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Monday, September 13, 2021 9:32 AM

Section 1

MANE 6313

Subsection 1

Week 3, Module G

Student Learning Outcome

Analyze simple comparative experiments and experiments with a single factor.

Module Learning Outcome

Unequal
Variance

Evaluate the Box-Cox Transformation for non-homoskedastic data.

Box-Cox Method

- Power transformation used to stabilize variance

$$y^* = y^\lambda$$

- Computational formula

$$y^{(\lambda)} = \begin{cases} \frac{y^\lambda - 1}{\lambda \dot{y}^{\lambda-1}} & \lambda \neq 0 \\ \dot{y} \ln y & \lambda = 0 \end{cases}$$

- Note $\dot{y}$ is the geometric mean and is computed by using

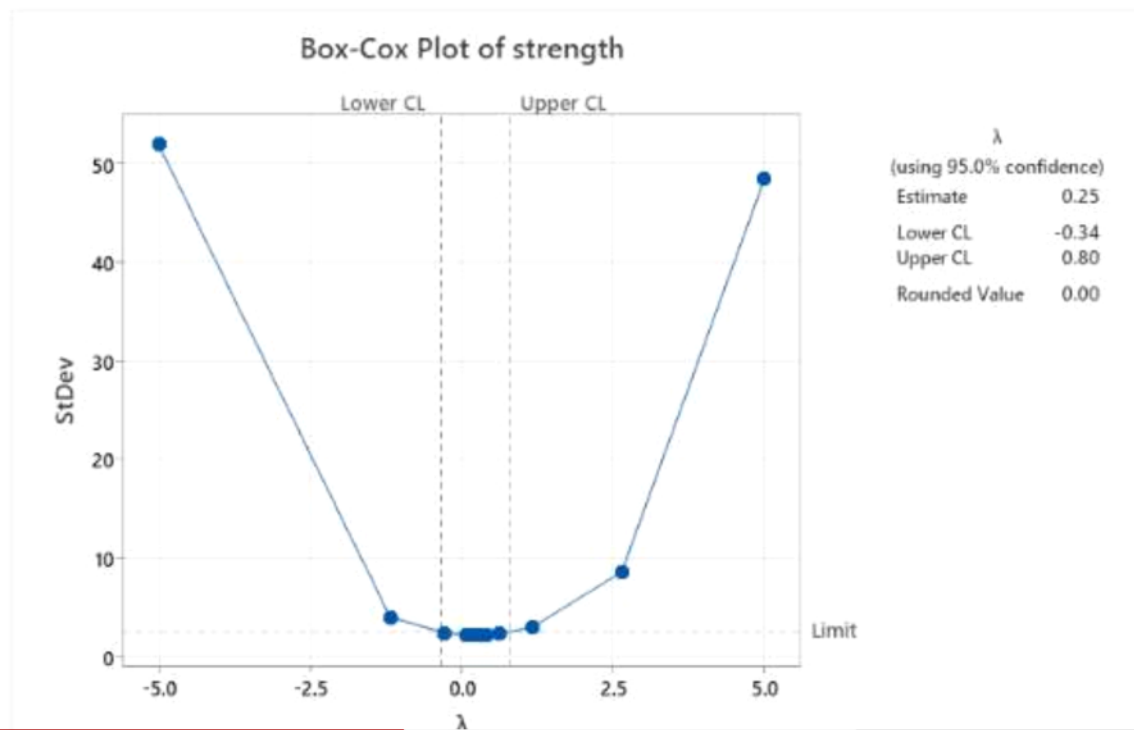
$$\dot{y} = \ln^{-1} \left[\frac{\sum \ln y}{n} \right]$$

Selecting Value of Lambda

- Plot λ versus $SS_E(\lambda)$
- Recommends to select simple values 0.5 versus 0.58 even though 0.58 is optimal

Minitab Output

Box-Cox Plot of strength



Minitab Demonstration

- Minitab: estimate λ
- Minitab: Box-Cox Transformation
- Minitab: Before/After Comparison