

# Professor Notes About Linear Models Foundations Homework 1

- In the first question, a “menu item” is an individual, not a variable. Thus, it does not enter into the discussion about determining the type of analysis.
- In all examples in this class there will only ever be one response variable. In these questions, this is most evident in the fourth question. First, “the relationship between” is a type of analysis, not a variable. Thus, one of “hip girth” and “body weight” is the response variable (think y-axis) and the other is the explanatory variable (think x-axis). As these are both quantitative, this is some sort of regression. The relationship (i.e., regression) between these two is going to be compared between two groups; thus, “sex” is another explanatory variable.
- In question 5, the “number of snails” is categorical because groups were created 1, 2-5, or more than 5 individuals. The actual number of snails was not recorded.

## Analysis Types

1. This is a ***simple linear regression*** because both variables are quantitative (it is not clear which one is the response variable; though, it is likely number of calories).
2. This is a ***1-way ANOVA*** because the response variable (batting average) is quantitative and the explanatory variable (position) is categorical. Additionally, the means are being compared among different groups described by one factor variable.
3. This is a ***logistic regression*** because the response variable (pass (or not) on the first attempt) is categorical (binomial) and the explanatory variable (grade-point-average) is quantitative.
4. This is a ***indicator variable regression*** because the response variable (hip girth) is quantitative and one explanatory variable (body weight) is quantitative while the other explanatory variable (sex) is categorical. Additionally, the research is attempting to determine if a relationship between two quantitative variables differs between two groups.
5. This is a ***2-way ANOVA*** because the response variable (body temperature) is quantitative and the two explanatory variables (rock color and group size) are categorical.
6. This is a ***1-way ANOVA*** because the response variable (chick weight) is quantitative and the explanatory variable (feed supplement type) is categorical. Additionally, the means are being compared among different groups described by one factor variable.