Statistics 411/511
Homework 8
Due Tuesday, December 1 by midnight Pacific time

- **Instructions:** Upload homework to Gradescope via Canvas (access specific homework assignments from the Assignments link on the Canvas course page). Your file must be a pdf document. Please see the end of the syllabus for formatting guidelines.
- The problems are assigned from the **third edition** of the textbook. If you have another edition, consult the copy on reserve at the library website for the homework problems.
- **Academic Integrity** You are encouraged to *discuss* the homework with other students, but what you turn in must be your own work in your own words. **DO NOT** copy someone else's homework. You may share ideas and R code, but do not share R output or written language. The syllabus contains details and links to OSU's Student Conduct Code and procedure for reporting suspected academic misconduct.
- **Please assign pages when submitting to Gradescope.** See Gradescope help for instructions and a video. Papers without assigned pages will lose 0.5 points.

For this homework, use the data described in Exercise 28 of Chapter 7. This is `ex0728` in the `Sleuth3` R package.

1. Produce a scatterplot of Activity vs. Years with fitted regression line. Include R code and the plot. Does the linearity assumption appear to be met?

2. Estimate the regression of Activity on Years. Give the estimated regression equation with standard errors of the coefficients below the coefficients in parentheses, as at the bottom of page 187 in the *Sleuth* or as we did on page 9 of Outline 7 when we discussed it in lecture on November 23. Please include R code but not output.

3. Calculate 95% confidence intervals for the intercept and slope parameters of the regression equation. State the two intervals. Indicate which estimates the slope parameter and which estimates the intercept parameter. Statistical conclusions are not necessary for this question. Please include your R code but not output.

4. Write a statistical conclusion reporting the confidence interval for β_0 in question 3.

5. Calculate a 95% confidence interval for the mean neuronal activity index for string musicians with 15 years experience. Include R code and output, and write a statistical conclusion reporting this interval.

6. Calculate a 95% prediction interval for the neuronal activity index for a string musician with 15 years experience. Include R code and output, and write a statistical conclusion reporting this interval.