

Exercises :

22.

a. How many Apartment building were in the sample?

$$n_T = \text{sample size} = 8 + 1 = 9.$$

b. Write the estimated regression equation?

$$y = 20 + 7.21x.$$

c. What is the value of S_{b1} ?

$$S_{b1} = 1.3626$$

d. Use the F-test to test the significant of the relationship at $\alpha = 0.05$?

give by table : $SSR = 41587.3$ and $df_1 = 1$

$$SST = 51984.1$$

we find $SSE = SST - SSR = 10396.8$ and $df_2 = 7 \rightarrow MSE = 1485.3$

$$\text{Now } F = \frac{MSR}{MSE} = \frac{41587.3}{1485.3} = 28$$

$\rightarrow F_{0.05}$ with $df = 1$ and $df = 7$

$F_{\alpha} = 5.59 \rightarrow F > F_{\alpha}$ So Reject H_0 ($\alpha = 0.05$).

e. estimate y since $x = 50.000$?

$$y = 20 + 7.21(50)$$

$$y = \underline{380.5} \quad \checkmark$$

23:

a. write the estimated regression equation?

$$y = 6.1092 + 0.8951 X.$$

b. use t-test. $\alpha = 0.05$.

$$t = \frac{b_1}{s_{b_1}} = \frac{0.8951}{0.149} = 6.01$$

$t_{\frac{\alpha}{2}}$ with $df = n - 2$ $n = 10$

$t_{0.025}$ with $df = 8$ (By t-table)

$$t_{0.025} = 1.86.$$

So $|t| \geq t_{\frac{\alpha}{2}}$ so we reject H_0 ($\beta_1 \neq 0$) ($\alpha = 0.05$).

c. $y(25)$??

$$y = 6.1092 + 0.8951(25)$$

$$= \underline{\underline{28.49}}$$

24.

a. Write the estimated regression equation.

$$y = 80 + 50X.$$

b. How many branch offices were involved in the study?

$$n_{\text{Total}} = 29 + 1 = 30$$

c. Compute F statistic $\alpha = 0.05$.

$$F = \frac{MSR}{MSE} = \frac{6828.6}{82.1} = 83.17$$

F_{α} with $df_1 = 1$ and $df_2 = 28$

$$F_{0.05} = 4.02$$

$F > F_{\alpha}$ so we Reject $H_0 (\beta_1 = 0)$ ($\alpha = 0.05$)

d. $y(12)$:

$$\begin{aligned} y(12) &= 80 + 50(12) \\ &= 680 \end{aligned}$$