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U.1

x	y	xy	x^2	y^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	776.56
21.9	33.8	740.72	479.61	1142.44
23.3	42.8	997.24	542.89	1831.84

$\sum x = 104.9$ $\sum y = 153$ $\sum xy = 2936.68$

$\sum x^2 = 1933.12$

Compute correlation Coefficient

$$SS(x) = \sum x^2 - \frac{(\sum x)^2}{n}$$

$$= 1933.12 - \frac{(104.9)^2}{6}$$

$$= 116.56$$

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

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

$$= 685.16$$

$$SP(xy) = \Sigma xy - \frac{\Sigma x \cdot \Sigma y}{n}$$

$$= 2936.68 - \frac{104.4 \times 153}{6}$$

$$= 274.48$$

$$\therefore r = \frac{SP(xy)}{\sqrt{SS(x) \cdot SS(y)}}$$

$$= \frac{2974.48}{\sqrt{116.56 \times 6\,825.16}}$$

$$\approx 0.98$$

the correlation between variable (x) and y is sto strongly politive.

Performing hypothesis test

$H_0 : P =$ against $HA : P \neq 0$

$$t = \frac{r_0 \sqrt{n-2}}{\sqrt{1-b^2}} \sim t_{n-2}$$

$$= \frac{.98 \sqrt{6-2}}{\sqrt{1-(0.98)^2}}$$

$$= 9.84$$

$1 + 1 > t(n-2) = 4;$ thus H_0 is neg rejected.

c) Filting regression line of y on u

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

$$= \frac{153}{6} - b\frac{104.4}{6} - ①$$

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

$$= 2.36$$

from (i) $\Rightarrow$

$$a = \frac{153}{6} - (2.36) \frac{164.4}{6}$$

$$= -15.564$$

Fitted line : $\hat{y} = -15.564 + 2.36 x$

d) lending rate when the inflation rate

will be ≈ 25.5

If, $x \neq 25.5$, then $y = -15.564 + 2.36$

$$= 44.616$$

<u>Ans</u>