BACS - HW (Week 15)

This week, we are going to make SEM models using SEMinR, an R package created by students from previous years' BACS talent, and now increasingly used in institutions around the world!

```
install.packages("seminr")
library(seminr)
```

Overview of the package: https://cran.r-project.org/web/packages/seminr/vignettes/SEMinR.html
Details of functions available at: https://cran.r-project.org/web/packages/seminr/seminr.pdf

Please download the data file `security_data_sem.csv` from Canvas -- there might be differences in file from previous weeks. This file shows you results of a survey about website security.

We will create a model similar to the one we saw in class, with several important differences. We will have several new constructs, and also include a single-item construct.

Question 1) Composite Path Models using PLS-PM

a. Create a PLS path model using SEMinR, with all the following characteristics:
   i. Measurement model – all constructs are measured as *composites*:
      1. **Trust in website (TRUST)**: items TRST1 - TRST4
      2. **Perceived security of website (SEC)**: items PSEC1 - PSEC4
      3. **Reputation of website (REP)**: items PREP1 - PREP4
      4. **Investment in website (INV)**: items PINV1 - PINV3
      5. **Perception of privacy policies (POL)**: items PPSS1 - PPSS3
      6. **Familiarity with website (FAML)**: item FAML1
         (see the documentation of SEMinR for making single item constructs)
      7. Interaction between **REP** and **POL** (use orthogonalized product terms)
   ii. Structural Model – paths between constructs as shown in this causal model:
      REP + **INV** + **POL** + **FAML** + (**REP**×**POL**) → **SEC** → **TRUST**
b. Show us the following results in table or figure formats:
   i. Plot a figure of the estimated model
   ii. Weights and loadings of composites
   iii. Regression coefficients of paths between factors
   iv. Bootstrapped path coefficients: t-values, 95% CI

See question 2 on next page...

Question 2) Common-Factor Models using CB-SEM

a. Create a common factor model using SEMinR, with the following characteristics:
    i. Either respecify all the constructs as being `reflective()`, or use the `as.reflective()` function to convert your earlier measurement model to being entirely reflective.
    ii. Use the same structural model as before (you can just reuse it again!)
b. Show us the following results in table or figure formats
    i. Plot a figure of the estimated model (it will look different from your PLS model!)
    ii. Loadings of composites
    iii. Regression coefficients of paths between factors, and their p-values

We welcome your feedback on SEMinR -- please post questions on Canvas regarding accomplishing any tasks or suggestions to make it easier to use!