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SUBBMITTED By : 7845

SUBMITTED TO : Sir. Anwer Shmim

SUBJECT : P & Statistics

SEMSTER : Summer

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Q1: Compare & analyse the result of the least square regression equation & coefficient of correlation of "y" on "x" of the following data

Compare your manul results with the outcome of SPSS?

Solution:

X	Y	XY	X^2
53	20	1060	2809
62	32	1984	3844
57	45	2565	3249
71	60	426	5041
78	80	6240	6054
45	**100**	**4500**	**2025**
86	120	10320	7396
87	140	12180	7596
96	160	15360	9216
91	180	16380	8281
94	200	18800	8836
914	210	11280	8836
Σ= 914	Σ=1347	Σ=104929	Σ=73183

$$y = a + bx \quad \text{— (i)}$$

$$a = \bar{y} - b\bar{x} \quad \text{— (ii)}$$

So $$\bar{y} = \frac{\Sigma y}{n} = \frac{1347}{12} = 112.25 \quad \text{— (iii)}$$

$$\bar{x} = \frac{\Sigma x}{n} = \frac{914}{12} = 76.16 \quad \text{— (iv)}$$

where

$$b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

$$b = \frac{12[104929] - [1231158]}{12[73183] - [835396]}$$

$$\boxed{b = 0.6539} \rightarrow (v)$$

Putting eq (iii), (iv) & v

in eq (i)

$$a = \bar{y} - b\bar{x}$$

$$a = 112.25 - 0.6539(76.16)$$

$$\boxed{a = 62.448}$$

a A box Contains 4 red, 4 white and 5 green balls. Three balls are draw from the box together. Find the Probability that they may be (i) all of different Colour (ii) all of the same Colours. ?

Solution :

(i) $n(S) = \binom{13}{3} = 286$

let A = Donate all balls ave Different Colour

$n(A) = \binom{4}{1}\binom{4}{1}\binom{5}{1} = 4 \times 4 \times 5$

$= 80$

$P(A) = \frac{n(A)}{n(S)} = \frac{80}{286} = \boxed{0.28}$

(ii)

let B = Donate all balls of same Colours Red white Green.

$$n(B) = \binom{4}{3} \text{ or } \binom{4}{3} \text{ or } \binom{5}{3}$$

$$= \binom{4}{3} + \binom{4}{3} + \binom{5}{3} =$$

$$4 + 4 + 10 = 18$$

$$P(B) \quad \frac{n(B)}{n(S)} = \frac{18}{286} =$$

$$\boxed{0.063}$$

(b.) of 12 eggs in a refrigerator, 2 are bad. Find from these eggs, a basket is taken at random at random. What is the Probability that (i) exactly one egg is bad (ii) At least one egg is bad?

Solution:

$$n(S) = \binom{12}{4} = 495$$

Let A = Denote the event

The exactly one egg is bad

$$n(A) = \binom{2}{1}\binom{10}{3} = 2 \times 120 = 240$$

$$P(A) = \frac{n(A)}{n(S)} = \frac{240}{495} = \boxed{0.48}$$

Let B = be the event at Least one eggs is bad is selected

$$n(B) = \binom{2}{1}\binom{10}{3} + \binom{2}{2}\binom{10}{2}$$

$= 2 \times 120 + 1 \times 45 = 240 + 45 =$

285

$$P(B) = \frac{n(B)}{n(S)} = \frac{285}{495} =$$

$\boxed{0.58}$

Q3. The following are the score made by three batsmen A, B & C in a series of innings.

A : 12 15 6 73 7 10(45) 199 36 84 29

B = 47 12 76 48 4 (45) 37 48 13 8

C = 15 23 52 4 24 (45) 74 52 13 4

(a) Find the range of batsmen A, B & C?

(b) who is consistent plyer?

(c) compare A with B, B with C & A with C?

Sol:-

A	B	C
12	47	15
15	12	23
6	76	52
73	48	4

A	B	C
27	4	29
45	45	45
199	37	74
36	48	52
84	13	13
29	3	4

Range = $X_m - X_o$

Range of A = $X_m - X_o$

= 199 - 6

= 193

Range of B = $X_m - X_o$

= 45 - 3

= 42

Range of C = $X_m - X_o$

= 45 - 4

= 41

Batsmen A		Batsmen B		Batsmen C	
X	X^2	Y	Y^2	Z	Z^2
12	144	47	2209	15	225
15	225	12	144	23	529
6	36	76	5776	52	2704
73	5329	48	2304	4	16
7	49	4	16	24	570
45	2025	45	2025	45	2025
199	39601	37	1369	74	5476
36	1296	48	2304	52	2704
84	7056	13	169	13	169
29	841	3	9	4	16
$\Sigma x = 506$	$\Sigma x^2 = 56602$	$\Sigma y = 333$	$\Sigma y^2 = 16325$	$\Sigma z = 306$	$\Sigma z^2 = 14440$

Now.

Batsmen A:

$$\bar{x} = \frac{\Sigma x}{n} \qquad n = 10$$

$$= \frac{506}{10} = 50.6$$

$$S_x = \sqrt{\frac{\Sigma x^2}{n} - \left(\frac{\Sigma x}{n}\right)^2}$$

$$S_x = \sqrt{\frac{56602}{10} - \left(\frac{506}{10}\right)^2}$$

$$= \sqrt{\frac{56602}{10} - \left(\frac{506}{10}\right)^2}$$

$$S_{\bar{x}} = 56.676$$

$$C.V = \frac{56.676}{\bar{x}} \times 100$$

$$= \frac{56.676}{50.6} \times 100$$

$$C.V = 112.007$$

Batsmen B :

$$\bar{y} = \frac{\Sigma y}{n} = \frac{333}{10} = 33.3$$

$$SY = \sqrt{\frac{\Sigma Y^2}{n} - \left(\frac{\Sigma Y}{n}\right)^2}$$

$$SY = \sqrt{\frac{16325}{10} - \left(\frac{333}{10}\right)^2}$$

$$SY = 22.88$$

$$C.V = \frac{22.88}{33.3} \times 100 = 68.708$$

Batsmen C

$$\bar{Z} = \frac{\Sigma Z}{n} = \frac{306}{10} = 30.6$$

$$S_Z = \sqrt{\frac{\Sigma Z^2}{n} - \left(\frac{\Sigma Z}{n}\right)^2}$$

$$S_Z = \sqrt{\frac{14440}{10} - \left(\frac{306}{10}\right)^2}$$

$$S_Z = \frac{7\sqrt{259}}{5}$$

$$S_Z = 22.53$$

$$C.V = \frac{S_Z}{\bar{Z}} = \frac{22.53}{30.6} \times 100$$

$$C.V = 73.627$$

Batsmen B is more consistant as it value of coefficent variance is smallest

Compare "A" with "B"

"B" is consistent

Compare 'B' with 'A'

"B" is more consistant

Compare "A" with "C"

"C" is more consistent.