$H_0: \beta_1 = 0 \quad H_1: \beta_1 \neq 0.$

$$tStat = \frac{\text{estimate} - \text{hypothesised value}}{SE} \quad (\text{正负不用管}).$$

$SE = \sqrt{Var(X)}$

Number of observations = Error degrees of freedom − row

$tStat_{(\frac{pValue}{2})}$ (Error degrees of freedom) ⇒ pValue.

confidence interval

$$\text{Estimate} \pm tStat_{(1-\frac{\alpha}{2})}(\text{Error degrees of freedom}) \times SE$$

---

residual = observed − (mX + C)

⇒ Let β_1 be the ~~true~~ slope ~~for~~ in the line ~~relating~~ relationship between X:name and Y:name ~~X:name to mean Y:name~~

Let β_0 be the mean Y:name when X:name = 0

The sum of the residuals is zero

RMSE = Root Mean Squared Error

$$\begin{bmatrix} 1 & X \end{bmatrix} \begin{bmatrix} a & b \\ b & c \end{bmatrix} \begin{bmatrix} 1 \\ X \end{bmatrix} \Rightarrow S^2 = a + 2bX + cX^2$$

条件

$$(mX + C) \pm t_{(1-\frac{\alpha}{2})}(\text{Error degrees}) \sqrt{S^2} \cdot \cancel{RMSE}$$

$a = (SE \text{ of intercept})^2$

$c = (SE \text{ of slope})^2$

$$R\text{-squared} = 1 - \frac{\text{Error degrees of freedom} \times (RMSE)^2}{(\text{Number of observations} - 1) \times Var(\text{函数名})}.$$