

# Analysis code: part 2

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.0.3
```

```
##  
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':  
##  
##   filter, lag
```

```
## The following objects are masked from 'package:base':  
##  
##   intersect, setdiff, setequal, union
```

```
library(psych)
```

```
## Warning: package 'psych' was built under R version 4.0.3
```

```
df <- read.csv("Data.csv")
```

```
# Model 1  
lm1 = lm(PSQI ~ Weight + Height + Melatonin_before + Melatonin_after + Latency_Efficiency +  
          Activity_medium + Activity_large_screen_usage +  
          Actigraph_X_mean + Actigraph_Z_mean,  
          data = df)  
summary(lm1)
```

```
##
## Call:
## lm(formula = PSQI ~ Weight + Height + Melatonin_before + Melatonin_after +
##      Latency_Efficiency + Activity_medium + Activity_large_screen_usage +
##      Actigraph_X_mean + Actigraph_Z_mean, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.4089 -0.6383  0.2520  0.8431  2.8293
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -3.471e+01  1.787e+01  -1.942   0.0759 .
## Weight        -1.326e-01  7.110e-02  -1.865   0.0868 .
## Height         2.570e-01  1.080e-01   2.380   0.0348 *
## Melatonin_before  1.595e+08  8.386e+07   1.901   0.0815 .
## Melatonin_after  6.769e+07  7.733e+07   0.875   0.3986
## Latency_Efficiency -9.920e-02  8.032e-02  -1.235   0.2404
## Activity_medium  -4.003e-02  2.646e-02  -1.513   0.1563
## Activity_large_screen_usage 4.737e-02  4.512e-02   1.050   0.3145
## Actigraph_X_mean  2.006e+00  7.670e-01   2.616   0.0226 *
## Actigraph_Z_mean  -1.182e+00  4.762e-01  -2.481   0.0289 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.749 on 12 degrees of freedom
## Multiple R-squared:  0.5567, Adjusted R-squared:  0.2242
## F-statistic: 1.674 on 9 and 12 DF,  p-value: 0.1998
```

```
# Model 2
# (0.7609064488830729, ('Height', 'Melatonin_before', 'Total_minutes_in_bed', 'RR', 'Activity_medium', 'Activity_smoking', 'Actigraph_X_mean'))
lm2 = lm(PSQI ~ Height + Melatonin_before + Total_minutes_in_bed + RR + Activity_medium + Activity_smoking + Actigraph_X_mean, data = df)
summary(lm2)
```

```
##
## Call:
## lm(formula = PSQI ~ Height + Melatonin_before + Total_minutes_in_bed +
##      RR + Activity_medium + Activity_smoking + Actigraph_X_mean,
##      data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.0446 -0.3444  0.1257  0.6721  1.5371
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -5.988e+00  6.327e+00  -0.946  0.36001
## Height         7.643e-02  3.389e-02   2.255  0.04065 *
## Melatonin_before 1.628e+08  4.470e+07   3.641  0.00267 **
## Total_minutes_in_bed 1.871e-02  3.450e-03   5.422 8.99e-05 ***
## RR            -1.988e+01  4.899e+00  -4.057  0.00118 **
## Activity_medium -1.334e-02  9.953e-03  -1.341  0.20141
## Activity_smoking 1.990e-02  1.702e-02   1.169  0.26186
## Actigraph_X_mean 3.262e-01  9.091e-02   3.587  0.00297 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.189 on 14 degrees of freedom
## Multiple R-squared:  0.7609, Adjusted R-squared:  0.6414
## F-statistic: 6.365 on 7 and 14 DF,  p-value: 0.001684
```

```
# Model 3
#(0.812989235803329, ('Age', 'Weight', 'Melatonin_before', 'Total_minutes_in_bed', 'RR', 'Activity_heavy', 'Actigraph_X_mean', 'Steps_mean'))
lm3 = lm(PSQI ~ Age + Weight + Melatonin_before + Total_minutes_in_bed + RR + Activity_heavy + Actigraph_X_mean + Steps_mean, data = df)
summary(lm3)
```

```
##
## Call:
## lm(formula = PSQI ~ Age + Weight + Melatonin_before + Total_minutes_in_bed +
##      RR + Activity_heavy + Actigraph_X_mean + Steps_mean, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.9576 -0.5781  0.0352  0.5899  1.8804
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -6.128e+00  5.017e+00  -1.221 0.243653
## Age            3.145e-01  1.269e-01   2.478 0.027711 *
## Weight         1.042e-01  2.960e-02   3.522 0.003754 **
## Melatonin_before 1.551e+08  4.132e+07   3.755 0.002405 **
## Total_minutes_in_bed 2.297e-02  3.709e-03   6.192 3.26e-05 ***
## RR            -2.322e+01  4.803e+00  -4.836 0.000325 ***
## Activity_heavy  1.835e-02  9.223e-03   1.990 0.068034 .
## Actigraph_X_mean 6.097e-01  2.238e-01   2.724 0.017375 *
## Steps_mean     -4.263e+01  1.795e+01  -2.374 0.033657 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.091 on 13 degrees of freedom
## Multiple R-squared:  0.813, Adjusted R-squared:  0.6979
## F-statistic: 7.064 on 8 and 13 DF,  p-value: 0.001101
```

#### # Model 4

```
lm4 = lm(PSQI ~ Age+ Weight+ Melatonin_before+ Latency_Efficiency+ Total_minutes_in_bed+ RR+ Act
ivity_heavy+ Actigraph_X_mean+ Steps_mean, data = df)
summary(lm4)
```

```
##
## Call:
## lm(formula = PSQI ~ Age + Weight + Melatonin_before + Latency_Efficiency +
##      Total_minutes_in_bed + RR + Activity_heavy + Actigraph_X_mean +
##      Steps_mean, data = df)
##
## Residuals:
##      Min        1Q    Median        3Q        Max
## -1.8768 -0.4201  0.1305  0.5423  1.7599
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -2.972e+00  5.751e+00  -0.517  0.61462
## Age            3.670e-01  1.347e-01   2.724  0.01848 *
## Weight         1.013e-01  2.949e-02   3.436  0.00493 **
## Melatonin_before 1.483e+08  4.147e+07   3.576  0.00381 **
## Latency_Efficiency -4.961e-02  4.524e-02  -1.096  0.29441
## Total_minutes_in_bed 2.354e-02  3.718e-03   6.332 3.76e-05 ***
## RR            -2.399e+01  4.816e+00  -4.980  0.00032 ***
## Activity_heavy  1.814e-02  9.154e-03   1.981  0.07095 .
## Actigraph_X_mean  7.515e-01  2.570e-01   2.924  0.01274 *
## Steps_mean     -5.388e+01  2.056e+01  -2.621  0.02236 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.083 on 12 degrees of freedom
## Multiple R-squared:  0.83, Adjusted R-squared:  0.7025
## F-statistic: 6.511 on 9 and 12 DF, p-value: 0.001886
```