Instructions for Exam 2:

A) Complete the following problems using SPSS. Record responses in the spaces provided.
    a. Record responses in the spaces provided
        i. Add more space if needed
    b. Interpret all results at the .05 significance level
    c. Record statistical notation when appropriate
    d. Round to 2 decimal places
    e. DOUBLE-CHECK YOUR DATA ENTRY!

B) You may use your manual and class notes/recordings to help you.
    a. Make sure you answer every part of each question!

C) Save the file to your directory as …
    a. *[First Name] [Last Name] – Exam 2*
        i. *Example --> Shantal Taveras – Exam 1*
    b. Save the file multiple times to ensure you don't lose your progress!

D) Exams are due by Wednesday, November 3rd (11/03) at 11:59pm end of day
    a. You will lose 5 points for each day that they are late! So be prompt!

# Exam 2

**1. (35 points)** A fitness instructor is advertising that participation in her new biking routine is associated with better heath. She surveyed 10 clients and asked them how many minutes per week they participate in her biking routine and how many times they visit a doctor annually. Is there any association between how many minutes a person participates in biking in a week and how many times he/she visits the doctor in a year?

| Minutes of Biking | Doctor Visits |
|---|---|
| 65 | 3 |
| 95 | 1 |
| 105 | 1 |
| 55 | 2 |
| 45 | 3 |
| 125 | 0 |
| 155 | 1 |
| 25 | 3 |
| 85 | 2 |
| 65 | 2 |

A. What tests would you perform? Be as specific as possible. *(10 points)*

B. Write a sentence describing the association between minutes of biking and doctor visits (include statistical notation). *(10 points)*

C. Can you run a regression (yes or no)? *(5 points)*

D. If you biked for 75 minutes per week how many doctor visits would you expect to have? **Show your work for how you arrived at your answer to get full credit.** *(10 points)*

**2. (25 points)** A publisher of children's books is deciding which of two books to publish. The options are "The Thirsty Games" and "The Dog in the Shoe". They read a chapter of the books to two different age groups, one being elementary school students and the other being middle school students. They ask each participant to identify which book they preferred, and want to know if there are significant differences in preferences between the age groups. *(25 points)*

| Elementary School | Middle School |
|---|---|
| The Dog in the Shoe | The Dog in the Shoe |
| The Dog in the Shoe | The Thirsty Games |
| The Thirsty Games | The Thirsty Games |
| The Dog in the Shoe | The Dog in the Shoe |
| The Thirsty Games | The Dog in the Shoe |
| The Thirsty Games | The Dog in the Shoe |
| The Dog in the Shoe | The Dog in the Shoe |
| The Dog in the Shoe | The Thirsty Games |
| The Thirsty Games | The Thirsty Games |
| The Thirsty Games | The Dog in the Shoe |
| The Thirsty Games | The Dog in the Shoe |
| The Dog in the Shoe | The Dog in the Shoe |

A. What test would you perform? Be as specific as possible. *(5 points)*

B. Write a sentence describing if there was a significant association or not between age group and book preference (include statistical notation). *(10 points)*

C. What is the phi coefficient value, and is this a small, medium, or large effect size? *(10 points)*

**3. (40 points)** ADHD researchers want to study a new stimulant drug to determine whether it can increase attention span in young children. To test the effectiveness of this drug, a researcher selects a random sample of 8 children with ADHD and measures each child's attention span before and after taking the drug for one month. Attention span is rated from 1-10, where 10 represents the highest level of attention span. Determine whether the stimulant medication significantly increases attention span in young children with ADHD. *(40 points)*

| Participant | Before treatment | After treatment |
|---|---|---|
| 1 | 4 | 7 |
| 2 | 2 | 8 |
| 3 | 3 | 5 |
| 4 | 0 | 4 |
| 5 | 3 | 5 |
| 6 | 1 | 4 |
| 7 | 3 | 6 |
| 8 | 2 | 8 |

A. What statistical test should you use to evaluate if the stimulant medication significantly increases attention span? Be as specific as possible. *(10 points)*

B. What is the significance (p-value) of the test? Is this statistically significant? *(5 points)*

C. Write <u>one</u> sentence describing the overall result of the statistical analysis (hint: think overall group differences). *(10 points)*

D. Write <u>one</u> sentence describing the difference between the groups. *(10 points)*

E. Write <u>one</u> sentence in "plain English" that describes the results of this experiment. *(5 points)*

F. Graph the means and SEM for the groups (include all three titles and error bars). *(2 bonus points)*

## Extra Credit:

With what statistical analysis do we test for Levene's equality of variances? (*1 point)*

How do we interpret a significant Levene's test? *(1 point)*

How do we interpret a non-significant Levene's test? *(1 point)*