Week 9 Reading Questions

1. Bolker describes custom-made analyses based on Maximum Likelihood, which often have a biological, ecological, or mechanistic justification.

He contrasts these with the familiar Least Squares, canned methods that we typically learn in our first statistics course.

Briefly (1 - 2 short paragraphs) describe at least two tradeoffs between the customized ML methods and the canned methods.

The customized Maximum Likelihood methods can be a little faster than “canned” approaches through the use of different algorithms that can speed up the process to save time. But using these ML methods can be new to some people so you will have to take the time to explain the methodology and models, so they understand what you are doing. You can also use software to compare models and hypotheses to see which is the best fit and better interprets your data. You can do all this without the software but it will leave more room for human error and it will save time.

1. Briefly (1 - 2 sentences) describe each of the four key assumptions of the general linear modeling approach.

We assume that the sampling and observations are independent and that the variance is constant, so the spread is always the same. The last two assumptions are that we have a fixed x and normality.

1. Explain how the normality assumption can be met in a general linear model, even if the response variable is not normally-distributed. (1 - 2 paragraphs)

When we look at normality we are focusing on the X (explanatory) variable. We want to make sure that the observations are normally distributed and we see the same X value repeated. The normality assumption applies to the residuals not the entire data set. Since it does not apply to the entire data set then the data may not be normally distributed. To make sure that the normality assumption is met we can use a histogram of residuals to make sure they are evenly distributed.