

Statistics

Lecture 2



Feb 19-8:47 AM

Making Freq. table and do Some graphs

SG 3

SG 4

How to make a Freq. table:

1) Range = Max. - Min.

2) class width = $\frac{\text{Range}}{\# \text{ of classes}}$

If decimal $\Rightarrow$ Round-up to a whole #

If whole $\Rightarrow$ Add 1

ex: A Sample has min.=30 and max.=70

Find class width if we wish to have

a) 3 classes

Range = 70-30
= 40

b) 4 classes

$$CW = \frac{\text{Range}}{3} = \frac{40}{3} = 13.\bar{3}$$

$$[CW = 14]$$

Decimal

$$CW = \frac{\text{Range}}{4} = \frac{40}{4} = 10$$

$$[CW = 11]$$

whole

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class limits	class BNDRS	class MP	class F	Cum. F	Rel. F	% F

I randomly Selected 20 Students and here are their ages:

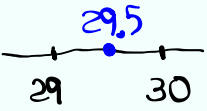
18 19 20 20 24
25 25 28 30 30
30 32 35 36 38
40 42 45 50 52

1) Sample Size $n=20$
 2) $Min=18$, $Max=52$
 3) $Range = Max - Min = 52 - 18 = 34$
 4) $Midrange = \frac{Max + Min}{2} = \frac{52 + 18}{2} = \frac{70}{2} = 35$
 5) Mode 30
 6) Find class width if we wish to have 3 classes.

$CW = \frac{Range}{3} = \frac{34}{3} = 11.3$ ← Decimal CW = 12

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class limits	class BNDRS	class MP	class F	Cum. F	Rel. F	% F
18 - 29	17.5 - 29.5	23.5	8	8	.40	40%
30 - 41	29.5 - 41.5	35.5	8	16	.40	40%
42 - 53	41.5 - 53.5	47.5	4	20	.20	20%


 $class MP = \frac{+class limits}{2}$
 $Rel. F = \frac{f}{n} = \frac{f}{20}$

we draw

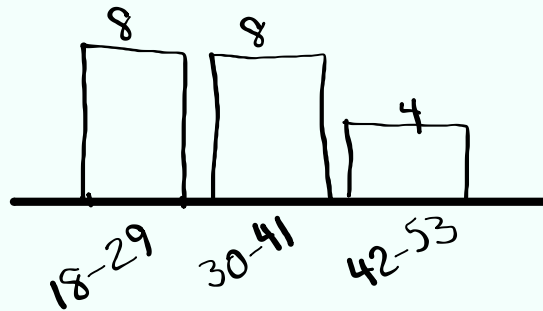
Bar chart Histogram Ogive

Freq. Polygon Pie chart

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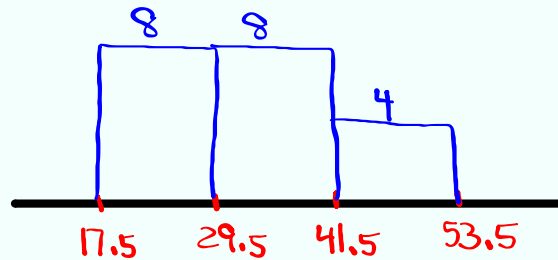
Bar chart

- class limits
- class F



Histogram

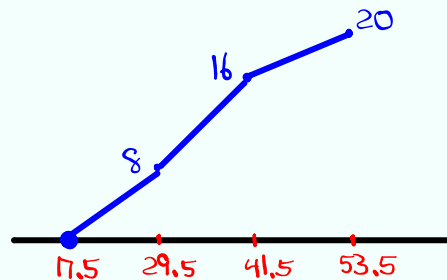
- class BNDRS
- class F



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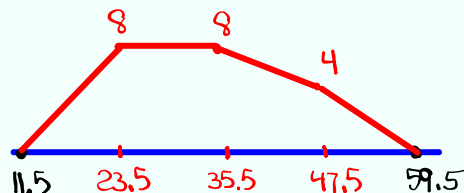
Ogive

- class BNDRS
- Cum. F
- Start at 0 level
- non-decreasing



Freq. Polygon

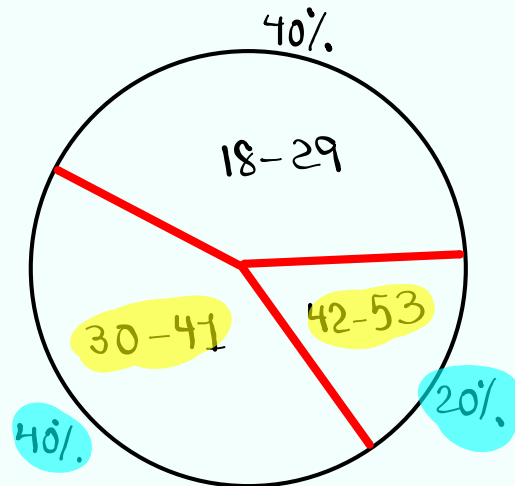
- class MP
- class F
- one extra MP on each side
- Start & finish @ 0 level



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Pie Chart

- Circle
- class limits to name each slice
- % to Scale each slice



what % of students were at least 30 yrs old?

$$40\% + 20\% = 60\%$$

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I randomly selected 25 exams, here are the Scores:

52 58 59 60 64

$$1) n = 25$$

68 68 70 73 75

$$2) \text{Range} = 100 - 52 = 48$$

75 75 78 80 83

$$3) \text{Midrange} = \frac{100 + 52}{2} = 76$$

85 85 85 88 89

90 93 98 100 100

$$4) \text{Mode } 75 \text{ \& } 85$$

Bimodal

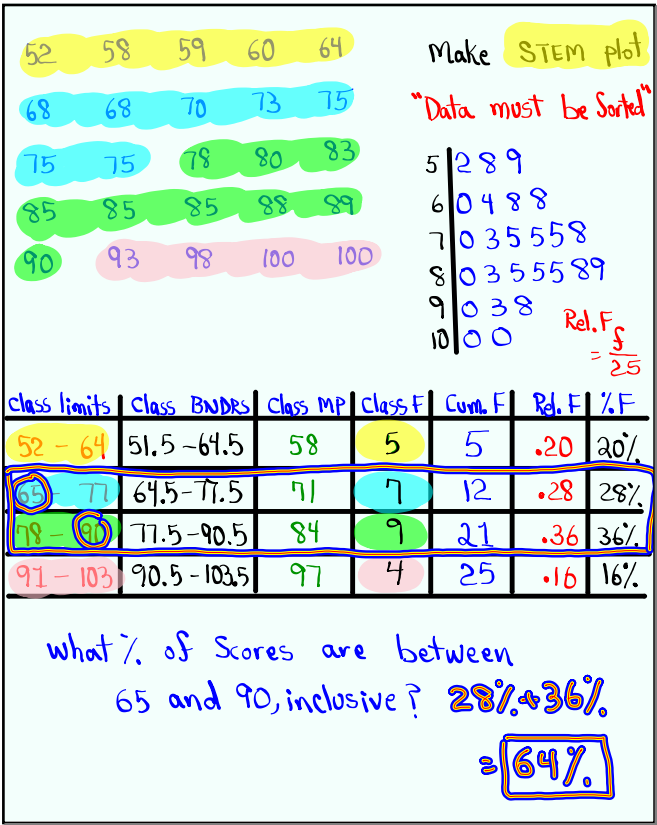
5) Find class width if we wish to have 4 classes.

$$CW = \frac{\text{Range}}{4} = \frac{48}{4} = 12$$

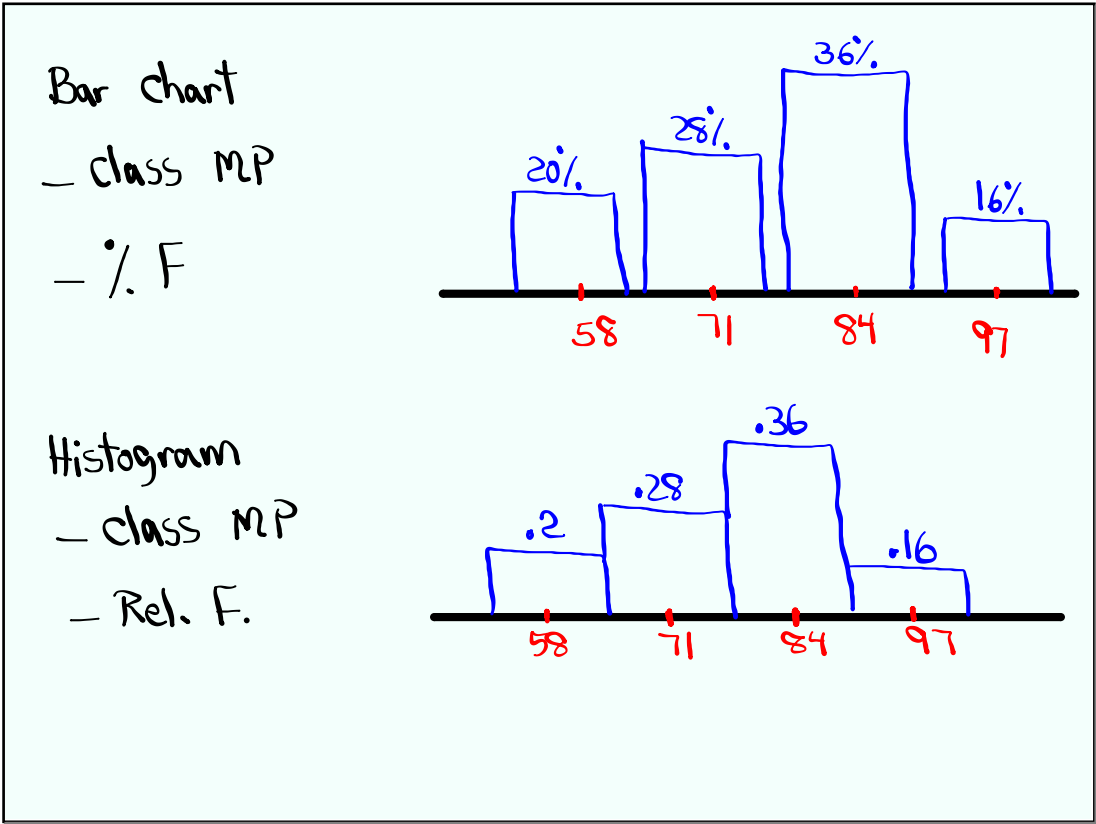
whole #

$$CW = 13$$

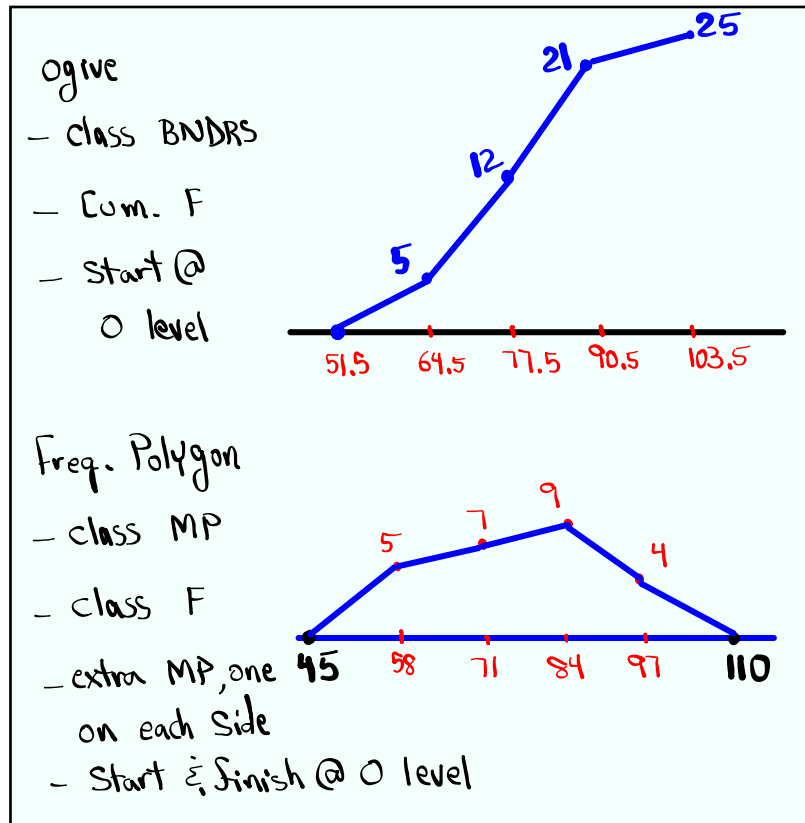
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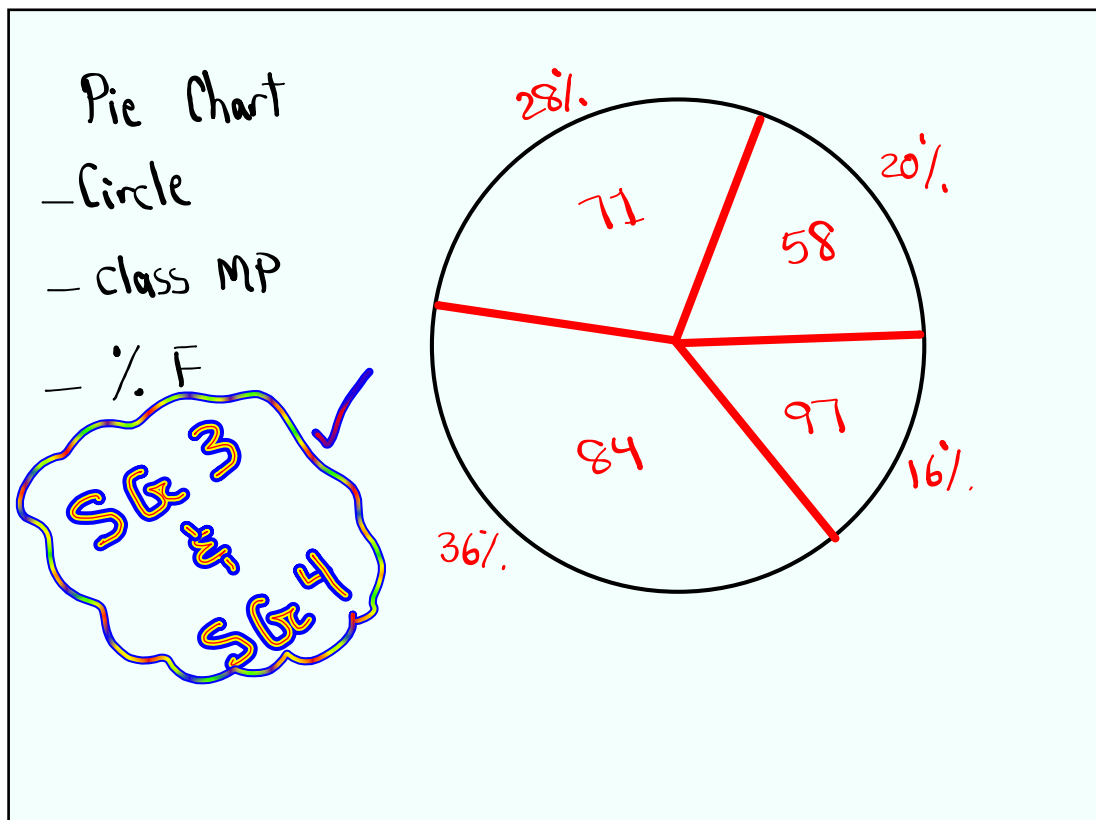
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Consider the Sample below

1 3 3 3 5

1) $n = 5$

2) $\text{Range} = 5 - 1 = 4$

3) $\text{Midrange} = \frac{5+1}{2} = 3$

4) $\text{Mode} = 3$

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

$\uparrow$ Summation $\nwarrow$ data element

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

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

8) $\frac{n \cdot \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{5 \cdot 53 - 15^2}{5(5-1)} = \frac{40}{20} = 2$

9) $\sqrt{\text{Last Answer}} = \sqrt{2} \approx 1.414$

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