Name: M. ubaid ullah.
ID: 13888
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Department: Allied Health Science
Instructor: Sir! Anwar Shamim.
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Q No(7) (1)

Part (A)

Calculate Coorelation.

X	Y	X^2	Y^2	XY
3	25	9	625	75
4	24	16	576	96
5	20	25	400	100
6	20	36	400	120
7	19	49	361	133
8	17	64	289	136
9	16	81	256	144
10	13	100	169	130
	10	121	100	110
11	8	169	64	104
13				
$\Sigma X = 76$	$\Sigma Y = 172$	$\Sigma X^2 = 670$	$\Sigma Y^2 = 3240$	$\Sigma XY = 1148$

$n = 14$

$$r = \frac{n\Sigma xy - \Sigma x \Sigma y}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

$$r = \frac{14(1148) - (76)(172)}{\sqrt{[14(670) - (76)^2][14(3240) - (172)^2]}}$$

$$= \frac{16072 - 13072}{\sqrt{(9380 - 5776)(45,360 - 29,584)}}$$

(2)

$$r = \frac{3000}{\sqrt{(3604)(15776)}}$$

$$= \frac{3000}{7540}$$

$$r = 0.39$$

Q No 9) (3)

Part (B)

X	y	X^2	Xy
20	5	400	100
11	15	121	165
15	14	225	210
10	17	100	170
17	18	289	136
18	9	324	162
21	12	441	252
25	16	625	400
28	18	784	504
$\Sigma x = 165$	$\Sigma y = 114$	$\Sigma x^2 = 3309$	$\Sigma xy = 2099$

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

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

$$b = \frac{9(2099) - 165(114)}{\sqrt{9(3309) - (165)^2}}$$

$$b = \frac{18,891 - 18,810}{\sqrt{27,781 - (27,225}}$$

(4)

$$b = \frac{81}{\sqrt{556}} = \frac{81}{23}$$

$$b = 3.52$$

$$a = \bar{Y} - b\bar{X}$$

$$= \frac{114}{9} - 3.52\left(\frac{165}{9}\right)$$

$$a = 12.66 - (3.52)(18.33)$$

$$a = -51.86$$

$$\bar{Y} = a + b\bar{X}$$

$$= -51.86 + bx = 51.86 + 3$$

$$X = 20,$$

$$Y = -51.86 + 3.25 \times 20$$

$$Y = 18.53$$

Q No (2) (5) ①

Part (A)

A fair coin is tossed 5 times find the probabilities of obtaining various numbers of heads.

Solution. the R.V. X which denote the number of heads (Sucsess) has a binomial probability distribution with $p = \frac{1}{2}$ and $n = 5$ then $x = 0, 1, 2, 3, 4, 5$

$$P[X = x] = \binom{n}{x} p^x q^{n-x} \quad \left[q = 1 - p = 1 - \frac{1}{2} = \frac{1}{2}\right.$$

$$P[X=0] = \binom{5}{0}\left(\frac{1}{2}\right)^0\left(\frac{1}{2}\right)^5 = \left(\frac{1}{2}\right)^5 = 1 \times \left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

$$P[X=1] = \binom{5}{1}\left(\frac{1}{2}\right)^1\left(\frac{1}{2}\right)^{5-1} = 5 \times \left(\frac{1}{2}\right)^5 = \frac{5}{32}$$

$$P[X=2] = \binom{5}{2}\left(\frac{1}{2}\right)^2\left(\frac{1}{2}\right)^{5-2} = 10 \times \left(\frac{1}{2}\right)^5 = \frac{10}{32}$$

$$P[X=3] = \binom{5}{3}\left(\frac{1}{2}\right)^3\left(\frac{1}{2}\right)^{5-3} = 10 \times \left(\frac{1}{2}\right)^5 = \frac{10}{32}$$

$$P[X=4] = \binom{5}{4}\left(\frac{1}{2}\right)^4\left(\frac{1}{2}\right)^{5-4} = 5 \times \left(\frac{1}{2}\right)^5 = \frac{5}{32}$$

$$P(X=5) = \binom{5}{5}\left(\frac{1}{2}\right)^5\left(\frac{1}{2}\right)^{5-5} = 1 \times \frac{1}{2} = \frac{1}{32}$$

8 (15)

(6)

Hence binomial distribution propibity is:

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

Complete

Q No (2) (7)

Part (B)

(1) The probability of winning A is 2/3 in series of 10 games. The probability that A will win atleast 4 games is

$$P(X \geq 4) = 1 - P(X \leq 4)$$

$$= 1 - \left[\left(\frac{1}{3}\right)^{10} + 10\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)^{9} + 45\left(\frac{2}{3}\right)^{2}\left(\frac{1}{3}\right)^{8} + 120\left(\frac{2}{3}\right)^{3}\left(\frac{1}{3}\right)^{7}\right]$$

$$= 1 - \frac{1}{59049}\left(1 + 20 + 180 + 960\right)$$

$$= 1 - \left(\frac{1161}{59049}\right)$$

$$= \boxed{0.9803}$$

(2) The probability that A will Exactly equal to 4/10 games.

$$P(X = 4) = \binom{10}{4}\left(\frac{2}{3}\right)^{4}\left(\frac{1}{3}\right)^{4}$$

$$= \frac{1120}{2187} = \boxed{0.512}$$

(3) The probability of A winning is exactly equal to 11 games. is Impossible because the total games are 10 and Thier is no chance of winning 11 games in 10 games. 11 is Impossible Event.

(4) The probability that A will win 6 or more games, is

$$P(x \geq 6) = \sum_{x=6}^{10} \binom{10}{x} \left(\frac{2}{3}\right)^x \left(\frac{1}{3}\right)^{10-x}$$

$$= \binom{10}{6}\left(\frac{2}{3}\right)^6\left(\frac{1}{3}\right)^2 + \binom{10}{7}\left(\frac{2}{3}\right)^7\left(\frac{1}{3}\right)^3$$

$$+ \binom{10}{8}\left(\frac{2}{3}\right)^8\left(\frac{1}{3}\right)^2 + \binom{10}{9}\left(\frac{2}{3}\right)^9\left(\frac{1}{3}\right)^1$$

$$+ \binom{10}{10}\left(\frac{2}{3}\right)^{10}\left(\frac{1}{3}\right).$$

$$= \frac{4480}{1983} + \frac{5120}{19683} + \frac{1280}{6561} + \frac{5120}{59049} + \frac{1024}{59049}$$

$$= \boxed{0.7869}$$

Q No: (3) (A) (9)

Q:03 (a) Give data

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

Un-Grouped Frequency distribution

NO	Tally mark	Frequency	Cumulative Fre
0	1	1	1
1	IIII	4	5
2	𝍸 III	8	13
3	𝍸 𝍸 I	11	24
4	𝍸 III	8	32
5	𝍸	5	37
6	IIII	4	41
7	III	3	44
8	II	2	46
9	I	1	47
10	III	3	50

Q No (3) Part (A)

Complete.

Q No(3) Ans. (10)

Q:(03) Given information of children born to 50 women

Part (b)

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

Grouped frequency distribution For given data.

$N = 50$ $X_0 = 1$, $X_m = 10$

Range $= X_m - X_0 =$

$R = 10 - 1 = \boxed{9}$

$K = 1 + 3.3 \log N$

$= 1 + 3.3 \log(50)$

$= 1 + 3.3 (1.698)$

$= 1 + 5.6066$

$K = 6.606 = \boxed{6}$

$h =$ class interval $= \frac{\text{Rang}}{K}$

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

(11) (40) (2)

we find out the information from data.

$N = 50$, $R = 9$, $K = 6$, $h = 2$

classes	Frequency	class boundry	Midpoint
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.f	R.c.f
5/50	5/50 × 100 = 10	5	5/50 = 0.0
19/50	19/50 × 100 = 38	24	24/50 = 0.
13/50	13/50 × 100 = 26	37	37/50 = 0.
7/50	7/50 × 100 = 14	44	44/50 = 0
3/50	3/50 × 100 = 6	47	47/50 = 0
3/50	3/50 × 100 = 6	50	50/50

part (b) @ No (3) Complet