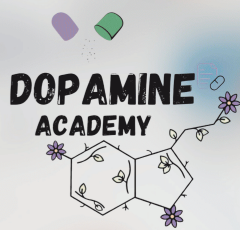


Statistics

Subject: Lecture 7



لجان الرفعات



Subject: _____

C. The Quartiles for grouped Frequency Table :-

Ex:	Class (Sales Volume) in JD	Number of Days	Cumulative Frequency
$\frac{n}{4} = 7.5$	53 - 56	3	3
	57 - 60	5	$\leftarrow Q_1$ 8
$\frac{n}{2} = 15$	61 - 64	9	$\leftarrow Q_2$ 17
	65 - 68	7	$\leftarrow Q_3$ 24
$\frac{3n}{4} = 22.5$	69 - 72	6	30
		$n = 30$	

← بعد هذا نطبق على القانون

The Inter-quartile Range (IQR) :- $Q_3 - Q_1$

- is a robust measure of variation.
- is defined as: the range of middle 50% of observation in the data set.
- Median and inter-quartile range are robust indicators of Central tendency and dispersion.

The Five-Number Summary (FNS) :-

- is a set of descriptive measures that provide information about a data set.
- 1. The minimum : Smallest observation
- 2. The lower quartile : first quartile Q_1
- 3. The median : middle value or second quartile Q_2
- 4. The upper quartile : third quartile Q_3
- 5. The maximum : largest observation

$$SIR = \frac{Q_3 - Q_1}{2}$$

$$\text{Mid quartile Range} = \frac{Q_1 + Q_3}{2}$$

Subject:

FNS helps :-

1. to describe the spread or variation "approximate distribution shape" of the data
2. to determine whether or not any data points are outliers "extreme value"

ex:

0.3, 0.7, 0.8, 1, 1, 2, 2.1, 3.1, 4.2, 4.3, 4.5, 5, 5.8, 17.1

$\frac{+}{2}$

0.3	1	2.6	4.5	17.1
min	Q_1	Q_2	Q_3	max

Box Plot : Box and whisker Plot

helps to ↓

1. Compare between several groups of data sets
2. Identify outliers
3. Identify approximate shape of distribution.

- * Dots outside the box plot → outliers asterisk * solid point •
- * maximum and minimum → are at the ends of each whisker الذيل
- * the upper and lower quartiles → are at the end of the box

Outliers occur because :-

1. of an error during data entry
2. an error in measurement
3. an error in sampling

$$\text{Lower fence} = Q_1 - 1.5(IQR)$$

$$\text{Upper fence} = Q_3 + 1.5(IQR)$$

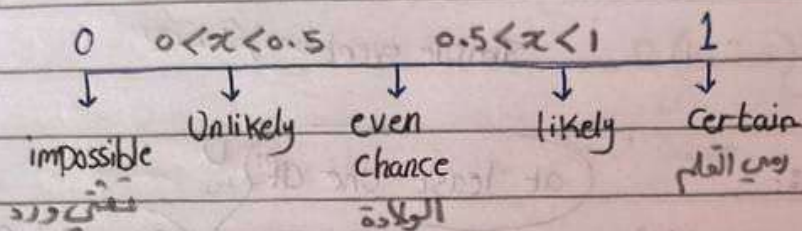
► Subject :

If $Q_2 - Q_1 = Q_3 - Q_2$ then the shape is bell-shaped

If $Q_2 - Q_1 > Q_3 - Q_2$ then the shape is left skewed (-)

If $Q_2 - Q_1 < Q_3 - Q_2$ then the shape is right skewed (+)

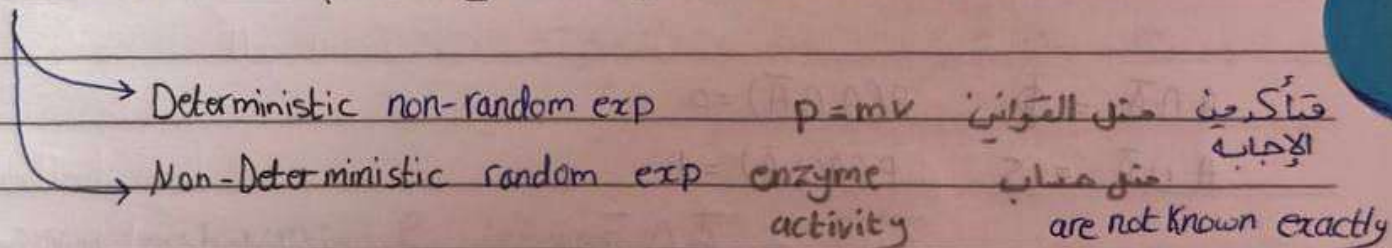
Probability



Provides:-

1. a quantitative description of chances associated with various outcome
2. a bridge between descriptive and inferential statistics.

Experiment :- is the process by which an observation is obtained.



- The sample space (S or Ω) for a random experiment is the set of all possible outcomes.

may contain:

1. A Finite number of outcomes محدود
2. A countably infinite number of outcomes تعداد اعداد صحیح $-\infty \rightarrow \infty$
3. An uncountably infinite number of outcomes اعداد حقیقیه