**Bio211 Biostatistics and Experimental Design Winter Term 2018**

**Lab 3 Plant Growth Part I**

**January 15, 2018**

Goals: Design a factorial experiment related to plant growth

Create a dataset we can use to explore more complicated statistical analyses

Protocol:

The class will perform this plant growth experiment in 5 groups. Each group will manipulate 2 effect variables in a fully factorial experimental design. At the end of the experiment, you will measure a response variable (either plant height, dry weight, or leaf number).

As a class, we will brainstorm variables that might have an effect on one of the three response variables. For example, amount of light, color of light, amount of water, salinity, fertilizer, plant density, etc. We will decide on 2 factors for each of the 5 groups and you can pick which group to work in.

Each group can use as many as 55 seedlings. There is a very wide range of plant heights at the start of the experiment so we will use a stratified random assignment of experimental units (plants) to treatments. To do this, line your groups plants up shortest to tallest and split them into three groups: short, middle, tall. To assign plants to groups, first assign a random short plant to each group, next assign a random middle sized plant to each group, last a random tall plant to each group. To assign more plants, start again with the small group, etc. etc.

You and your group are responsible for setting your experiment up and taking care of the plants for the duration of the experiment. The plants will live in your experimental conditions for two weeks until January 29.

Plants need to receive 10ml of water daily. Organize yourself to make a watering schedule. Notepads will live with your plants wherever they are and will record when plants are watered.

**Each group must turn in answers one set of answers to the questions on the following page.**

Sample experimental design:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor 1 | | | |
| Factor 2 |  | Level 1 | Level 2 | Level 3 |
| Level 1 |  |  |  |
| Level 2 |  |  |  |
| Level 3 |  |  |  |

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Group members:

Scientific question:

Hypothesis:

Null hypothesis:

Experimental design:

Treatment(s):

Replication:

Response variable(s):

Possible sources of error: