Multiple Linear Regression and ANOVA as Linear Models

This week's lecture:

Slides

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Overview

This week we explore the concept of the general linear model as a unifying framework for statistical analysis. We'll see how many common statistical tests (t-tests, ANOVA, regression) are actually special cases of the same underlying linear model.

Understanding this unified perspective helps simplify statistical thinking and reveals the connections between techniques that are often taught separately. We'll apply these concepts to real-world datasets including HR analytics and fuel consumption data.

Key Topics

- The general linear model framework
- How t-tests, ANOVA, and regression are related
- Multiple regression with continuous and categorical predictors
- Interaction effects in multi-factor designs
- Practical applications and interpretation

Learning Materials

- Content Part 1: The General Linear Model as a Foundation
- Content Part 2: ANOVA as a Linear Model
- Content Part 3: More Tests as Linear Models

Required Readings

- Poldrack, *Statistical Thinking*, Chapter 10-11
- *Common statistical tests are linear models*. Jonas Kristoffer Lindeløv (2019).
- Bekes & Kezdi, *Data Analysis for Business, Economics, and Policy*, Chapter 8-9

Bibliography