HOMEWORK #12 DUE NOV 28

Copters! One last time! Woo hoo!
http://sciences.ucf.edu/biology/jenkins/wp-content/uploads/sites/115/2014/04/copter-data-F16.txt

1. We analyzed our copter data before with lm, where we fussed with transformations but then assumed normality and homogeneity of variance. Analyze the same basic model again (time ~ length * fold + group + step), but use a glm (or glmmadmb) to permit other distributions. Explain which distribution is most plausible, and include a residuals plot to help justify your choice. [3 pts]

2. Now carry forward with that distribution model, but change the way you treat the effect of steps. We handled step as a covariate in the past (and above), which essentially assumes a common effect of step on all treatments (i.e., equal slopes among steps). But what happens if you handle it as a random effect? Compare that mixed effect model to the glm you chose above. Explain your result in terms of how the experiment worked. [2 pts]

<u>A new data set</u>: fertilizer.txt
http://sciences.ucf.edu/biology/jenkins/wp-content/uploads/sites/115/2014/04/carrots.txt

3. Six carrot plants (ID 1-6) were grown from seed hydroponically (i.e., in water) that had fertilizer added or not (control). Thus N = 12, despite 60 rows of data. Roots of each plant were measured (cm) for length every two weeks for 10 weeks, when the experiment ended. Analyze this simple repeated-measures experiment and tell us: did fertilizer significantly increase carrot root length? If so, how much did fertilizer increase carrot root length? [3 pts]

4. Now analyze the carrot experiment as if you had not realized this was a repeated-measures design – as if every week's measurements were independent samples of different plants. How would your answer to #3 above change? Why the difference? [2 pts.]