Quiz 5

Please answer these questions and submit your .RMD file and .PDF file to D2L.

Consider this quiz to be a proposal for your first project, which will be completed in the coming weeks.

1. Please submit a title of your project that includes: an objective, a meaningful and measurable response, levels of your treatment factor, and identified experimental units.
2. Will you be working in a group with any classmates? If so, who?

Here are some principles for the first project:

1. **Timeliness:** Your project will require a pilot study and an actual experiment, so all of the experimental runs should be able to be completed within a day or two.
2. **Data Collection:** The best case for data collection / analysis for this study will be a objective, continuous measurement: distance, temperature, height, etc.. However, if you do plan to collect subjective, Likert scale responses consider ratings on a 1 - 100 scale. (We won't be focusing on ordinal regression models for analyzing ordinal data.)
3. **Group Work:** You are encouraged to work in groups of up to size 3.
4. **Example Projects**:
    - What is the effect of salt on the boiling/freezing temperature of water?
    - Which paper towel brand is the strongest?
    - How do different air-pressure levels / (other bicycle characteristics) impact time to ride a course?
    - How does ski length / wax impact time to ski course?
    - How do yeti / nalgene / hydroflask containers differ at keeping drink hot or cold?
    - A few more projects are listed below from: 101 Ways to Design an Experiment, or Some Ideas About Teaching Design of Experiments by William G. Hunter

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variables: seat height (26, 30 inches), generator (off,on), tire pressure (40, 55 psi) *responses:* time to complete fixed course on bicycle and pulse rate at finish

variables: brand of popcorn (ordinary, gourmet), size of batch (1/3,2/3 cup), popcorn to oil ratio (low, high) *responses:* yield of popcorn

variables: amount of yeast, amount of sugar, liquid (milk, water), rise temperature, rise time *responses:* quality of bread, especially the total rise

variables: pan (aluminum, iron), burner on stove, cover for pan (no, yes) *responses:* time to boil water

variables: pack on back (no, yes), footwear (tennis shoes, boots), run (7, 14 flights of steps) *responses:* time required to run up steps and heartbeat at top

variables: oven temperature, length of heating, amount of water *responses:* height of cake

variables: temperature, humidity, rock salt *responses:* time to melt ice

variables: orientation of football, kick (ordinary, soccer style),steps taken before kick, shoe (soft, hard) *responses:* distance football was kicked

variables: mode (batch, time-sharing), job size, system utilization (low, high) *responses:* time to complete job on computer