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Enrol no: [redacted]08

x	y	xy	x^2	y^2
11.8	10.4	122.72	139.24	108.16
12.5	16.5	206.25	~~246.49~~ 156.25	[redacted] 272.25
15.7	22.9	359.53	246.41	524.41
19.2	26.6	516.72	368.64	707.56
21.9	33.8	740.22	479.61	1142.44
23.3	42.8	997.24	542.89	1831.84
$\Sigma x =$ 104.4	$\Sigma y =$ 153	$\Sigma xy =$ 2936.68	$\Sigma x^2 =$ 1933.12	Σy^2 4586.66

a] $SS(x) = \Sigma x^2 - \frac{(\Sigma x)^2}{n} = 1933.12 - \frac{(104.4)^2}{6}$

$= 116.56$

$SS(y) = \Sigma y^2 - \frac{(\Sigma y)^2}{n} = 4586.66 - \frac{(153)^2}{6}$

$= 685.16$

$SP(xy) = \Sigma xy - \frac{\Sigma x \Sigma y}{n} = 2936.68 - \frac{104.4 \times 153}{6}$

$= 274.48$

$r = \frac{SP(xy)}{\sqrt{SS(x)\ SS(y)}} = \frac{274.48}{\sqrt{116.56 \times 685.16}} = \frac{\text{[redacted]}}{} = 0.99$

The variable x (inflation rate) and
y (lending rate) are positively ~~correte~~
correlated

b.) we need to test

$H_0: \rho = 0$ vs $H_1: \rho \neq 0$

test statistic

$$t = \pm \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} = \frac{0.97\sqrt{6-2}}{\sqrt{1-(0.97)^2}}$$

$$= 7.98$$

$|t| > t_{n-2} = t_{0.05} = 2.776$ so H_0 is rejected

we can conclude that lending rate increases significantly with the increase of inflation rate.

@

e/from 4

$SS(x) = 116.56$

$SS(y) = 685.16$

$SP(xy) = 274.90$

Now $b = \frac{SP(xy)}{SS(x)} = \frac{274.90}{116.56} = 2.355$

$a = \bar{y} - b\bar{x} = \frac{\Sigma y}{n} - b\frac{\Sigma x}{n}$

$= \frac{153}{6} - (2.355)\frac{1044}{6}$

$\therefore a = -15.477$

So. fitted line $\hat{y} = a + bx$

$= -15.477 + 2.355x$

d). The estimation when $x = 25.5$

$$\text{then } \hat{y} = -15.477 + 2.355(25.5)$$

$$= 44.58$$

e) we have to test $H_0: \beta = 0$ vs $H_1: \beta \neq 0$

$$s^2 = \frac{SS(y) - b\,SP(xy)}{n-2} = \frac{685.16 - 2.355(279.40)}{6-2}$$

$$= 9.7$$

test statistic

$$t = \frac{b}{\sqrt{s^2/SS(x)}} = \frac{2.355}{\sqrt{9.7/116.56}}$$

$$= 8.164$$

~~Section~~

Since, $|t| > t_{\alpha/2} = t_{4} = 2.776$, so H is rejected. thus regression, significance.