2.5: Multiple Linear Regression

Dr. Bean - Stat 5100

1. Please describe a scenario where using multiple predictors would be useful in predicting a single response variable.

2. True or False: It is possible to have a significant model F-test but yet have none of the individual t-tests for the beta coefficients be significant. Explain your reasoning.

3. With enough explanatory variables, I might be able to explain the variability in my response variable perfectly or almost perfectly. Is this desirable? Explain why or why not?

Suppose I have two regression models predicting the same Y variable with identical sum of squares errors and identical samples of the data. Model 1 has 4 explanatory variables and Model 2 has 8 explanatory variables. Based on this information:

4. Will the estimated variance of the residuals for these models be the same or different?

- **If different, which one will be greater?**

Please explain your reasoning.