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ID NO # 7752

Subject Probability & Statistic

Submitted to Sir Shamim Anwar.

Dated 23/9/2020.

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Q1 &

X = Temp	53	62	57	71	78	52	86	87	96	91	94	94
Chirp Per m.	20	32	45	60	80	100	120	140	160	180	200	210

The estimated regression line of Y on X is.

$$\hat{Y} = a + bx$$

And the two normal equation are

$$\Sigma y = a\Sigma x + b\Sigma x$$

$$\Sigma XY = a\Sigma x + b\Sigma x^2$$

To complete the necessary Summation we arrange the computations in the table below.

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X	Y	XY	X^2
53	20	1060	2809
62	32	1984	3844
57	45	2565	3249
71	60	4260	2601
78	80	6240	6084
52	100	5200	2704
86	120	10320	7396
87	140	12180	7569
96	160	15360	9210
91	180	16380	8281
94	200	18800	8836
94	210	19740	8836
ξ 921	1347	114089	671319

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Now

$$\bar{x} = \frac{\Sigma x}{n} = \frac{921}{12} = 76.75$$

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

$$b = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{n\Sigma x^2 - (\Sigma x)^2} = \frac{12(114089) - (921)(1347)}{12(71319) - (921)^2}$$

$$b = 16.93$$

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

$$a = 112.25 - (16.93)(76.75)$$

$$a = -1187.37$$

Hence the desired estimated regression line of y on x is.

$$\hat{y} = (a + bx) = -1187.37 + 16.93x$$

$$\hat{y} = 16.93x - 1187.37.$$

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Hence $\hat{y} = 16.93x - 1187.37$ is the estimated regression equation appropriate for predicting the y given the x.

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Q2 (A)

A box Contain 4 red 4 4 white and 5 green balls. Three balls three balls are drawn From the box together. Find the Probability that they may be

(i) all of different Colour

(ii) all of the Same Colour.

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Solution

The total number of Possible equally like outcome is 8 in.

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

$$n(S) = \frac{12}{4!(12-4)!} = 495$$

(i) Let X represents "Exactly one is bad

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

$$n(X) = \left(\frac{2!}{2!(2-1)!}\right)\left(\frac{10!}{3!(10-3)!}\right)$$

$$n(X) = (2)(120)$$

$$n(X) = 240$$

So The Probability is.

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

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B(ii)

Let Y represents "At least on is bad"

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

$$n(Y) = \left(\frac{10!}{3!(10-3)!}\right)\left(\frac{2!}{1!(2-0)!}\right) +$$

$$\left(\frac{10!}{2!(10-2)!}\right)\left(\frac{2!}{2!(2-2)!}\right)$$

$$n(Y) = (120)(2) + (45)(1)$$

$$n(Y) = 240 + 45$$

$$n(Y) = 285$$

So the Probibility is

$$P(Y) = \frac{n(Y)}{n(S)}$$

$$P(Y) = \frac{285}{495}$$

$$P(Y) = 0.58$$

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Q3

A	B	C
12	47	15
15	12	23
6	76	52
73	48	4
7	4	24
52	52	52
199	37	74
366	48	52
84	13	13
29	3	4

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

(b) who is more Consistent Player.

(c) Compare A with B, B with C and A with C?

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Range $= X_m - X_0$

Range of A $= X_m - X_0$

$= 199 - 6$

$= 193$

Range of B $= X_m - X_0$

$= 76 - 3$

$= 73$

Range of C $= X_m - X_0$

$= 74 - 4$

$= 70.$

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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
52	2704	52	2704	52	2704
199	37601	37	1369	74	5476
36	1296	48	2304	52	2704
84	7056	13	169	13	169
29	841	3	9	4	16
Σx	Σx^2	Σy	Σy^2	Σz	Σz^2
513	55281	340	17004	313	15119

Batsman A

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

$$= \frac{513}{10} = 51.3$$

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

$$= \sqrt{\frac{5528}{10} - \left(\frac{513}{10}\right)^2}$$

$$S_x = \$\ 45.59$$

$$C.V = \frac{45.59}{x} \times 100 = \frac{45.59}{51.3}$$

$$C.V = 89.1$$

Batsman B

$$\bar{y} = \frac{\Sigma y}{n} = \frac{340}{10} = 34$$

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

$$= \sqrt{\frac{17004}{10} - \left(\frac{340}{10}\right)^2}$$

$$= 23.33$$

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$$C.V = \frac{23.33}{\bar{x}} \times 100$$

$$= \frac{23.33}{34} \times 100$$

$$= 68.61$$

Batsman C

$$\bar{x} = \frac{\Sigma x}{n} = \frac{313}{10} = 31.3$$

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

$$= \sqrt{\frac{15119}{10} - \left(\frac{313}{n}\right)^2}$$

$$= 23.06.$$

$$C.V = \frac{23.06}{31.3} \times 100$$

$$= 73.67$$

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Batsman B is more consistant as it value of co-efficient of 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.