Homework 9 - Topic 5

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

*Question*: Construct 90% confidence and prediction intervals to assess the interval for average hours of sleep for all days for a first year and fourth year student. Interpret your findings in context.

SleepStudy\_mod = lm(AverageSleep ~ factor(ClassYear), data=SleepStudy)  
  
first\_year = data.frame(ClassYear = 1)  
fourth\_year = data.frame(ClassYear = 4)  
   
predict.lm(SleepStudy\_mod, first\_year, interval = "confidence", level = 0.90 )

## fit lwr upr  
## 1 7.925319 7.691953 8.158685

predict.lm(SleepStudy\_mod, first\_year, interval = "prediction", level = 0.90 )

## fit lwr upr  
## 1 7.925319 6.30851 9.542129

predict.lm(SleepStudy\_mod, fourth\_year, interval = "confidence", level = 0.90 )

## fit lwr upr  
## 1 7.95 7.738091 8.161909

predict.lm(SleepStudy\_mod, fourth\_year, interval = "prediction", level = 0.90 )

## fit lwr upr  
## 1 7.95 6.336148 9.563852

We are 90% confident that a first year student will sleep on average 7.691953 to 8.158685 hours every night.

We can predict 90% of the time that a first year student will sleep on average between 6.30851 and 9.542129 hours a night.

We are 90% confident that a fourth year student will sleep on average 7.738091 to 8.161909 hours every night.

We can predict 90% of the time that a first year student will sleep on average between 6.336148 and 9.563852 hours a night.