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Paper	Statistic
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Q1 Part A

$$\Rightarrow u = x - n/2$$

$$\Rightarrow u = x - 7$$

$$\Rightarrow v = y - n/2 \Rightarrow v = y - 19$$

x	y	u	v	u ²	v ²	uv
3	25	-4	6	16	36	-24
4	24	-3	5	9	25	-15
5	20	-2	1	4	1	-2
6	20	-1	1	1	1	-1
7	19	0	0	0	0	0
8	17	1	-2	1	4	-2
9	16	2	-3	4	9	-6
10	13	3	-6	9	36	-18
11	10	4	-9	16	81	-36
13	8	6	-11	36	121	-66
76	172 172	6	-18	96	314	-170

⇒ In the given formula we finding r

So Now:

$$r = \frac{\sum UV - (\sum U)(\sum V)/n}{\sqrt{\left[\sum U^2 - \frac{(\sum U)^2}{n}\right] \left[\sum V^2 - \frac{(\sum V)^2}{n}\right]}}$$

Putting the value of table in formula.

$$r = \frac{-170 - 6 \cdot 8 - 18}{10}$$

$$\sqrt{\left[96 - \frac{96}{10}\right] \left[314 - \frac{314}{10}\right]}$$

$$= \frac{-1700 + 108}{10}$$

$$\sqrt{\left[\frac{960 - 96}{10}\right] \left[\frac{3140 - 314}{10}\right]}$$

$$= \frac{-1592}{10}$$

$$\sqrt{\left[\frac{864}{10}\right] \left[\frac{2826}{10}\right]}$$

$$\Rightarrow \frac{-1592}{10}$$

$$\sqrt{1562.58}$$

$$\delta = \frac{-1592 \times 10}{1562.58 \times 10}$$

$$\delta = \frac{-15,920}{15625.8} \approx -1$$

$$\delta = \underline{1.01} \text{ Answer}$$

Part A

X	Y	KY	X^2	Y^2
20	5	100	400	25
11	15	165	121	325
15	14	210	225	196
10	17	170	100	289
17	8	306	388	64
18	9	162	324	81
21	12	252	441	144
25	16	400	625	258
28	18	504	784	324
165	114	2269	3309	1604

The regression equation of y on x is

$$y = a + b$$

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

$$= b = \frac{20421}{29781} = \frac{18810}{27225}$$

$$= \frac{1611}{2556}$$

$$\Rightarrow b = \boxed{0.63} \rightarrow A$$

$$a = \frac{\sum y}{n} - b \left(\frac{\sum x}{n} \right)$$

$$a = \frac{114}{9} - 0.63 \left(\frac{165}{9} \right)$$

$$= 12.66 - 0.63(18.33)$$

$$a = 12.66 - 11.55$$

$$a = \underline{\underline{1.11}}$$

Thus Regression ΣX on Y

$$X = a + b \cdot Y$$

$$b = \frac{\Sigma XY - \Sigma X \Sigma Y}{n \Sigma Y^2 - (\Sigma Y)^2}$$

$$b = \frac{9(2269) - (185)(114)}{9(1604) - (114)^2}$$

$$b = \frac{20421 - 18810}{14436 - 12396}$$

$$b = \frac{1611}{1440}$$

$$b = \boxed{1.12} = b$$

Thus calculation Regression

n of X on Y

$$X = a + bY$$

$$X = 4.15 + 1.12Y$$

$$X = 5.27 \text{ Pouta}$$

Q1 (Part B)

B points

Part B

$$\bar{x} = \frac{\sum x}{n} = \frac{165}{9} = 18.33$$

$$\bar{y} = \frac{\sum y}{n} = \frac{114}{9} = 12.66$$

$$a = 12.66 - 0.0316 \times 18.33$$

$$a = 12.66 - 0.579$$

$$a = 12.081$$

The estimation regression

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

$$\hat{y} = 12.81 + 0.0316x$$

Prediction of y when $x = 20 + 11 + 15 + 35 + 28 + 18$

$$\text{of } x \quad 12.81 + 0.0316(99)$$

$$y = 12.08 + 3.128$$

$$\hat{y} = 15.209$$

$$n = 5$$

Let X denote number of heads

$$X = 0, 1, 2, 3, 4, 5$$

$$P(X = k) = \binom{n}{k} p^k z^{n-k}$$

$$p = 2/3, z = 1/3$$

$$z = 1 - 2/3$$

$$z = 1/3 - 2/3$$

$$z = \frac{3-2}{3} = 1/3$$

$$z = 1/3$$

$$P(X=0) = \frac{5!}{0!} \left(\frac{2}{3}\right)^0 \left(\frac{1}{3}\right)^{5-0}$$

$$P(X=0) = 1/32 \text{ Ans}$$

$$P(X=1) = \binom{5}{1} \left(\frac{2}{3}\right)^1 \left(\frac{1}{3}\right)^{5-1}$$

$$= \binom{5}{1} \left(\frac{2}{3}\right) \left(\frac{1}{3}\right)^4$$

$$P(X=1) = 5/32$$

$$P(n=2) = \frac{5}{2} \left(\frac{2}{3}\right)^2 \left(\frac{1}{3}\right)^{5-2}$$

$$\Rightarrow \left(\frac{5}{2}\right) \left(\frac{2}{3}\right)^2 \left(\frac{1}{3}\right)^2$$

$$P(n=2) = \boxed{\frac{10}{32}}$$

$$P(n=3) = \binom{5}{3} \left(\frac{2}{3}\right)^3 \left(\frac{1}{3}\right)^{5-3}$$

$$\Rightarrow \binom{5}{3} \left(\frac{2}{3}\right)^3 \left(\frac{1}{3}\right)^2$$

$$P(n=3) = \boxed{\frac{10}{3}}$$

$$P(n=4) = \binom{5}{4} \left(\frac{2}{3}\right)^4 \left(\frac{1}{3}\right)^{5-4}$$

$$= \binom{5}{4} \left(\frac{2}{3}\right)^4 \left(\frac{1}{3}\right)^1$$

$$P(n=4) = \boxed{\frac{5}{32}}$$

$$P(n=5) = \binom{5}{5} \left(\frac{2}{3}\right)^5 \left(\frac{1}{3}\right)^{5-5}$$

$$= \binom{5}{5} \left(\frac{2}{3}\right)^5 \left(\frac{1}{3}\right)^0$$

$$P(n=5) = \boxed{\frac{1}{32}}$$

Hence probability of various heads.

X	0	1	2	3	4	5
$P(X)$	$\frac{1}{32}$	$\frac{5}{32}$	$\frac{10}{32}$	$\frac{10}{32}$	$\frac{5}{32}$	$\frac{1}{32}$

Predicted value of y for $x = 20, 11, 15, 25, 28$

$$y^{\wedge} = a + bx$$

$$1 \cdot 11 + 0 \cdot 63 (20)$$

$$x = 20$$

$$y^{\wedge} = 1 \cdot 11 + 0 \cdot 63 (20)$$

$$\boxed{y^{\wedge} = 13.71} \text{ --- (i)}$$

$$y^{\wedge} = 1 \cdot 11 + 0 \cdot 63 (21)$$

$$\boxed{y^{\wedge} = 10.56} \Rightarrow \text{---} \rightarrow (ii)$$

$$y^{\wedge} = 1 \cdot 11 + 0 \cdot 63 (15)$$

$$\boxed{y^{\wedge} = 10.56} \text{ --- (iii)}$$

$$y^{\wedge} = 1 \cdot 11 + 0 \cdot 63 (28)$$

$$\boxed{y^{\wedge} = 18.75} \text{ --- (iv)}$$

Predicted value of x for y

$$y = 5, 15, 9, 12, 16, 18$$

$$x = 4 \cdot 15 + 1 \cdot 12 (5)$$

$$\boxed{x = 9.75} \text{ --- (i)}$$

$$X = 4.15 + 1.12 (15) \quad y = 15$$

$$\bar{X} = 20.95 \rightarrow \textcircled{ii}$$

~~$$\bar{X} = 17.59$$~~

$$X = 4.15 + 1.12 (9)$$

$$\bar{X} = 17.59 \rightarrow \textcircled{iii}$$

$$X = 4.15 + 1.12 (12) \quad y = 9$$

$$\bar{X} = 17.59 \rightarrow \textcircled{iv} \quad y = 12$$

$$X = 4.15 + 1.12 (16) \quad y = 16$$

$$\bar{X} = 22.09 \rightarrow v$$

$$\bar{X} = 4.15 + 1.12 (18) \quad y = 18$$

$$\bar{X} = 24.31$$

Given Data

2	6	1	5	4	3	3	8	10	1
4	3	3	0	5	2	1	11	10	3
5	3	3	0	3	3	2	2	7	4
1	4	1	4	4	4	6	8	10	7
7	5	0	5	1	2	3	9	2	2

Uncomplete - Frequency distribution

NO	Tolly mark	Frequency	Cumeltil frequency
0		1	1
1		4	5
2		8	13
3		11	24
4		8	32
5		5	37
6		4	41
7		3	44
8		2	46
9		1	47
10		3	50

= So the given information of children B/w
to
So the women.

2	6	1	5	4	3	3	8	10	1
4	3	3	0	5	2	1	4	10	3
5	3	3	6	3	3	2	2	7	4
1	4	2	4	4	4	6	8	10	7
7	5	6	5	3	2	3	9	2	2

Group information distribution for given data.

$N = 50$ data

$N = 50$ $k_0 = 1$ $k_m = 10$

Range = $k_m - k_0$

$R = 10 - 1 = 9$

$k = 1 + 3.3 \log N$

$$= 1 + 33 \log(50)$$

$$= 1 + 3.3 (1.698)$$

$$= 1 + 5.6066$$

$$k = 6.6066 \approx (6)$$

$$h = \frac{9}{7} = 1.285 \approx \boxed{2}$$

we find information from data

$$N = 50 \quad R = 9, \quad k = 6 \quad h = 2$$

classes	frequency	class bunding	main points
0-1	5	0.5-1.5	1
2-3	19	1.5-3.5	2.5
4-5	13	3.5-5.5	4.5
6-7	7	5.5-7.5	6.5
8-9	3	7.5-9.5	8.5
10-11	3	10.5-11.5	11

Total 50

R frequency	R. frequency	C.7	R.e.7
5/50	$5/50 \times 100 = 10$	5	$5/50 = 0$
19/50	$19/50 \times 100 = 38$	24	$24/50 = 0$
13/50	$13/50 \times 100 = 26$	37	$37/50 = 0$
7/50	$7/50 \times 100 = 14$	44	$44/50 = 0$
3/50	$3/50 \times 100 = 6$	47	$47/50 = 0$
3/50	$3/50 \times 100 = 6$	50	$50/50 = 0$