

日期: /

1.

$$(a) b = \frac{SP}{SS_X}$$

$$SP = (2+28+15+2+70+21) - \frac{18 \times 36}{6} = 30$$

$$SS_X = (1+16+9+4+25+9) - \frac{18 \times 18}{6} = 10$$

$$\Rightarrow b = \frac{SP}{SS_X} = \frac{30}{10} = 3$$

$$a = \bar{Y} - b\bar{X} = 6 - 3 \times 3 = -3$$

回归方程为 $\hat{Y} = 3x - 3$

$$(b) \quad X=1, \hat{Y}=0 \qquad X=4, \hat{Y}=9. \qquad X=3, \hat{Y}=6$$

$$X=2, \hat{Y}=3 \qquad X=5, \hat{Y}=12 \qquad X=3, \hat{Y}=6$$

$$(c) \quad r = \frac{SP}{\sqrt{SS_X \cdot SS_Y}} \qquad SS_Y = 324 - \frac{36 \times 36}{6} = 108$$

$$r = \frac{30}{\sqrt{108 \times 10}} \approx 0.91$$

$$(d) \quad SS_{\text{error}} = (1-r^2)SS_Y \approx 18$$

$$SS_{\text{error}} = \sum (Y - \hat{Y})^2$$

$$= 4 + 4 + 1 + 4 + 4 + 1 = 18$$

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	SS	df	MS	F
回归	90	1	90	25
残差	18	5	3.6	
总和	108	6		

取 $\alpha = 0.05$, $F_{crit}(1, 5) = 6.61$

$F > F_{crit}$