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Id: 20-42668-1 Section: O

Assignment-4

11.1

Solution:

x	y	Σxy	Σx^2	Σy^2
11.8	10.4	122.72	139.24	108.16
12.5	16.5	206.25	156.25	272.25
15.7	22.9	359.53	246.49	524.41
19.2	26.6	510.72	368.64	707.56
21.9	33.8	740.22	479.61	1142.44
23.3	42.8	997.24	542.89	1831.34
$\Sigma x = 104.4$	$\Sigma y = 153$	$\Sigma xy = 2936.68$	$\Sigma x^2 = 1933.12$	$\Sigma y^2 = 458666$

a) $SS(X) = \Sigma x^2 - \frac{(\Sigma x)^2}{4}$

$= 1933.12 - \frac{(104.4)^2}{6}$

$= 116.56$

$SS(Y) = \Sigma y^2 - \frac{(\Sigma y)^2}{4}$

$= 4586.66 - \frac{(153)^2}{6} = 685.15$

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

$$= 274.48$$

$$r = \frac{SP(xy)}{\sqrt{SS(x) \times SS(y)}} = \frac{274.48}{\sqrt{116.56 \times 685.15}} = 0.9713$$

b) $H_0 : P = 0$ Vs $H_1 : P \neq 0$

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

$$= 8.162 > t4$$

we Conclude that inflation rate is significantly Corelated with the lending Rate.

c) $$b = \frac{SP(xy)}{SS(x)} = \frac{274.48}{116.56} = 2.35$$

$$a = \frac{\Sigma y}{n} - b\frac{\Sigma x}{n} = \frac{153}{6} - 2.35\frac{104.4}{4} = 15.4747$$

$$\hat{y} = a + bx = -15.4747 + 2.35x$$

d) if $x = 25.5$; then. $\hat{y} = -15.4747 + (2.35 \times 2.35)$

$= 44.474$

e) $H_0 : \beta = 0$ Vs $H_1 : \beta_1 \neq 0$

$$s^2 = \frac{SS(y) - b\,SP(xy)}{n-2} = \frac{685.16 - 2.35 \times (274.48)}{6-2}$$

$$= 9.7$$

$$t = \frac{b}{\sqrt{s^2/SS(x)}} = \frac{2.35}{\sqrt{9.7/116.56}} = 8.16 > t_4$$

Regression is Significent.