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SUBMITTED TO: SIR. ANWAR SHAMIM

SUBJECT : PROB & STATISTICS

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(7830)

Q No 1 : Compute & analyse the result of the least Square regression equation & coefficient of Correlation of 'Y' on 'X' of the following data. compare your manual results with the outcomes of SPSS ?

Temperature = 53 62 57 71 78 ID(30) 86 87 96 91 94 94

chirps per mint = 20 32 45 60 80 100 120 140 160 180 200 210

X	Y	XY	X^2
53	20	1060	2809
62	32	1984	3844
57	45	2565	3249
71	60	4260	5041
78	80	6240	6084
30	**100**	**3000**	**900**
86	120	10320	7396
87	140	12180	7596
96	160	15360	9216
91	180	16380	8281
94	200	18800	8836
94	210	11280	8836
Σ = 899	Σ = 1347	Σ = 103429	Σ = 72088

$$y = a + bx \quad \text{— (i)}$$

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

So $\bar{y} = \frac{\Sigma y}{n} = \frac{1347}{12} = 112.25$

$\bar{x} = \frac{\Sigma x}{n} = \frac{899}{12} = 74.92$

Where

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

$$b = \frac{12(103429) - (899)(1347)}{12(72088) - (80820)^2}$$

$$\boxed{b = 0.53}$$

putt the value of $\bar{y}$, b, $\bar{x}$ in equ (ii)

$$a = 112.25 - 0.53(74.92)$$

$$a = 112.25 - 39.7076$$

$$\boxed{a = 72.54}$$

Q2 (A)

Solution

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

let A = Donate all balls are different colours

$n(A) = \binom{4}{1}\binom{4}{1}\binom{5}{1} = 4 \times 4 \times 5 = 80$

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

(ii)

let B = Donate all balls of same colours: Red White Green

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

$= \binom{4}{3} + \binom{4}{3} + \binom{5}{3} = 4 + 4 + 10 = 18$

$P(B) = \frac{n(B)}{n(S)} = \frac{18}{286} = \boxed{0.063}$

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Q no 12)

(B)

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

Let A: denote the event the exactly one egg is bad.

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

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

(ii) Let B: be the event at least one egg is bad is selected

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

$= 2 \times 120 + 1 \times 45 = 240 + 45 = 285$

$P(B) = \frac{n(B)}{n(S)} = \frac{285}{495} = \boxed{0.58}$

Q No #3

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

A =	12	15	6	73	7	ID(30)	199	36	84	29
B =	47	12	76	48	4	ID(30)	37	48	13	3
C =	15	23	52	4	24	ID(30)	74	52	13	4

(a) Find the range of batsmen A, B & C ?
(b) Who is more consistent player ?
(c) Compare A with B, B with C & A with C ?

Solution:

	A	B	C
	12	47	15
	15	12	23
	6	76	52
	73	48	4
	7	4	24
(ID)	30	30	30
	199	37	74
	36	48	52
	84	13	13
	29	3	4

So:

$$\text{Range} = X_m - X_o$$

P.T.O

(i) ⇒ Range of A = $X_m - X_o$

= 199 - 6

= 193

(ii) Range of B = $X_m - X_o$

= (ID) 30 - 3

= 27

(iii) Range of C = $X_m - X_o$

= 30 - 3

= 26.

⇒

Batsman A		Batsman B		Batsman 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	576
(ID) 30	900	30	900	30	900
199	39601	37	1369	74	5476
36	1296	48	2304	52	2704
84	7056	13	169	13	169
29	841	3	9	4	16
$\Sigma x = 491$	$\Sigma x^2 = 55477$	$\Sigma y = 318$	$\Sigma y^2 = 15200$	$\Sigma z = 291$	$\Sigma z^2 = 13315$

P.T.O

$$\Rightarrow \quad S_z = \sqrt{\frac{\Sigma z^2}{n} - \left(\frac{\Sigma z}{n}\right)^2}$$

Put value.

$$= \sqrt{\frac{13315}{10} - \left(\frac{29.1}{10}\right)^2}$$

$$\boxed{S_z = 36.37}$$

$$\Rightarrow \quad C.V = \frac{S_z}{\bar{z}}$$

$$= \frac{36.37}{29.1} = \frac{36.37}{29.1}$$

$$\boxed{C.V = 124.98\%}$$

⇒ Bastman A is mor consistant as it valve of co-efficient of varience is smallest.

(i) ⇒ Compare "A" with "B".

⇒ B is conistant:

(ii) ⇒ Caipare "B" with "A"

⇒ B is conistant

(iii) = Compare 'A' with 'C'.

⇒ C is more consistant: