

Starter 4/8

p. 764 #21, 22, 23, 25, 26

12.1c Significance Tests for Slope $H_0: \beta =$ hypothesized value $H_a: \beta \begin{matrix} \neq \\ < \\ > \end{matrix}$ hypothesized value

0 if answering question:
Is there a linear relationship?

Method: t test for the slopetest statistic = $\frac{\text{Statistic} - \text{parameter}}{\text{st. dev. of statistic}}$

$$t = \frac{b - \beta_0}{SE_b}$$

$$df = n - 2$$

on calc:

enter in 2 lists (X & Y)

stat → tests → G: LinReg TInt

F: LinReg Ttest

← not on 83's

12.1c Example

b)

$$\widehat{\text{tip(dollars)}} = 4.535 + 0.03(\text{length of stay})$$

d) Step 1

$$H_0: \beta = 0$$

$$H_a: \beta > 0$$

$$\alpha = 0.05$$

β is the slope of the true regression line relating tip amount to length of stay

Step 2 Use a t test for slope

Conditions

Linear - scatterplot shows a linear pattern

Independent - there are more than 20 receipts

Normal - Normal probability plot is linear

Equal Variance - The residual plot is equally scattered

Random - A random sample of receipts was collected.

Step 3

$$df = 12 - 2 = 10$$

$$T = 1.23 \longrightarrow \text{tcdf}(1.23, \infty, 10)$$

$$P\text{-val} = 0.123 \longleftarrow$$

$$= \frac{.247}{2}$$

Step 4

Since our p-val. (.123) is greater than $\alpha(.05)$ We fail to reject H_0 . We cannot conclude that the longer a customer stays the higher tip they pay.