

Regression Practice - Answers

1. Below is data concerning employee performance scores and their level of anxiety on the job.

| anxiety | performance |
|---------|-------------|
| 18 | 7 |
| 19 | 8 |
| 11 | 6 |
| 16 | 6 |
| 15 | 5 |
| 16 | 7 |
| 12 | 4 |
| 6 | 3 |
| 9 | 4 |
| 9 | 5 |

a. Compute the correlation between anxiety and performance. Report whether that correlation is significant at $\alpha = .05$, and report in APA format.

$$r = .87, p < .05.$$

b. Calculate the regression equation for this data.

$$y' = 1.35 + .32x.$$

c. What performance score would you predict for someone with an anxiety score of 20?

$$\text{If } x = 20, \text{ then } y' = 7.75$$

d. What proportion of variation in performance can be explained by anxiety?

$$r^2 = .76$$

e. What is the standard error of estimate for this data?

$$s_{y.x} = .83$$

f. Calculate the F test to determine if a significant proportion of variation in performance can be explained by anxiety. Use $\alpha = .05$.

| source | df | SS | MS | F |
|--------|----|-------|-------|-------|
| Reg | 1 | 16.95 | 16.95 | 24.41 |
| error | 8 | 5.55 | .694 | |
| total | 9 | 22.5 | | |

$$F(1, 8) = 24.41, p < .05.$$

g. Calculate the T-test to determine if the regression coefficient differs significantly from zero. use $\alpha = .05$.

$$t(8) = 4.94, p < .05.$$

2. Below is data concerning marriage satisfaction scores (on a scale of 1-10) and the perceived level of household responsibilities (on a scale of 0-100) for females.

| responsibility | satisfaction |
|----------------|--------------|
| 50 | 8 |
| 65 | 8 |
| 80 | 6 |
| 85 | 6 |
| 90 | 4 |
| 85 | 7 |

a. Compute the correlation between responsibility and satisfaction. Report whether that correlation is significant at $\alpha = .05$, and report in APA format.
 $r = -.80, p < .05$.

b. Calculate the regression equation for this data.
 $y' = 12.49 - .08x$

c. What satisfaction score would you predict for someone with a responsibility score of 40?
 If $x = 40$, then $y' = 9.33$

d. What proportion of variation in satisfaction can be explained by perceived responsibility for household duties?
 $r^2 = .64$

e. What is the standard error of estimate for this data?
 $S_{y.x} = 1.02$

f. Calculate the F test to determine if a significant proportion of variation in satisfaction can be explained by responsibility. Use $\alpha = .05$.

| source | df | SS | MS | F |
|--------|----|------|------|------|
| Reg | 1 | 7.31 | 7.31 | 6.97 |
| error | 4 | 4.19 | 1.05 | |
| total | 5 | 11.5 | | |

$F(1, 4) = 6.97, p > .05$.

g. Calculate the T-test to determine if the regression coefficient differs significantly from zero. use $\alpha = .05$.

$t(4) = -2.64, p > .05$.