Chapter 2 - The Simple Regression Model

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```
library(wooldridge)
library(dplyr)
library(lmreg)
```

Exercise 2.3

Upload of database

```
data3<-wooldridge::sleep75

attach(sleep75)

View(data3)
```

Use the data in SLEEP75.RAW from Biddle and Hamermesh (1990) to study whether there is a tradeoff between the time spent sleeping per week and the time spent in paid work. We could use either variable as the dependent variable. For concreteness, estimate the model

$$sleep = \beta_0 + \beta_1 totwork + \varepsilon$$

where sleep is minutes spent sleeping at night per week and totwrk is total minutes worked during the week.

(i) Report your results in equation form along with the number of observations and R^2. What does the intercept in this equation mean?

```
lm1<-lm(sleep~totwrk, data=sleep75)

summary(lm1)
```

```
##
## Call:
## lm(formula = sleep ~ totwrk, data = sleep75)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2429.94  -240.25     4.91   250.53  1339.72
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) 3586.37695   38.91243  92.165   <2e-16 ***
## totwrk        -0.15075    0.01674  -9.005   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 421.1 on 704 degrees of freedom
## Multiple R-squared:  0.1033, Adjusted R-squared:  0.102
## F-statistic: 81.09 on 1 and 704 DF,  p-value: < 2.2e-16
```

There's 706 observations in the sample. The intercept is $\beta_0 = 3586.37$ and coefficient $\beta_1 = -0.15$.

The $R^2 = 0.103$ which means that the variability of variable $sleep$ is just 10.3% explaneid by the $totwrk$ variable.

The intercept represents the total hours of sleep per week if $totwork = 0$. Hence, in this case, would be equal a $\beta_0 = 3586.37$ minutes of sleep.

(ii) If totwrk increases by 2 hours, by how much is sleep estimated to fall? Do you find this to be a large effect?

If $totwrk$ increase by 2 hours, then

$$sleep = 3586.37 - 0.15 \times 2$$

$$sleep = 3586.07$$

The effect on reduction in the minutes of sleep is very low.