Lab #8

# CTT and IRT

NOTE: Each question should be a separate chunk in **R-studio’s Rmarkdown or R notebook** and using Knitr, knit your work and the output into a word document that you will upload into Canvas.

* Start with packages “foreign”, “psych”, “mirt”, “FMP”, and “crayon”
* Load datasets social\_fact.sav, item\_analysis\_example.sav, and mmpi\_r.sav in R.

1. Using social\_fact.sav
   1. Compute the item difficulty, discrimination values and cronbach’s alpha for the CIC items using psych. Interpret the item/total correlations, the drop correlations, and other info given in the output.
   2. Compute Cronbach’s alpha “by hand”. First compute a covariance matrix, find the sum of the values, find the sum of the covariances, etc.
2. Using item\_analysis\_example.sav
   1. Compute the item difficulty and discrimination values.
   2. Compute Cronbach’s alpha.
   3. Create empirical ICCs for the first 5 items.
   4. Create restscore graphs for the first 5 items.
   5. Run a 1, 2 and 3 factor exploratory IRT analysis in mirt.
   6. Run a confirmatory unidimensional IRT model on just the first 5 items. Include irt coefficients, residuals, ICCs, IICs with SEs, and a test information function.
3. Using mmpi\_r.sav
   1. Compute the item difficulty and discrimination values.
   2. Compute Cronbach’s alpha.
   3. Create empirical ICCs for the first 5 items.
   4. Create restscore graphs for the first 5 items.
   5. Run a 1 to 5 factor exploratory IRT analysis in mirt.
   6. Run a confirmatory unidimensional IRT model on just the first 5 items. Include irt coefficients, residuals with LD tests, ICCs, IICs with SEs, and a test information function.
   7. Repeat “f” on all 24 items. Include irt coefficients, ICCs, IICs with SEs, and a test information function.