

" Sheel, Sharir, Adhyayan "



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Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh

'B' Accredited

Department of Statistics

CERTIFICATE

Exam no.

Date:- 30/05/2022

This is to certify that ~~she~~ / He *Kadam Pratik Bhaim*  
has satisfactorily completed the submission as per required in  
Statistics course prescribed by Shivaji University, Kolhapur for  
B.Sc.II practical examination under my supervision in the year  
2021-22

Teacher in charge

Examiner

Head HEAD  
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# Case Study.

Student Name: —

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- 4) Yadav Banket Balaso

Class: — B.Sc. II

Group: — CMS

Q. 1) A Report on: —

Analysis of use of specs for boy's and girls using test of independence of attributes.

Guidance: Momin. S.M

Year: — 2021/2022



- slight modification

A Report on

AN IN-COURSE STUDY OF CORRELATION COEFFICIENT BETWEEN HEIGHT & WEIGHT OF GIRLS AND BOYS.

CORRELATION COEFFICIENT BETWEEN HEIGHT & WEIGHT OF GIRLS.

Number of girls	Height	Weight
1	165	45.2
2	159	52
3	156	43.1
4	149	41
5	158	48
6	163	55

Formulae -  $\bar{x} = \frac{\sum x_i}{n} = \frac{103}{6} = 17.17$

Correlation Coefficient  $r = \frac{\text{Cov}(x, y)}{\sigma_x \sigma_y}$

$\text{Cov}(x, y) = \frac{1}{n} \sum x_i y_i - \bar{x} \bar{y}$

$\sigma_x = \sqrt{\frac{\sum x_i^2}{n} - \bar{x}^2}$

$\sigma_y = \sqrt{\frac{\sum y_i^2}{n} - \bar{y}^2}$

$\sum x_i y_i = 1011.58$

observation table -

No.	$x$	$u_i = \frac{x-14}{4}$	$u_i^2$	$y$	$v_i = y-41$	$v_i^2$	$u_i v_i$
1	165	16	256	45	4	16	64
2	159	10	100	52	11	121	110
3	156	7	49	43	2	4	14
4	149	0	0	41	0	0	0
5	158	9	81	48	7	49	63
6	163	14	196	55	14	196	196
	950	56	682	284	38	386	447

Calculation -

$$\bar{u} = \frac{\sum u_i}{n} = \frac{56}{6} = 9.3333$$

$$\bar{v} = \frac{\sum v_i}{n} = \frac{38}{6} = 6.3333$$

$$\text{Cov}(u, v) = \frac{1}{n} \sum u_i v_i - \bar{u} \bar{v}$$

$$= \frac{1}{6} 447 - (9.3333 \times 6.3333)$$

$$= 74.5 - 59.1105$$

$$= 15.3895$$

$$\sigma_u = \sqrt{\frac{\sum u_i^2}{n} - \bar{u}^2}$$

$$= \sqrt{\frac{682}{6} - (9.3333)^2}$$

$$= \sqrt{113.6666 - 87.1104}$$

$$= \sqrt{26.5561}$$

$$= 5.153206 \text{ for height}$$

$$\text{for } Gv = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}} \text{ for weight}$$

$$= \sqrt{\frac{386}{6} - (6.3333)^2}$$

22

22

22

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12

$$= \sqrt{64.3333 - 40.1106}$$

$$= \sqrt{24.2226}$$

$$= 4.9219$$

$$= 4.9219$$

$$= 4.9219$$

$$= 4.9219$$

$$\text{correlation coefficient } (r) = \frac{\text{cov}(u, v)}{\sigma_u \cdot \sigma_v}$$

$$= \frac{15.3895}{5.1532 \times 4.9219}$$

$$= \frac{15.3895}{25.3635}$$

$$= 0.6068$$

$$r = 0.6068$$

Result - correlation coefficient of girls  
(r) = 0.6068.

The height & weight of girls is  
positively correlated.

correlation coefficient bet<sup>n</sup> height & weight of boy's.

Number of boy's	Height (x)	Weight (y)
1	168	56
2	173	69
3	178	65
4	178	65
5	172	55
6	175	66
7	170	58
8	176	61
$\Sigma$	172	66

Formulae =

$$\text{Correlation coefficient } (r) = \frac{\text{cov}(x, y)}{\sigma_x \cdot \sigma_y}$$

$$\text{cov}(x, y) = \frac{1}{n} \Sigma x_i y_i - \bar{x} \bar{y}$$

$$\sigma_x = \sqrt{\frac{\Sigma x_i^2}{n} - \bar{x}^2}$$

$$\sigma_y = \sqrt{\frac{\Sigma y_i^2}{n} - \bar{y}^2}$$

Calculation -

Sr No	X	$u_i = X - 172$	$u_i^2$	Y	$V_i = Y - 55$	$V_i^2$	$u_i V_i$
1	168	-4	16	56	1	1	-4
2	173	1	1	69	14	196	14
3	178	6	36	65	10	100	60
4	178	6	36	65	10	100	60
5	172	0	0	55	0	0	0
6	175	3	9	63	8	64	24
7	170	-2	4	68	13	169	-26
8	176	4	16	61	6	36	24
9	172	0	0	66	11	121	0
		14	118	66	66	684	181

Calculation -

$$\bar{u} = \frac{\sum u_i}{n} = \frac{14}{9} = 1.5556$$

$$\bar{v} = \frac{\sum V_i}{n} = \frac{66}{9} = 7.3333$$

Correlation coefficient =  $\frac{\text{Cov}(u, v)}{\sigma_u \sigma_v}$

$$\text{Cov}(u, v) = \frac{1}{n} \sum u_i v_i - \bar{u} \bar{v}$$

$$= \frac{1}{9} (181) - (1.5556 \times 7.3333)$$

$$= \frac{1}{9} (181) - 11.4077$$

$$= 8.7034$$

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$$\sigma_u = \sqrt{\frac{\sum u_i^2}{n} - \bar{u}^2}$$

$$= \sqrt{\frac{118}{9} - 2.4199^2}$$

$$\sigma_v = \sqrt{\frac{\sum v_i^2}{n} - \bar{v}^2}$$

$$= \sqrt{\frac{10.6912}{9} - 1.1889^2}$$

$$\sigma_w = \sqrt{\frac{\sum w_i^2}{n} - \bar{w}^2}$$

$$= \sqrt{\frac{684}{9} - 8.7778^2}$$

$$= \sqrt{22.2227}$$

$$\bar{w} = 4.7141$$

corr<sup>n</sup> coefficient (r) =  $\frac{\text{cov}(u,v)}{\sigma_u \sigma_v}$

$$\frac{(11.9) \text{ cov} = \frac{11.9 \times 8.7034}{3.2697 \times 4.7141}}$$

$$\frac{103.75}{15.4137} = 6.731$$

$$0.5 \times 22.2227 - 10 = 0.5644$$

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Result - Correlation coefficient of boy's height and weight of boy's is positively correlated.