BACS - HW 15   106073401

Question 1) Path Models

a. Create a PLS path model using SEMinR, with the following characteristics:

    i.   All constructs are measured as *composites* this week:

        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)**: single-item FAML1

        (see the documentation of SEMinR for making single item constructs)

```
install.packages("seminr")
library(seminr)
sec<-read.csv("security_data.csv")

sec_mm <- constructs(
    composite("REP", multi_items("PREP", 1:4)),
    composite("INV", multi_items("PINV", 1:3)),
    composite("SEC", multi_items("PSEC", 1:4)),
    composite("TRUST", multi_items("TRST", 1:4)),
    composite("POL", multi_items("PPSS", 1:3)),
    composite("FAML", multi_items("FAML", 1))
    )
```

    ii.   Interaction between **REP** and **POL** (use orthogonalized product terms)

```
sec_intxn <- interactions(
    interaction_ortho("REP", "POL")
 )
```

    iii.   Structural paths between constructs (shown as causal models -- note direction of arrows):

REP + INV + POL + FAML + (REP x POL) → SEC → TRUST

```
sec_sm <- relationships(
    paths(from = c("REP","INV","POL","FAML","REP.POL"), to = "SEC"),
    paths(from = "SEC", to = "TRUST")
 )
```

b. Show us the following results in table of figure formats:

```
sec_pls <- estimate_pls(data = sec,
                        measurement_model = sec_mm,
                        interactions = sec_intxn,
                        structural_model = sec_sm)
sec_report <- summary(sec_pls)
```

    i.   Weights of composites

```
sec_report$weights
                  REP       INV       POL FAML      REP*POL        SEC     TRUST
PREP1       0.2150721 0.0000000 0.0000000    0  0.00000000 0.0000000 0.0000000
PREP2       0.3337367 0.0000000 0.0000000    0  0.00000000 0.0000000 0.0000000
PREP3       0.3492133 0.0000000 0.0000000    0  0.00000000 0.0000000 0.0000000
PREP4       0.2868746 0.0000000 0.0000000    0  0.00000000 0.0000000 0.0000000
PINV1       0.0000000 0.3633600 0.0000000    0  0.00000000 0.0000000 0.0000000
PINV2       0.0000000 0.3950425 0.0000000    0  0.00000000 0.0000000 0.0000000
PINV3       0.0000000 0.3584780 0.0000000    0  0.00000000 0.0000000 0.0000000
PPSS1       0.0000000 0.0000000 0.3603145    0  0.00000000 0.0000000 0.0000000
PPSS2       0.0000000 0.0000000 0.3947849    0  0.00000000 0.0000000 0.0000000
PPSS3       0.0000000 0.0000000 0.3673689    0  0.00000000 0.0000000 0.0000000
FAML1       0.0000000 0.0000000 0.0000000    1  0.00000000 0.0000000 0.0000000
PSEC1       0.0000000 0.0000000 0.0000000    0  0.00000000 0.2770568 0.0000000
PSEC2       0.0000000 0.0000000 0.0000000    0  0.00000000 0.3146606 0.0000000
PSEC3       0.0000000 0.0000000 0.0000000    0  0.00000000 0.3074358 0.0000000
PSEC4       0.0000000 0.0000000 0.0000000    0  0.00000000 0.2918910 0.0000000
TRST1       0.0000000 0.0000000 0.0000000    0  0.00000000 0.0000000 0.2821311
TRST2       0.0000000 0.0000000 0.0000000    0  0.00000000 0.0000000 0.2803746
TRST3       0.0000000 0.0000000 0.0000000    0  0.00000000 0.0000000 0.2855684
TRST4       0.0000000 0.0000000 0.0000000    0  0.00000000 0.0000000 0.2778795
PREP1*PPSS1 0.0000000 0.0000000 0.0000000    0  0.23898913 0.0000000 0.0000000
PREP1*PPSS2 0.0000000 0.0000000 0.0000000    0  0.03129423 0.0000000 0.0000000
PREP1*PPSS3 0.0000000 0.0000000 0.0000000    0  0.02116206 0.0000000 0.0000000
PREP2*PPSS1 0.0000000 0.0000000 0.0000000    0  0.04588805 0.0000000 0.0000000
PREP2*PPSS2 0.0000000 0.0000000 0.0000000    0 -0.10424727 0.0000000 0.0000000
PREP2*PPSS3 0.0000000 0.0000000 0.0000000    0 -0.22825027 0.0000000 0.0000000
PREP3*PPSS1 0.0000000 0.0000000 0.0000000    0 -0.34075397 0.0000000 0.0000000
PREP3*PPSS2 0.0000000 0.0000000 0.0000000    0  0.09485806 0.0000000 0.0000000
PREP3*PPSS3 0.0000000 0.0000000 0.0000000    0  0.10847300 0.0000000 0.0000000
PREP4*PPSS1 0.0000000 0.0000000 0.0000000    0  0.44302124 0.0000000 0.0000000
PREP4*PPSS2 0.0000000 0.0000000 0.0000000    0  0.38225273 0.0000000 0.0000000
PREP4*PPSS3 0.0000000 0.0000000 0.0000000    0  0.27138341 0.0000000 0.0000000
```

    ii.   Regression coefficients of paths between factors

```
sec_report$paths
           SEC TRUST
R^2      0.521 0.467
AdjR^2   0.515 0.466
REP      0.284    NA
INV      0.179    NA
POL      0.409    NA
FAML    -0.048    NA
REP*POL -0.120    NA
SEC         NA 0.683
```

iii.   Bootstrapped path coefficients: t-values, p-values (are any paths not significant at p=5% ?)

```
boot_pls <- bootstrap_model(sec_pls, nboot = 1000)
summary(boot_pls)
Bootstrapped resamples: 1000

Structural Path t-values:
          SEC   TRUST
REP      3.473      .
INV      2.320      .
POL      5.739      .
FAML     0.699      .
REP*POL  0.181      .
SEC          .  19.047

Structural Path p-values:
         SEC  TRUST
REP      0.001      .
INV      0.021      .
POL      0.000      .
FAML     0.485      .
REP*POL  0.857      .
SEC          .  0.000
```