**Course Project Checkpoint 11**

For the purpose of this checkpoint, I assumed the weights of the penguins in this dataset were a population. Three species are represented in the `palmerpenguins` dataset: Adelie, Chinstrap, and Gentoo. This week’s analysis involved ANOVA analysis, followed by Tukey’s Honestly Significant Difference (HSD) in post-hoc testing. This week’s analysis did not include any dataset changes.

**ANOVA Results**

In analyzing the weight variation across different penguin species, the ANOVA analysis provides compelling evidence of significant differences. With an F-value of 343.6, the test yields a p-value of less than 0.001, affirming that the species variable significantly influences weight. The statistical analysis indicates that the species factor is a predominant contributor to the observed variance in weights among penguins, highlighting its importance in the study of their physical characteristics.

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**Tukey’s HSD Results**

The Tukey HSD test results suggest that there is a significant difference in the mean weight between Gentoo penguins and both other species (Adelie and Chinstrap), with Gentoos being heavier on average. However, there is no significant difference in the mean weight between Chinstrap and Adelie penguins. The confidence intervals for the significant differences do not include 0, which supports the finding of a significant difference, while the confidence interval for the non-significant difference does include 0.

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