

Lesson 11: Analysis of Variance

References

- Black, Chapter 11 Analysis of Variance and Design of Experiments (pp. 370-410)
- Kabakoff, Chapter 9 Analysis of Variance (pp. 212-221)
- Davies, Chapter 9.3 One-way ANOVA (pp. 218-223), Chapter 19 Analysis of Variance (pp. 435-449)
- Stowell, Chapter 6 Tabular Data (pp. 73-86), Chapter 10 Hypothesis Testing (pp. 144-146, 158)

Data set: `tableware.csv`

Variable Names:

1. TYPE: bowl, cass, dish, tray, plate
2. BOWL: Bowl (1) or not (0)
3. CASS: Casserole (1) or not (0)
4. DISH: Dish (1) or not (0)
5. TRAY: Tray (1) or not (0)
6. DIAM: Diameter of item, or equivalent (inches)
7. TIME: Grinding and polishing time (minutes)
8. PRICE: Retail price (\$)
9. RATE: Retail price divided by Time (\$ per minute)

Exercises:

- 1) Use the `tableware.csv` data to test the hypothesis that the mean RATE for the five levels of TYPE are equal. Test the hypothesis using a 0.05 significance level. Plot means and confidence intervals of RATE for each level of TYPE (Use the example given in Davies Chapter 9.3 One-way ANOVA (pp. 218-223)).
- 2) Use the `tableware.csv` data to test the hypothesis that the mean PRICE for the five levels of TYPE are equal. Test the hypothesis using a 0.05 significance level. Plot means and confidence intervals of PRICE for each level of TYPE (Use the example given in Davies Chapter 9.3 One-way ANOVA (pp. 218-223)).
- 3) Use the `hot_dogs.csv` data. Perform a one-way AOV by Type on Calories and also Sodium (Use the example given in Davies Chapter 9.3 One-way ANOVA (pp. 218-223)). Use Tukey's Honest Significant Difference Test if the F-test is significant. Generate boxplots.