LING82100: homework 3

(Due 3/11)

For this assignment you will perform three analyses using data from Casillas et al. 2015, a phonetic study of coronal obstruent voice onset times in English and Spanish. The TSV file `casillas.tsv`[1] contains the target data. For each data set, you will

- determine whether the data satisfies the normality assumptions of the *t*-test by
  - making QQ-plots using `qqnorm` and `qqline`,
  - computing skewness and excess kurtosis using the `skewness` and `kurtosis` functions, or
  - applying the Shapiro-Wilk test using the `shapiro.test` function.
- Then apply the appropriate two-sided test, either the *t*-test or the Wilcoxon (-Mann-Whitney) test using the `t.test` and `wilcox.test` functions.

What to turn in

For each data set, your report should include

- a brief summary of the results from your tests for the normality assumption;
- exactly which test was used (e.g., "two-sided, two-sample unequal-variance *t*-test"),
- the test statistic,
- the *p*-value, and
- significance at $\alpha = .05$.

If you use the *t*-test, also report

- the sample mean(s) and
- the 95% confidence interval for the mean(s).

And, if you use the Wilcoxon test, report the sample median(s).

[1] `http://wellformedness.com/courses/LING82100/Data/casillas.tsv`

Hints

- You will almost surely want to use the `subset` function.
- If the evidence for normality is mixed, just defend your choice.
- The `e1071` library provides `skewness` and `kurtosis` functions. You will have to install and load it before using it, however.

1 /d/

Test the null hypothesis that the population mean and/or median for /t/ (across both English and Spanish) is 0.

2 Spanish /t/

Test the null hypothesis that the population mean and/or median for Spanish /t/ is 0.

3 English coronal stops

Test the null hypothesis that there is no population difference between English /t/ and /d/.

References

Casillas, J. V., Y. Diaz, and M. Simonet. 2015. Acoustics of Spanish and English coronal stops. In *ICPhS 18*. Glasgow.