Assignment 02

Your name

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library(ggplot2)  
library(kableExtra)  
library(psych)

##   
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':  
##   
## %+%, alpha

library(moments)

mydata <- read.csv("../data/mydata.csv")

# Question 0

sel\_data <- mydata[, c("record\_id", "redcap\_event\_name", "insomina\_severity")]  
  
  
mydata2\_wide <- reshape(sel\_data,  
 timevar = "redcap\_event\_name",  
 idvar = "record\_id",  
 direction = "wide")  
  
mydata2 <- mydata2\_wide[complete.cases(mydata2\_wide), ]

# Residualized Gain Scores

## Write out the equation for the residualized gain model.

## Run the model for pairs of consecutive occasions (T1 and T2; T2 and T3) and save the residualized gain scores

## Create a table summarizing results of the models

|  | (1) / Est. | (1) / 2.5 % | (1) / 97.5 % | (1) / S.E. | (1) / t | (1) / p |
| --- | --- | --- | --- | --- | --- | --- |
| (Intercept) | 0.242 | -3.398 | 3.882 | 1.845 | 0.131 | 0.896 |
| insomina\_severity.1 | 0.627\*\*\* | 0.442 | 0.811 | 0.094 | 6.693 | <0.001 |
| R2 | 0.192 |  |  |  |  |  |

|  | (1) / Est. | (1) / 2.5 % | (1) / 97.5 % | (1) / S.E. | (1) / t | (1) / p |
| --- | --- | --- | --- | --- | --- | --- |
| (Intercept) | 2.241\*\*\* | 0.932 | 3.549 | 0.663 | 3.377 | <0.001 |
| insomina\_severity.2 | 0.808\*\*\* | 0.712 | 0.904 | 0.049 | 16.596 | <0.001 |
| R2 | 0.593 |  |  |  |  |  |

## Summary Statistics for the residualized gain scores

Residualized gain scores for T2 - T1

vars

n

mean

sd

median

trimmed

mad

min

max

range

skew

kurtosis

se

X1

1

191

0

5.3

0.5

0.1

5.5

-13.3

13.2

26.5

-0.2

-0.4

0.4

Residualized gain scores for T3 - T2

vars

n

mean

sd

median

trimmed

mad

min

max

range

skew

kurtosis

se

X1

1

191

0

3.9

0.2

0.1

3.4

-10.2

10.5

20.7

-0.2

-0.1

0.3

# Trend Scores

## Equations

## 1 2  
## [1,] -0.5661385 0.5883484  
## [2,] -0.2264554 -0.7844645  
## [3,] 0.7925939 0.1961161  
## attr(,"coefs")  
## attr(,"coefs")$alpha  
## [1] 2.500000 3.846154  
##   
## attr(,"coefs")$norm2  
## [1] 1.00000 3.00000 19.50000 28.03846  
##   
## attr(,"degree")  
## [1] 1 2  
## attr(,"class")  
## [1] "poly" "matrix"

## Compute the linear and quadratic trend scores for your data.

# Coefficients for linear and quadratic trends  
linear <- c(-0.679, -0.226, 0.793)  
quadratic <- c(0.588, -0.784, 0.196)  
  
  
mydata2$linear\_trend <- with(mydata2,  
 insomina\_severity.1 \* linear[1] +  
 insomina\_severity.2 \* linear[2] +  
 insomina\_severity.3 \* linear[3]  
)  
  
mydata2$quadratic\_trend <- with(mydata2,  
 insomina\_severity.1 \* quadratic[1] +  
 insomina\_severity.2 \* quadratic[2] +  
 insomina\_severity.3 \* quadratic[3]  
)

vars

n

mean

sd

median

trimmed

mad

min

max

range

skew

kurtosis

se

Time1

1

191

19.3

4.1

19.0

19.3

4.4

9.0

28.0

19.0

-0.1

-0.6

0.3

Time2

2

191

12.3

5.8

12.0

12.2

5.9

0.0

28.0

28.0

0.1

-0.4

0.4

Time3

3

191

12.2

6.1

12.0

12.0

7.4

1.0

28.0

27.0

0.2

-0.7

0.4

Linear

4

191

-6.2

3.6

-5.5

-6.1

3.7

-15.6

2.0

17.6

-0.3

-0.4

0.3

Quadratic

5

191

4.1

3.6

3.7

3.9

4.1

-3.5

13.5

17.1

0.4

-0.5

0.3

Time1

Time2

Time3

Linear

Quadratic

Time1

1.00

0.44

0.51

-0.25

0.28

Time2

0.44

1.00

0.77

0.34

-0.72

Time3

0.51

0.77

1.00

0.68

-0.31

Linear

-0.25

0.34

0.68

1.00

-0.37

Quadratic

0.28

-0.72

-0.31

-0.37

1.00

# Individual Curves

## Write out the equation for obtaining the individual curve.

## Compute the individual curves parameters (Intercept and Slope) for your data

mydata2\_long <- reshape(mydata2,  
 varying = list(c("insomina\_severity.1", "insomina\_severity.2", "insomina\_severity.3")),  
 v.names = "insomina\_severity",  
 timevar = "time",  
 times = c(1, 2, 3),  
 idvar = "record\_id",  
 direction = "long")  
  
  
istats <- data.frame(id=unique(mydata2\_long$record\_id),  
 iintercept=rep(NA,length(unique(mydata2\_long$record\_id))),  
 islope=rep(NA,length(unique(mydata2\_long$record\_id))))  
  
# run individual regressions  
for (i in unique(mydata2\_long$record\_id)){  
 pos <- which(istats$id == i)  
 datai <- mydata2\_long[which(mydata2\_long$record\_id == i),] # subset data for each individual  
  
 istats$iintercept[pos] <- coefficients(lm(insomina\_severity~time,data=datai))[1]  
 istats$islope[pos] <- coefficients(lm(insomina\_severity~time,data=datai))[2]  
 rm(datai)  
}

## Parameter Mean SD  
## iintercept Intercept 21.68 4.96  
## islope Slope -3.54 2.69

##   
## Correlation between intercept and slope: -0.61

## Plot for predicted curves

