Calculating inter-rater reliability

```
library(psych)
library(tidyverse)
```

Cohen's Kappa is a measure of agreement between two raters. We're using it to asssess inter-rater reliability at both the title/abstract screening and the full-text screening stage.

Some notes:

- For each stage, we're using a combination of our studies found through database search and through citation searching
- We need to make our own agreement table and ratings lists because Covidence (the software we used for screening) currently does not have a way to manually remove duplicate studies, so we kept track of agreement numbers ourseles and removed duplicates from the yes/no counts.

Title/abstract screening phase

Expected total number of studies: 4030

```
agreement1 = tibble(
  my_rownames = c("A_yes", "A_no"),
  B_yes = c(93, 21),
  B_no = c(186, 3730)
) %>% column_to_rownames(., var = "my_rownames")

knitr::kable(agreement1)
```

	B_yes	B_no
A_yes	93	186
A_no	21	3730

```
frequency_list_for_repeating1 = c(agreement1["A_yes", "B_yes"],
                                  agreement1["A_yes", "B_no"],
                                  agreement1["A_no", "B_yes"],
                                  agreement1["A_no", "B_no"])

raterA1 = rep(c(1, 1, 0, 0), frequency_list_for_repeating1)
raterB1 = rep(c(1, 0, 1, 0), frequency_list_for_repeating1)

cohen.kappa(x = cbind(raterA1, raterB1))
```

```
## Call: cohen.kappa1(x = x, w = w, n.obs = n.obs, alpha = alpha, levels = levels)
```

```
##
## Cohen Kappa and Weighted Kappa correlation coefficients and confidence boundaries
##                 lower estimate upper
## unweighted kappa  0.39      0.45  0.51
## weighted kappa    0.39      0.45  0.51
##
##  Number of subjects = 4030
```

Full-text screening phase

Expected total number of studies: 136

```
agreement2 = tibble(
  my_rownames = c("A_yes", "A_no"),
  B_yes = c(42, 6),
  B_no = c(2, 86)
) %>% column_to_rownames(., var = "my_rownames")

knitr::kable(agreement2)
```

	B_yes	B_no
A_yes	42	2
A_no	6	86

```
frequency_list_for_repeating2 = c(agreement2["A_yes", "B_yes"],
                                  agreement2["A_yes", "B_no"],
                                  agreement2["A_no", "B_yes"],
                                  agreement2["A_no", "B_no"])

raterA2 = rep(c(1, 1, 0, 0), frequency_list_for_repeating2)
raterB2 = rep(c(1, 0, 1, 0), frequency_list_for_repeating2)

cohen.kappa(x = cbind(raterA2, raterB2))
```

```
## Call: cohen.kappa1(x = x, w = w, n.obs = n.obs, alpha = alpha, levels = levels)
##
## Cohen Kappa and Weighted Kappa correlation coefficients and confidence boundaries
##                 lower estimate upper
## unweighted kappa  0.78      0.87  0.96
## weighted kappa    0.78      0.87  0.96
##
##  Number of subjects = 136
```