PSY 3330: Elementary Statistics for Behav. Sci.

Exam 2 will consist of both multiple choice questions and a few short answer questions. The MC questions will cover definitions, concepts, simple calculations, etc. Make sure and review the lecture slides to review the following definitions and concepts:

- How to use the standard normal table
- The distribution of sample means
- How to calculate standard error
- How sample size affects standard error
- The logic of null hypothesis testing
- Type I and Type II errors
- The difference between a 1-tailed and 2-tailed hypothesis test

Computational practice problems

1. For a normal population with $\mu = 40$ and $\sigma = 8$:
   (a) What is the probability of obtaining a sample mean less than 37 for a sample of size 16?
   (b) What is the probability of obtaining a sample mean greater than 37 for a sample of size 16?
   (c) What is the probability of obtaining a sample mean less than 37 for a sample of size 4?
2. Recent results suggest that children with ADHD also tend to watch more TV than children who are not diagnosed with the disorder. To examine this relationship, a researcher obtains a random sample of $n = 36$ children, 8 to 12 years old, who have been diagnosed with ADHD. Each child is asked to keep a journal recording how much time each day is spent watching TV. The average daily time for the sample is $\overline{x} = 4.9$ hours. It is known that the average time for the general population is $\mu = 4.1$ hours with $\sigma = 1.8$.
   (a) Are the data sufficient to conclude that children with ADHD watch significantly more TV than children without the disorder? Use a two-tailed test with $\alpha = 0.05$.
   (b) If the researcher had used a sample of $n = 9$ children and obtained the same sample mean, would the results be sufficient to reject H_0?

3. A researcher is testing the effectiveness of a new herbal supplement that claims to improve memory performance. A sample of $n = 25$ college students is obtained and each student takes the supplement daily for six weeks. At the end of the 6-week period, each student is given a standardized memory test and average score for the sample is $\overline{x} = 39$. For the general population of college students, the distribution of test scores is normal with a mean of $\mu = 35$ and $\sigma = 15$. Do students taking the supplement have significantly better memory scores? Use a one-tailed test with $\alpha = 0.05$.

4. Twenty-five women between the ages of 70 and 80 were randomly selected from the general population of women their age to take part in a special program to decrease reaction time (speed). After the course, the women had an average reaction time of 1.5 seconds. Assume that the mean reaction time for the general population of women of this age group is 1.8 with a standard deviation of 0.5 seconds. Did the course have a significant effect on reaction time? Use a one-tailed test with $\alpha = 0.01$