STOR 455 Homework #9 Part 1

Inference for Regression Slope/Correlation

library(readr)  
SleepStudy <- read\_csv("https://raw.githubusercontent.com/JA-McLean/STOR455/master/data/SleepStudy.csv")

## Rows: 253 Columns: 27

## -- Column specification --------------------------------------------------------  
## Delimiter: ","  
## chr (5): LarkOwl, DepressionStatus, AnxietyStatus, Stress, AlcoholUse  
## dbl (22): Gender, ClassYear, NumEarlyClass, EarlyClass, GPA, ClassesMissed, ...

##   
## i Use `spec()` to retrieve the full column specification for this data.  
## i Specify the column types or set `show\_col\_types = FALSE` to quiet this message.

1. Create a model to predict GPA from the average amount of sleep and use the test for correlation and test for slope to test the strength of the linear relationship between your variables.

test for corelation: H0: p = 0 Hα: p != 0

test for slope: H0:β1 = 0 Hα:β1 != 0 According to the test for slope, our p-value is 0.337 while the p-value of the correlation test is 0.3368; Both of which do not give us enough evidence to reject the null hypothesis, which means that there isnt a strong relationship between GPA and AverageSleep.

mod1 = lm(GPA~AverageSleep, data = SleepStudy)  
cor.test(SleepStudy$GPA,SleepStudy$AverageSleep)

##   
## Pearson's product-moment correlation  
##   
## data: SleepStudy$GPA and SleepStudy$AverageSleep  
## t = -0.96238, df = 251, p-value = 0.3368  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## -0.18259574 0.06316715  
## sample estimates:  
## cor   
## -0.06063317

summary(mod1)

##   
## Call:  
## lm(formula = GPA ~ AverageSleep, data = SleepStudy)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1.29018 -0.24395 0.03294 0.26317 0.80407   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 3.44618 0.21183 16.269 <2e-16 \*\*\*  
## AverageSleep -0.02541 0.02640 -0.962 0.337   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.4043 on 251 degrees of freedom  
## Multiple R-squared: 0.003676, Adjusted R-squared: -0.000293   
## F-statistic: 0.9262 on 1 and 251 DF, p-value: 0.3368