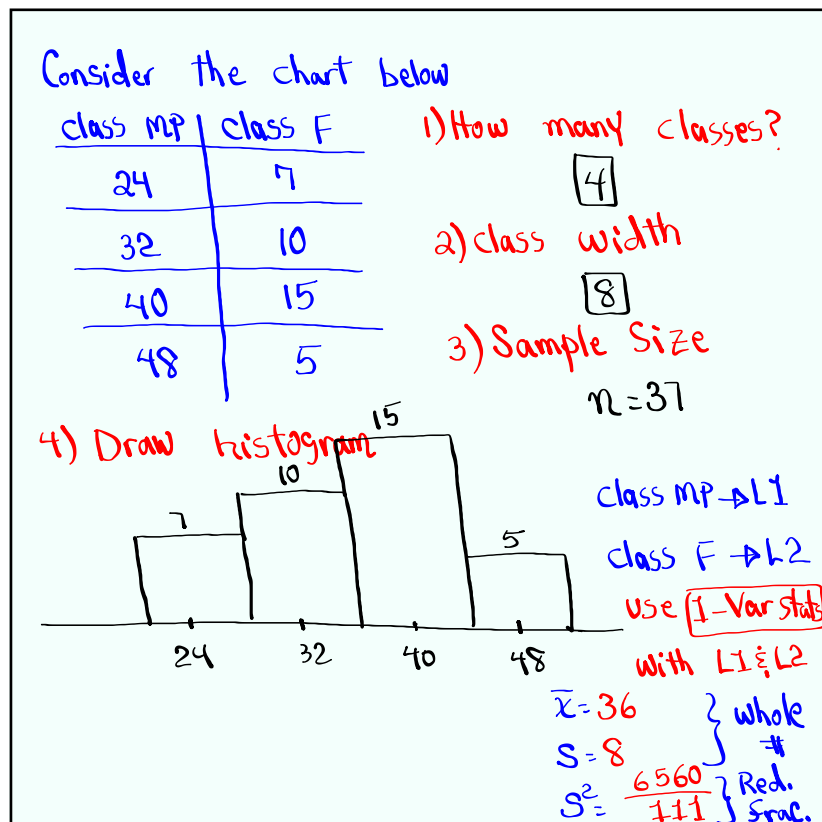
FreqList: L2

 $\boxed{\text{VARS}}$ $\boxed{5: \text{Statistics}}$ $\boxed{3: Sx}$ $\boxed{x^2}$ $\boxed{\text{Math}}$ $\boxed{1: \rightarrow \text{Frac}}$ $\boxed{\text{Enter}}$ $\boxed{\text{Calculate}}$

Sep 22-12:00 PM



Sep 22-12:11 PM



Sep 22-12:23 PM