

$x, y \leftarrow \text{response}$

Application

$$y = \underbrace{\beta_0}_{\text{intercept}} + \underbrace{\beta_1 x}_{\text{slope}} + \underbrace{\epsilon}_{\text{measurement error}}$$

Theory

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x$$

Practice

Example cars

$$\hat{\text{dist}} = -17.579 + 3.932 \times \text{speed}$$

$$\hat{\beta}_0 \quad \hat{\beta}_1$$

$$3.9324 - (2)(.4115) \leq \beta_1 \leq 3.9324 + (2)(.4115)$$

$$0 < 3.1014 \leq \beta_1 \leq 4.7674$$

$$\hat{y} = 7.277 - (.3560)(Dose)$$

$$-.3560 - (2)(.2007) \leq \beta_1 \leq -.3560 + 2(.2007)$$

$$-.7574 \leq \beta_1 \leq .0454$$

$$\left[\begin{array}{l} H_0: \beta_1 = 0 \text{ vs.} \\ H_a: \beta_1 < 0 \end{array} \right]$$