Session 5 - AAE636 - Fall 2019

Group Exercise II

Exploring the relationship between Sleep and the Allocation of Time

We are going to do the group exercise of replicating one of the published papers together.

1. Generate Table 2:
   - what is the mean and S.D. of sleep and naps of all the respondents; men group; women group
   - what is the mean and S.D. of work time of all the respondents; men group; women group
   - what is the relationship of sleep and naps with work time?
2. Relationship between F-stats and t-stats for single linear regression and multiple linear regressions:
   - model 1. $slpnaps = \beta_1 * totwrk + \beta_0$, find out the F-stats and t-stats for `totwrk` and prove its relationship
   - model 2. $slpnaps = \beta_1 * totwrk + \beta_2 * educ + \beta_0$, find out the F-stats and t-stats for `totwrk`, is there any relationship between them?
3. Generate Table 3
   - model 3: $slpnaps = \beta_1 * totwrk + \beta_2 * marr + \beta_3 * yrsmarr + \beta_4 * age + \beta_5 * agesq + \beta_6 * educ + \beta_7 * male + \beta_8 * gdhlth + \beta_9 * yngkid + \beta_{10} * prot + \beta_{11} * black + \beta_0$
   - estimate the model for all the respondents; men; women separately.
   - why we would like to separate them into subgroups?
   - do you think all the signs of estimated coefficients reasonable? Explain.
   - compare the R^2 and adjusted R^2 of the three models
4. Hypothesis testing
   - F-test: $\beta_1 = \beta_2 = 0$ at 0.05 significance level
   - t-test: $\beta_1 = \beta_2$ at 0.05 significance level by rewriting your model
   - t-test: $\beta_1 = \beta_2$ at 0.05 significance level step by step BY HAND
   - F-test: $\beta_1 = \beta_2$ at 0.05 significance level, and what is the relationship between the F-test and t-test here?