Predicting Probabilities

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```
Sleep<-read.csv("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