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Week 10 Reading Questions

I did not work on these with anyone else

- **Q1 (1 pt.):** Why would we want a model selection criterion to penalize the number of parameters in a model?

Because the introduction of more parameters in a model will increase variability due to complexity and error, decreasing the efficacy of the model. Therefore, decreasing the degrees of freedom is necessary.

- **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 .

The meaning of the slope parameter of B in the context of the relationship between the predictor variable and the response is the magnitude. The magnitude of the parameter directly affects the magnitude of the slope and of the response variable.

For instance, if you were to increase the parameter of B from a 2 to a 4, that would correspond to a doubling of the magnitude of the response variable at that slope parameter.

- **Q3 (1 pt.):** Based on the model table, what is the *base case* water treatment?

The base case water treatment is "low" water treatment.

- **Q4 (2 pts.):** What is the average plant mass, in grams, for the **low** water treatment?
 - How did you calculate this quantity?

The average plant mass for the low treatment is 2.4 grams. I got this quantity because it would be the base case (or intercept)'s coefficient, which is represented by the "Estimate" column here.

- **Q5 (2 pts.):** What is the average plant mass, in grams, for the **medium** water treatment?
 - How did you calculate this quantity?

The average plant mass for the medium water treatment is 3.7 grams. I got this quantity by adding the 1.3 estimate to the base case value of 2.4, as the coefficients for the other treatments after the base case are represented as additions to the base case value.

- **Q6 (1 pt.):** 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?