

## Exam 1 Review (100 points total)

### Midterm Exam: 5/7/26 11:00 AM – 12:50

You will have almost 2 hours to complete the test (please return by 12:50 PM via email), but the exam is designed to be approximately one hour in length. There are no restrictions on use of notes or books or other sources, but you will not likely have enough time to look up all of the answers. You must complete this exam on your own.

### Short Essay (40 points)

There will be 2 short 'essay' questions worth 20 points each. These are open-ended questions on definitions and concepts. Answers should be about 1 paragraph and *in your own words*. I will pick 2 of the following questions:

- Explain conceptually how simple regression summarizes the relationship between two variables and contrast this approach with how correlation summarizes the relationship. Describe the meaning of the intercept, unstandardized slope, and standardized slope in simple regression analysis. Be sure to state how the intercept relates to the mean and the special interpretation that the intercept and unstandardized slope have when the predictor is binary.
- There are two advantages that multiple regression has over simple regression. Describe these two advantages. How can multiple regression be helpful in goal of understanding causal relationships (assume cross-sectional data)? When are covariates useful and when are they not useful in a multiple regression?
- What are the three classifications of outliers? Name and describe conceptually one diagnostic index for each type of outlier. Discuss three of the possible remedies for outliers.
- Define multicollinearity and explain its consequences. According to lecture and your text, when is multicollinearity most likely to be a problem? What is a possible remedy for multicollinearity. When does multicollinearity arise when testing quadratic or interaction effects with regression and how specifically does it impact the results in those models?

### Multiple Choice (30 points)

There will be 15 multiple choice questions worth 2 points each. These may be on any of the assigned reading or the lecture material up to and including **5/5/26**. The purpose of these questions is to make sure you have read the material and learned the concepts from the text and class lecture.

### Interpretation of Results (30 points)

There will be two printout interpretation questions (15 pts each) that involve a write-up similar to those in the homework. These questions may include one or more of the following:

**Computations:** none

**Interpretation:** SPSS and R correlation, simple regression, and simultaneous multiple regression output; SPSS hierarchical regression output; intercept, standard error,  $R^2$ ; B;  $\beta$ ; t-test; F-test;  $R^2$ -change; F-change; drawing and labeling a Venn diagram based on regression output, regression analysis with categorical predictor(s) and ANCOVA.