The following problem is a modified version of an old M.S. exam problem from Purdue University

A student in Industrial Engineering is interested in studying a blind user's ability to understand images on the Web using a Tactile Image Enhancer. For her first experiment, she wants to determine what sort of image forms are easiest for a blind user to comprehend. She has selected 14 common Web images and obtained the image both in a **symbol** and **picture** form. She then simplified each image (both picture and symbol forms) by **1) edge detection** and **2) segmentation** (creating a total of 84 images). She is interested in studying the effects of image type (picture or symbol) and simplification level (original, edge detection, or segmentation) and will be measuring comprehension as the time (in seconds) it takes for the user to correctly identify the image once it is presented to the blind user.

It appears she will be able to recruit at most 20 students from the Indiana School for the Blind for this experiment. While these students have been trained to use the Tactile Image Enhancer, she expects a lot of subject to subject variability. During a visit, she expects a participant will be able to look at up to 20 images before fatiguing. She also thinks she has enough money to bring each subject in for two visits if this would be of any help in running the experiment.

Based on this information, your task is to describe how you would design the study (in a report no more than 5 pages). Make sure to describe all the design details, being very specific on how a participant's visit or visits would be run. Then describe how you would analyze the data giving details of the model.

After class on Wed February 21st, I will exchange reports for student critique. Since you reports will be turned in electronically, I will send each of you two reports and you have a week to critique using our rubric (Assignment #4). If you would like your report to be anonymous, electronically submit one without your name.

In addition, three or four of you will be selected to do a oral presentation of your report on February 21st. I will contact you before the end of the week if you are one of the lucky ones. This report can be no longer than 10 minutes and should highlight the key aspects of your proposed experimental design and eventual analysis.

Finally, you may have questions you'd like to ask the client prior to proposing your design. Please send these questions to me via email no later than Thursday 2/15 at 11:59PM. I will respond to you with answers by Friday 2/16 at 5:00 PM. No other questions will be answered after that point.