Flipped Assignment 18

Group 5

2022/4/26

Input Data

```
setwd('G:/OneDrive - Texas Tech University/IE 5344 Statistical Data Analysis/Flipped Assignment 18')
data <- read.csv('data-13-5.csv', header = TRUE)
data[,1] <- data[,1]/1000
```

Part a.

```
fit <- glm(y~., data, family = binomial(link='logit'))
summary(fit)
```

```
##
## Call:
## glm(formula = y ~ ., family = binomial(link = "logit"), data = data)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.5635  -0.8045  -0.1397   0.9535   1.7915
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -7.04706    4.67423  -1.508    0.132
## x1           0.07382    0.06371   1.159    0.247
## x2           0.98789    0.52737   1.873    0.061 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 27.726  on 19  degrees of freedom
## Residual deviance: 21.082  on 17  degrees of freedom
## AIC: 27.082
##
## Number of Fisher Scoring iterations: 5
```

So, $logit = -7.047 + 7.382e-5x_1 + 9.879e-01x_2$.

Part b.

The null deviance is 27.726 and the residual deviance is 21.082.

```
qchisq(0.95,1)
```

```
## [1] 3.841459
```

This model is significant because $3.841459 < 6.644$.

Part c.

```
O1 <- exp(1000*7.382e-5)
O2 <- exp(9.879e-01)
O1
```

```
## [1] 1.076613
```

```
O2
```

```
## [1] 2.685589
```

For the total family income's increase by 1000 dollar, the estimated probability of buying a new car in next 6 months increases by about 7.7%.

For the age of oldest car's increase by 1 year, the estimated probability of buying a new car in next 6 months increases by about 168.56%.

Part d.

```
predict(fit, data.frame(x1 = c(45000), x2 = c(5)), type='response')
```

```
## 1
## 1
```

The estimated probability that a family with an income of $45,000 and a car that is 5 years old will purchase a new vehicle in the next 6 months is 77.10%.