STATISTICAL APPLICATION.

Digital assignment - 3

REG No: 19BCS0012

NAME : Nithish. G

1) find the rank correlation coefficient for the following

X	47	60	72	62	56	40	39	51	30
Y	62	79	64	70	88	54	60	32	31

X	Y	Rank[X]	Rank[Y]	d	d^2
47	62	6	4	2	4
60	79	3	1	2	4
72	64	1	3	-2	4
62	70	2	2	0	0
56	38	4	7	-3	9
40	54	7	6	1	1
39	66	8	5	3	9
51	32	5	8	-3	9
30	31	9	9	0	0

$\Sigma d^2 = 40 \quad n=9$

$$r = 1 - \frac{6\Sigma d^2}{n^3 - n}$$

$$\Rightarrow 1 - 240/729 - 9$$

$$\Rightarrow 1 - \frac{240}{720} \Rightarrow 1 - 1/3$$

$$\Rightarrow 1 - 0.33 \quad \boxed{r = 0.67}$$

Rank correlation of coefficient is 0.6667

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27 Calculate the mean median mode and standard deviation of the following frequency distribution.

class	5-15	15-25	25-35	35-45	45-55
frequency	8	12	14	9	6

class	frequency (F)	x	d	fd	cumulative frequency
5-15	8	10	-2	-16	8
15-25	12 ← F_0	20	-1	-12	20 → C_m
25-35	14 ← f_2	30 ← C_0	0	0	34 → median class
35-45	9 → f_2	40	1	9	43
45-55	6	50	2	12	49
	$\Sigma f = 49$			$\Sigma fd = -7$	

lower limit (l) = 25

frequency of model class (fj) = 14

Pre median class (M) = 20

$f_0 = 12 \quad f_2 = 9 \quad c = 10 \quad N = 40$

Mean:-

$$\text{Mean} = A + \frac{\Sigma fd}{\Sigma f} \times c$$

$$\Rightarrow 30 + \frac{(-7)}{24} \times 10$$

$$\Rightarrow 30 - 10/7$$

mean $\bar{x} = 28.57$

median:-

$$\text{median} = l + \left[\frac{N/2 - M}{f}\right] \times c$$

$$\Rightarrow 25 + \left[\frac{24.5 - 20}{14}\right] \times 10$$

$$\boxed{\text{median} = 28.2}$$

mode:-

$$\text{mode} = l + \left[\frac{f_1 - f_0}{2f_1 - (f_0 + f_2)}\right] \times c$$

$$\Rightarrow 25 + \left[\frac{14 - 12}{2(14) - 21}\right] \times 10$$

$\Rightarrow 25 + \frac{2}{7} * 10$

mode $= 27.857$

Standard deviation:-

$$\sigma = \sqrt{\frac{\Sigma f d^2}{N} - \left(\frac{\Sigma f d}{N}\right)^2} \times c$$

$$\Rightarrow \sqrt{\frac{77}{5} - \left(-7/5\right)^2} \times 10$$

$$\Rightarrow \sqrt{\frac{385-49}{25}} \times 10. \Rightarrow \sqrt{13.44} \times 10$$

$\Rightarrow 3.66 \times 10 \Rightarrow 36.6$

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(3) Write a short note on scale:-

Scale:

In statistics, the variables or numbers are defined and categorized using different scales of measurements. Each level of measurements scale has specific properties that determine the various use of statistics analysis in this article, we will learn four types of scales such as.

* Nominal
* Interval
* Ordinal
* Ratio scale

A scale is a device or an objects used to measure or quantify any event or another object.

Nominal scale:-

The nominal scale of measurement only satisfy the identity property of measurement values assigned to variable represent a descriptive category but have no inherent numeric value with respect to magnitude.

Ordinal scale:-

The ordinal scale has the property of both identity and magnitude each values on the ordinal scale has a unique meaning and it has an ordered relationship to only others value on

the scale.

Interval scale :-

the interval scale of measurements has the properties objidentity, magnitude and equal internals with an internal scale, you not only know whether different values are bigger or smaller you also know how much bigger or smaller they are.

Ratio scale:

the Ratio scale of measurement satisfies all form of the properties of measurement, identity, magnitude. equal interval and a minimum values of major.