Math 8452, Homework #2. Due on 6/10/20 (Wed section) or 6/11/20 (Thu section).

Reading and videos:

- Watch the video (see Blackboard) on nonparametric prediction intervals.

- Read Section 3.1 on the signed rank test and Section 4.1 on the rank sum test.

- For next week, read Section 4.5 on relative efficiency.

- For next week, read Section 5.1 on the Ansari-Bradley test.

Problems to do:

1. (Not to turn in.) Given below are the lengths of 12 randomly selected issues of a statistics journal. Find an 80% prediction interval for the length of the next issue of the journal. What is the exact coverage probability for the prediction interval that you used?

   69 92 92 99 96 115 95 96 103 92 77 117

2. (To turn in.) Suppose that X_1, X_2, X_3 and Y_1, Y_2, Y_3 are two independent simple random samples from the same continuous distribution. If we use the interval $(X_{(1)}, X_{(3)})$ as a prediction interval for the median $Y_{(2)}$ of the second sample, what is the coverage probability?

3. (To turn in.) Using listing, find the null distribution of the signed rank statistic when the sample size is $n = 4$ and there are no ties. Is it possible to do a level-0.05 upper-tailed test? 可以吧，为什么不可以

4. (To turn in.) Using listing, find the null distribution of the permutation test statistic based on the mean pairwise difference when the data are as given in the table below. Note that we're doing a test based on the four pairwise differences. As in class, we assume symmetry.

   这题哟意思

Pair	X	Y
1	35	51
2	20	32
3	24	28
4	28	48

5. (To turn in.) Do problems 1 and 4 on page 54 in the textbook. Use the signed rank test, making sure to report your hypotheses, your p-value, and your conclusions in context. Using R is fine.

6. (To turn in.) Using listing, find the null distribution of the rank sum statistic when the sample sizes are $m = 5$ and $n = 2$. Using the null distribution, find the rejection region for an upper-tailed level-0.20 test. What is the exact α level for this test?

7. (Not to turn in.) Working by hand, do problem 1 on page 133 in the textbook.