Statistics

Lecture 3

Feb 19-8:47 AM

Consider the Sample below

0 2 2 2 6 6 6 10

1) Sample Size $n = 8$

2) Range: Max − Min = 10 − 0 = 10

3) Midrange = $\frac{\text{Max} + \text{Min}}{2} = \frac{10+0}{2} = 5$

4) Mode = 2 & 6 Bimodal

5) $\Sigma x = 0 + 2 + 2 + 2 + 6 + 6 + 6 + 10 = \boxed{34}$

6) $\Sigma x^2 = 0^2 + 2^2 + 2^2 + 2^2 + 6^2 + 6^2 + 6^2 + 10^2 = \boxed{220}$

7) Divide range by 3, if decimal → Round up

$\frac{\text{Range}}{3} = \frac{10}{3} = 3.\overline{3}$ → 4 if whole → +1

8) Divide range by 5, if decimal → Round up

$\frac{\text{Range}}{5} = \frac{10}{5} = 2$ → 3 if whole → +1

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9) Compute $\frac{\sum x}{n} = \frac{34}{8} = \boxed{4.25}$ → whole 4
→ 1-decimal 4.3

10) Compute $\frac{n\sum x^2 - (\sum x)^2}{n(n-1)}$

$= \frac{8 \cdot 220 - 34^2}{8(8-1)} = \frac{604}{56} \approx 10.786$

11) $\sqrt{\text{last answer}} = \sqrt{10.786} \approx \boxed{3.284}$

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I randomly selected 20 exams, here are the Scores

58 60 65 65 70
72 75 75 75 78
80 83 86 86 89
90 92 98 100 100

1) Sample Size $\boxed{n=20}$

2) Range $= 100 - 58 = \boxed{42}$

3) Midrange $= \frac{100+58}{2} = \boxed{79}$

4) Mode $\boxed{75}$

5) $\frac{\text{Range}}{3}$ if decimal → Round-up
whole → Add 1

$\frac{42}{3} = 14$ (15) class width for a freq. table with 3 classes.

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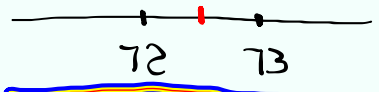
Class limits	Class BNDRS	Class MP	Class F	Cum. F	Rel. F	%F
58 – 72	57.5 – 72.5	65	6	6	.30	30%
73 – 87	72.5 – 87.5	80	8	14	.40	40%
88 – 102	87.5 – 102.5	95	6	20	.30	30%



$$\text{Class MP} = \frac{\text{+class limits}}{2}$$

$$\text{Rel. F} = \frac{f}{n}$$

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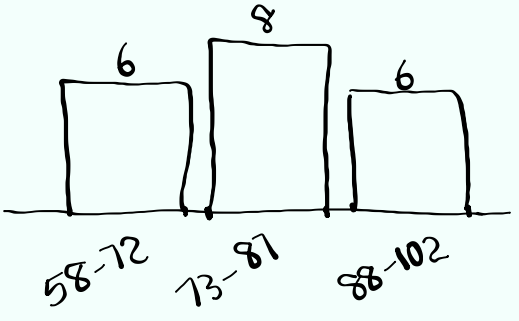
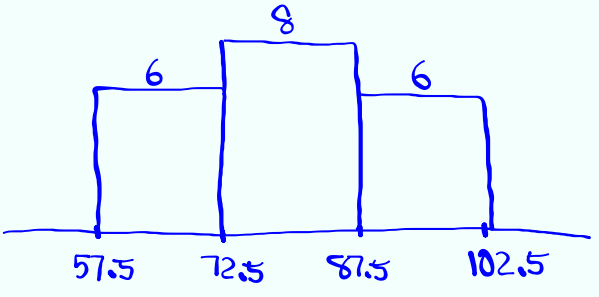
Bar chart

- class limits
- class F



Histogram

- class BNDRS
- class F



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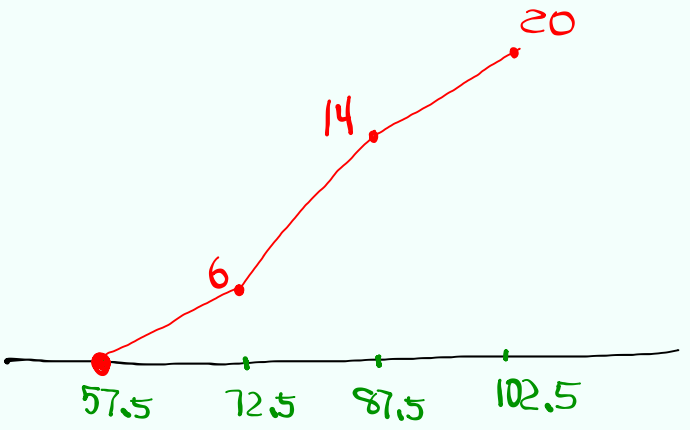
Ogive

- Class BNDRS
- Cum. F
- Start at 0 level



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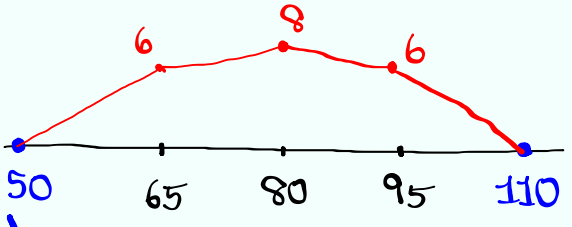
Freq. Polygon

- class MP
- class F
- one additional MP on each side
- Start & End at 0 level.



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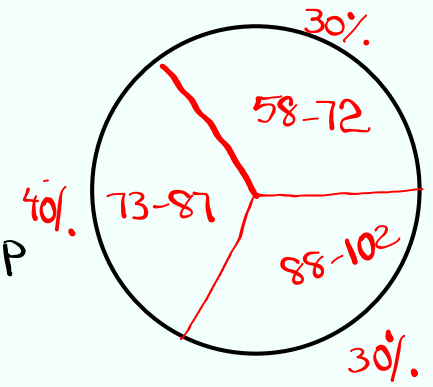
Pie chart

Circle

Class limits or class MP to name each slice

% F for size of each slice



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I randomly selected 25 students, display below are for their ages.

STEM Plot

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

1) $n = 25$

2) Range $= 52 - 18 = 34$

3) Midrange $= \frac{52+18}{2} = 35$

4) Mode 35 & 42

5) Find class width for a freq. table with 4 classes.

$\frac{\text{Range}}{4} = \frac{34}{4} = 8.5$ $\boxed{CW = 9}$

If decimal ⇒ Round-up

If whole ⇒ +1

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Class limits	Class BNDRS	Class MP	Class F	Cum. F	Rel. F	% F
18 – 26	17.5 – 26.5	22	6	6	.24	24%
27 – 35	26.5 – 35.5	31	6	12	.24	24%
36 – 44	35.5 – 44.5	40	6	18	.24	24%
45 – 53	44.5 – 53.5	49	7	25	.28	28%

$$\text{Class MP} = \frac{\text{+ class limits}}{2}$$

$$\text{Rel. F} = \frac{f}{n}$$

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