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Week 12 Reading Questions

Q1.

When constructing a model, there is a tradeoff that occurs when we consider how many parameters, or variables, we want to incorporate. For example, imagine a study that examines the factors that affect employee salaries at a business. A simple model may only consider the effect that the employee’s degree has on their salary. In this model, we can easily interpret that employee with a doctorate would earn more than a masters degree, and one with a masters would earn more than an employee with a bachelor’s degree. However, this model does not account for all factors that could be affecting wage. In a more complicated model we could also consider the effects of gender and number of years worked at the business. While this model will give a more accurate output, it is harder to determine which variable has the greatest impact on salary.

Q2

Water & nitrogen

Q3

I would expect this plant to have a biomass accumulate of -1.7, which is equal to the intercept This is because since it is not being given water and nitrogen which would increase the biomass, and no phosphorous which would further decrease the biomass, we can interpret that the biomass accumulation would be equal to the intercept. We do not know the exact mass of the plant because the starting mass is not given

Q4

Plant biomass = -1.7 + 0.043 + 0.192 – 0.027 = -1.438

To obtain this calculation, I referred to how the question tells us that the amount of water, N, and P were randomized within a range of 3-30 ml, 1.1-42 mg, and 1.1-42 mg respectively per week. I interpreted this to mean that any amount of these resources would yield the exact response coefficients given in the table.

Q5

A simple linear regression requires 1 continuous predictor and 1 continuous response variable. However, a one-way ANOVA requires 1 *categorical* predictor, rather than continuous.

Q6

The deterministic components would be alpha and beta\*x

Q7

The stochastic component would be epsilon(residuals)