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16/ENG02/001
Computer ENGR
300 L

Given $d = \gamma\beta^t$ ...... (i)

Comparing eqn(1) to $y = m$

$\log d = \log \alpha + t \log \beta$

where $a_0 = \log \alpha$

$a_1 = \log \beta$

	$Y = \log d$	$t = x$	xY	$d(t)$	x^2	Y^2
				0		
1	0.301029996	0	0	0	0	0.0906199
2	0.698970004	1	0.698970004	1	1	0.4885590
3	1.278753601	2	2.557507202	2	4	1.6352107
4	1.698970008	3	5.096910013	3	9	2.886409
5	2.178976947	4	8.715907789	4	16	4.747940
6	2.672097858	5	13.36048929	5	25	7.140106 96
7	3.15685190911	6	18.94111143	6	36	9.9657139 2
8	3.65436409,	7	25.58058364	7	49	13.354413 4
9	4.111800007	8	32.89440006	8	64	16.906899
10	4.61416391	9	41.5864537	9	81	21.289733
11	5.045405135	10	50.45405135	10	100	25.456129

$\Sigma y = 29.41132046$

$\Sigma x = 55$

$\Sigma xy = 199.8268839$

$\Sigma x^2 = 385$

$\Sigma y^2 = 103.9620485$

$\Sigma y = a_0 N + a_1 \Sigma x$ ...... (i)

$29.41132046 = a_0(11) + a_1(55)$

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(2)

$\Sigma xy = a_0 \Sigma x_1 + a_1 \Sigma x^2$

$199.8268839 = a_0(55) + a_1(385) \ldots (ii)$

Solving eqn (i) & (ii)

$29.41133046 = 11a_0 + 55a_1$

$199.8268839 = 55a_0 + 385a_1$

$$a_0 = \frac{\begin{vmatrix} 29.41133046 & 55 \\ 199.8268839 & 385 \end{vmatrix}}{\begin{vmatrix} 11 & 55 \\ 55 & 385 \end{vmatrix}}$$

$$\frac{(29.41133046)(385) - (55)(199.8268839)}{(11 \times 385) - (55 \times 55)}$$

$a_0 = 0.\cancel{3}7511$

$$a_1 = \frac{\begin{vmatrix} 11 & 29.41133046 \\ 55 & 199.8268835 \end{vmatrix}}{\begin{vmatrix} 11 & 55 \\ 55 & 385 \end{vmatrix}}$$

$$a_1 = \frac{(11 \times 199.8268835) - (29.41133046 \times 55)}{(11 \times 385) - (55 \times 55)}$$

$a_1 = 0.47973$

$a_0 = \log \alpha$ $\qquad$ $a_1 = \log \beta$

$0.27511 = \log \alpha$ $\qquad$ $0.47973 = \log \beta$

$\alpha = 1.884$ $\qquad$ $\beta = 3.0181$

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$\alpha = 1.8841$
$\beta = 3.0181$

d Collelation Co-efficient

$$R = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{(N\Sigma x^2 - (\Sigma x)^2)(N\Sigma y^2 - (\Sigma y)^2)}}$$

$$R = \frac{(11 \times 199.8268839) - (55)(29.41133046)}{\sqrt{(11 \times 385 - 55^2) \times [(11 \times 103.9620483 - (29.41187846)^2]}}$$

$R = 0.999844 8312$

$R_{square} = (0.9998448312)^2$
$= 0.9996896864$

For manual method
$R = 0.9998448312$
$R^2 = 0.9996896862$

From matlab
$R = 0.9998$
$R^2 = 0.9997$

For Excel
$R = 0.99984483235763$
$R^2 = 0.99968968879 2257$

e From observation for all the methods used to Solve the Collecation Coefficient and its square; it can be seen that $R^2 < R < 1$ i.e the value of the square of the Corralation Coefficient is Lesser than the actual value of the correcation Co-efficient