

If $(1-\alpha)\%$ CI does not contain a_j , we can reject $H_0: \beta_j = a_j$ at $\alpha\%$ significance level.

Proof:

either $a_j > \hat{\beta}_j + c \cdot \text{se}(\hat{\beta}_j)$

$$\Leftrightarrow \frac{a_j - \hat{\beta}_j}{\text{se}(\hat{\beta}_j)} > c$$

or $a_j < \hat{\beta}_j - c \cdot \text{se}(\hat{\beta}_j)$

$$\Leftrightarrow \frac{a_j - \hat{\beta}_j}{\text{se}(\hat{\beta}_j)} < -c$$

$$\left. \begin{array}{l} \frac{a_j - \hat{\beta}_j}{\text{se}(\hat{\beta}_j)} > c \\ \text{or} \\ \frac{a_j - \hat{\beta}_j}{\text{se}(\hat{\beta}_j)} < -c \end{array} \right\} \Rightarrow \left| \frac{a_j - \hat{\beta}_j}{\text{se}(\hat{\beta}_j)} \right| > c$$