

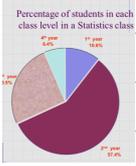
Diagrams :-

lec 3

Pie Chart :-

Displays data in percentages

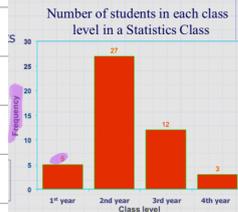
Excellent in showing part vs whole comparisons



Bar Graphs :-

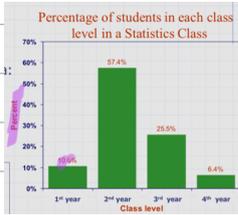
using percentages
writing frequencies

Excellent for showing magnitude differences



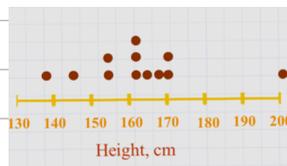
Allows easier comparisons

between data sets of different sizes
مقارنتين البيانات حسب الحجم



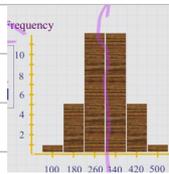
Dotplot :-

خط اعداد توضع عليه النقاط
النقطة تمثل القيم

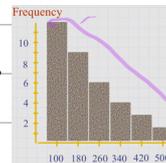


Histogram :-

A- Symmetrical, normal or bell-shaped



D- J-Shaped

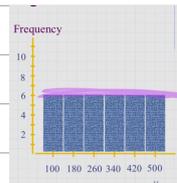


7. By looking at the following set of data: (67, 67, 67, 70, 70, 61, 66, 64, 65, 63) the representing histogram will be:

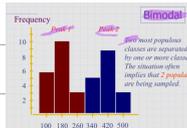
- Symmetrical
- Uniform
- Positively Skewed
- Negatively Skewed

Answer: d. negatively skewed

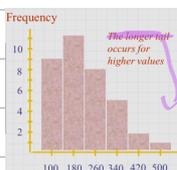
B- uniform or rectangular



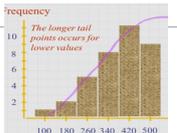
E- Bimodal



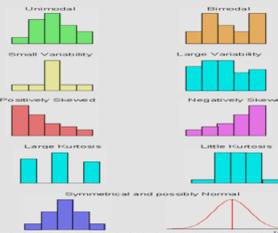
C- Skewed right or + skewed



D- Skewed left or - skewed



SHAPES OF DISTRIBUTIONS



\bar{x}

* Sample Mean :-

بمجموع ويقسم على عددهم

$$\frac{6+3+8+6+4}{5} = 5.4$$

\bar{x}

* Sample Median :-

* لازم اترتيبهم

* اذا عدد طرفي الي بنين

$$\bar{x} = 3$$

* اذا عدد طرفي جميع الرقيمات

$$\bar{x} = \frac{3+4}{2} = \frac{7}{2} = 3.5$$

* ويقسم على 2

* Sample Mode :-

* يمكن يكون اكثر من رقم

* هو القيمة الاكثر تكراراً

1, 2, 2, 3, 3, 3, 3, 4

$$\text{Mode} = 3$$

* Sample Variance :-

s^2

① $\bar{x} = 6, 3, 8, 6, 4$

② $\sum (x - \bar{x})^2 =$

③ $\frac{\sum (x - \bar{x})^2}{n-1} =$

Recall data: 6, 3, 8, 6, 4 and $\bar{x} = 5.4$

x	$x - \bar{x}$	$(x - \bar{x})^2$
6	0.6	0.36
3	-2.4	5.76
8	2.6	6.76
6	0.6	0.36
4	-1.4	1.96
Total (Σ)	0	15.20

The sample variance is:

$$\frac{\sum (x - \bar{x})^2}{n-1} = \frac{15.2}{5-1} = \frac{15.2}{4} = 3.8$$

* Sample Standard Deviation :-

s

① $\bar{x} =$

② $s^2 =$

③ $\sqrt{s^2} =$

Interpreting Standard Deviation



For bell-shaped distributions, the following statements hold:

- Approximately 68% of the data fall between $\bar{x} - 1s$ and $\bar{x} + 1s$
- Approximately 95% of the data fall between $\bar{x} - 2s$ and $\bar{x} + 2s$
- Approximately 99.7% of the data fall between $\bar{x} - 3s$ and $\bar{x} + 3s$

For NORMAL distributions, the word 'approximately' may be removed from the above statements.

$\bar{x} = \text{Mean}$

$s = \sqrt{s^2}$

standard deviation

مثلاً

$\bar{x} \pm 1s$ (مثلاً الطلاب على اقل من 68%)

$\bar{x} \pm 2s$ // 95%

$\bar{x} \pm 3s$ // 99.7%

1. One of the following measures of tendency need(s) data organization:

- Mean
- Median
- Mode
- Two of the above

Answer: b. Median

3. The median of this set of data (2, 4, 3, 6, 1, 8, 9, 2, 5, 7) is:

- 2
- 4
- 4.5
- 4.7

Answer: c. 4.5

13. The value in a series of data with a highest frequency is termed as? Select one

- Mean
- Standard error
- Median
- Mode
- Range

Answer: d. Mode

$\bar{x} - 3s$ $\bar{x} - 2s$ $\bar{x} - 1s$ \bar{x} $\bar{x} + 1s$ $\bar{x} + 2s$ $\bar{x} + 3s$

Percentages: 13.5%, 68%, 95%, 13.5%, 34%, 34%, 1%

Example: Suppose the amount of liquid in 12 oz. Pepsi cans has a roughly bell-shaped distribution with a mean of 12 oz. and standard deviation 0.10 oz.

- Give the interval of the amount of liquid that approximately 68% of the cans will have
 $12 - 2(0.1) \text{ to } 12 + 2(0.1) = 11.8 \text{ to } 12.2 \text{ oz.}$
- Give the interval of the amount of liquid that approximately 95% of the cans will have
 $12 - 2(0.1) \text{ to } 12 + 2(0.1) = 11.8 \text{ to } 12.2 \text{ oz.}$