

B.Com first Semester

Business statistics

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Reference

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Chapter- Correlation

Concurrent Deviation Method (C.D.)

$$r_c = \pm \sqrt{\pm \left(\frac{2C - N}{N} \right)} \quad C = \text{positive}$$

-x- = +	-x = -	Ni
-x+ = -	+x = =	Ni
+x- = -	=x- =	Ni
+x+ = +	=x+ =	Ni

0 = x = +

III 39:- Calculation of Coefficient of correlation

Year	X	dev ^x sign	Y	dev ^y sign	dxdy
1993	350	0	300	0	0
94	354	+	280	-	-
95	375	+	270	-	-
96	380	+	260	-	-
97	390	-	290	+	-
98	365	+	280	-	-
98	380	+	272	-	-
					<u>C = 0</u>

$$r_c = \pm \sqrt{\pm \left(\frac{2C - N}{N} \right)} \quad \boxed{\text{NEG}}$$

$$= \pm \sqrt{\pm \left(\frac{2 \times 0 - 6}{6} \right)}$$

$$\boxed{r_c = -1} \quad \text{Ans}$$

It indicates perfect neg. correlation

Idol -	X	dx	Y	dy	dx dy
	300		310		
	320	+P	305	-Y	
	325	+PC	305	=-1	
	315	+PC	312	+1	
	315	=-2	308	-5	
	320	+PC	302	-3	
	330	+2C	304	+1	
	330	=-2	304	=-1	
	340	+PC	302	=-1	
	350	+P	300	=-1	
	+		-		<u>C=2</u>

$$x_c = \frac{t}{\pm \sqrt{\frac{t(2C-N)}{N}}}$$

$$= \frac{\pm}{\pm \sqrt{\frac{2 \times 2 - 9}{9}}}$$

$$= \frac{\pm}{\pm \sqrt{\frac{4-9}{9}}}$$

$$\sqrt{\frac{-5}{9}}$$

$$= \pm \sqrt{(-0.55)}$$

$$x_c = 0.745$$

Concurrent Deviation Method

Year	X	direction dx	Y	direction dy	dir dy
1990	160	-	292	-	-
1991	164	+	280	-	-
1992	172	+	260	-	-
1993	182	+	234	-	-
1994	166	-	266	+	-
1995	170	+	254	-	-
1996	178	+	230	-	-
1997	192	+	190	-	-
1998	186	-	200	+	-
		$N = 8$			$C = 0$

$$MC = \pm \sqrt{\pm \left(\frac{2C - N}{N} \right)}$$

$$= \pm \sqrt{\pm \left(\frac{2 \times 0 - 8}{8} \right)}$$

$$= \pm \sqrt{\pm (-1)}$$

$$\boxed{MC = -1}$$

It indicates ^{perfect} neg. correlation.

74/	Year	Productivity
	1995	-
	1996	Nil
	1997	Nil
	1998	+
	1999	+
	2000	+
	2001	-
	2002	+
		$C=4$ or $N=8$

$$r_c = \pm \sqrt{\pm \left(\frac{2C - N}{N} \right)}$$

$$= \pm \sqrt{\pm \left(\frac{2 \times 4 - 8}{8} \right)}$$

$r_c = 0$ It indicates no correlation.

75/ $n=8, c=0$

$$r_c = \pm \sqrt{\pm \left(\frac{2C - N}{N} \right)}$$

$$= \pm \sqrt{\pm \left(\frac{2 \times 0 - 8}{8} \right)}$$

$$= \pm \sqrt{\pm \left(\frac{-8}{8} \right)}$$

$$= \pm \sqrt{\pm (-1)}$$

$$r_c = -1$$

It indicates perfect neg. correlation.

Concurrent Deviation Method

68. Find out coefficient of concurrent deviation from the following data :

Years :	1990	1991	1992	1993	1994	1995	1996	1997	1998
Supply :	160	164	172	182	166	170	178	192	186
Price :	292	280	260	234	266	254	230	190	200

Ans. $r_c = -1$

(B.Com., Kurukshetra 1998; M.A., Agra 1997, 99)

69. From the data given below, compute the correlation coefficient by the method of concurrent deviations :

Year :	1995	1996	1997	1998	1999	2000	2001
Supply :	150	154	160	172	160	165	180
Price :	200	180	170	160	190	180	172

Ans. $r_c = -1$

(B.Com., Agra 1995; Meerut 2000)

70. Find the coefficient of correlation by the method of concurrent deviations :

X :	10	15	21	18	20	30	34	32	31
Y :	16	12	17	15	19	18	25	23	24

Ans. $r_c = +0.5$

(B.Com., Punjab 1998)

71. From the following data calculate coefficient of correlation by concurrent deviation method :

X :	100	120	135	135	115	110	120
Y :	50	40	60	80	80	55	65

Ans. $r_c = 0$

(M.A., Agra 1994)

72. Calculate coefficient of correlation by concurrent deviation method between supply and price :

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Supply Indices :	114	127	128	120	120	123	127	127	133	137
Price Indices :	108	104	104	106	100	98	99	99	97	92

Ans. $r_c = -0.745$

(M.A., Meerut 1997)

73. Find the coefficient of concurrent deviations for the following data :

X :	65	40	35	75	75	80	35	20	80	80	50
Y :	60	55	50	56	30	70	40	35	80	80	75

Ans. $r_c = +0.894$

(B.Com., Agra 1997)

74. Results of products of symbol deviations in X and Y series are as follows :

Year	1995	1996	1997	1998	1999	2000	2001	2002
Product of Symbol (Minus) Deviation :	-	+	+	+	-	+

Calculate the coefficient of correlation by a suitable method.

Ans. $r_c = 0$

75. Given : $n = 8, C = 0$, use the above to interpret the relationship between supply and price by a suitable method of correlation.

Ans. $r_c = -1$ (Perfect Negative Correlation)

76. Obtain a suitable measure of correlation from the following data regarding changes in price index of two shares X and Y during the year :

Changes over the previous month

Month :	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
X :		-4	+13	+4	-2	+5	-9	-12	+17	+13	-12	-1
Y :		+4	+6	+2	+3	+5	-2	-5	+5	-3	-2	-5

Ans. $r_c = +0.6742$