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Week 10 Reading Questions

Model Selection

Q1: Why would we want a model selection criterion to penalize the number of parameters in a model?

We would want a model selection criterion to penalize the number of parameters in a model So that we can compare models next to each other to compare, to see which model fits the data the best, which includes seeing if we included the right predictors.

Interpreting a slope

Q2 (3 pts.): In 2 - 3 short paragraphs, describe the meaning of the slope parameter β_1 in the context of the relationship between the predictor variable, x, and the response variable y.

$$yi = \alpha + \beta_1 x_i + \epsilon$$

The slides state that "For each 1-unit change in x, we expect a β_1 change in the value of y (on average)." What I understood from this is that for every single numeric value whether positive or negative in the calculated value x, then there should be a change in the number in the average numeric value of the response variable, y. We can understand the rate of change in our response variable based on the increase or decrease of our x value, you can use the equation to create a model. The lm function in R does this for us.

Interpreting a coefficient table

Q3: Based on the model table, what is the base case water treatment?

The base case water treatment is the intercept which is 2.4

Q4: What is the average plant mass, in grams, for the **low** water treatment?

Adding one 'medium water treatment unit' increases the water mass by

How did you calculate this quantity?

$3.7 = 2.4 + 1 \times 1.3 + 0 \times 13.6$

Q5: What is the average plant mass, in grams, for the **medium** water treatment?

Adding one ‘medium water treatment unit’ increases the water mass by 1.3 grams, on average. So the average plan mass is 16g.

How did you calculate this quantity?

$16 = 2.4 + 0 \times 1.3 + 1 \times 13.6$

Coefficient Interpretations

Q6: Which of the following questions cannot be addressed with the model coefficient table? Select the correct answer or answers:

A. Is there a positive relationship between increased water availability and plant biomass accumulation?
B. Is water availability a significant predictor for plant biomass accumulation?
C. What is the average biomass of plants in the high water treatment?