Homework 9

Alyssa Warnock, Helen Johnston, Ashley Wade, Hunter Barbee

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

## Gender ClassYear LarkOwl NumEarlyClass EarlyClass GPA ClassesMissed  
## 1 0 4 Neither 0 0 3.60 0  
## 2 0 4 Neither 2 1 3.24 0  
## 3 0 4 Owl 0 0 2.97 12  
## 4 0 1 Lark 5 1 3.76 0  
## 5 0 4 Owl 0 0 3.20 4  
## 6 1 4 Neither 0 0 3.50 0  
## CognitionZscore PoorSleepQuality DepressionScore AnxietyScore StressScore  
## 1 -0.26 4 4 3 8  
## 2 1.39 6 1 0 3  
## 3 0.38 18 18 18 9  
## 4 1.39 9 1 4 6  
## 5 1.22 9 7 25 14  
## 6 -0.04 6 14 8 28  
## DepressionStatus AnxietyStatus Stress DASScore Happiness AlcoholUse Drinks  
## 1 normal normal normal 15 28 Moderate 10  
## 2 normal normal normal 4 25 Moderate 6  
## 3 moderate severe normal 45 17 Light 3  
## 4 normal normal normal 11 32 Light 2  
## 5 normal severe normal 46 15 Moderate 4  
## 6 moderate moderate high 50 22 Abstain 0  
## WeekdayBed WeekdayRise WeekdaySleep WeekendBed WeekendRise WeekendSleep  
## 1 25.75 8.70 7.70 25.75 9.50 5.88  
## 2 25.70 8.20 6.80 26.00 10.00 7.25  
## 3 27.44 6.55 3.00 28.00 12.59 10.09  
## 4 23.50 7.17 6.77 27.00 8.00 7.25  
## 5 25.90 8.67 6.09 23.75 9.50 7.00  
## 6 23.80 8.95 9.05 26.00 10.75 9.00  
## AverageSleep AllNighter  
## 1 7.18 0  
## 2 6.93 0  
## 3 5.02 0  
## 4 6.90 0  
## 5 6.35 0  
## 6 9.04 0

1. For an female who has a stress score of 15, what does your model predict is the probability they have pulled an all nighter?

mod1=glm(AllNighter~Gender+AnxietyScore,family="binomial", data = Sleep)  
summary(mod1)

##   
## Call:  
## glm(formula = AllNighter ~ Gender + AnxietyScore, family = "binomial",   
## data = Sleep)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.9740 -0.6274 -0.4097 -0.3440 2.4140   
##   
## Coefficients:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -2.85800 0.40034 -7.139 9.4e-13 \*\*\*  
## Gender 1.27236 0.39675 3.207 0.00134 \*\*   
## AnxietyScore 0.06036 0.03428 1.761 0.07824 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for binomial family taken to be 1)  
##   
## Null deviance: 199.69 on 252 degrees of freedom  
## Residual deviance: 187.23 on 250 degrees of freedom  
## AIC: 193.23  
##   
## Number of Fisher Scoring iterations: 5

newx=data.frame(Gender=0,AnxietyScore=15)  
predict(mod1,newx,type="response")

## 1   
## 0.1242689

For a female with an anxiety score of 15, the model predicts the probability of having had an all-nighter this semester is 0.1242689