# STAT 477/577 - Technology Guide

## Module 2 - Section 7

## Measures of Agreement

Below is an explanation of the R commands and functions needed to calculate the Cohen's Kappa and weighted Cohen's Kappa estimates.

- **Entering Data**

  Data for the ratings from the two judges will be read from a `.csv` file. The data from lecture on ratings of student teachers are located in file `StudentTeacher.csv` in Canvas. First, we will read the data file into R.

```
teacher<- read.csv(file.choose(), header = T)
```

  Once you have read the data into R, you will need to set the levels of the categories for the two variables in the data table. The commands for the data on the ratings of student teachers are below.

```
teacher$Judge.1<- factor(teacher$Judge.1,
          levels = c("Authoritarian", "Democratic", "Permissive"))
teacher$Judge.2<- factor(teacher$Judge.2,
          levels = c("Authoritarian", "Democratic", "Permissive"))
```

- **Cohen's Kappa**

  Base R does not contain a function to calculate an estimate of Cohen's Kappa. Instead, we will need to use the function `kappa2` in the package `irr`. The output of the function includes the estimate and a test statistic and $p$-value for testing whether the estimate is significantly greater than 0. For the student teacher data, the command is:

```
kappa2(teacher)

##  Cohen's Kappa for 2 Raters (Weights: unweighted)
##
##  Subjects = 72
##    Raters = 2
##     Kappa = 0.362
##
##         z = 4.33
##   p-value = 1.5e-05
```

- **Weighted Cohen's Kappa**

  The function `kappa2` also has an option to calculate the weighted Cohen's Kappa estimate. To calculate weighted kappa using the squared weights discussed in lecture, the command is:

```r
kappa2(teacher, weight = c("squared"))
```

```
##  Cohen's Kappa for 2 Raters (Weights: squared)
##
##  Subjects = 72
##    Raters = 2
##     Kappa = 0.216
##
##         z = 1.85
##   p-value = 0.065
```