Project 1: Statistical Learning

Yapi Donatien Achou

November 3, 2018

1 Chapter 3.7, Exercice 10

1.1 Fit a multiple regression model to predict Sales, using Price, Urban, and US

The multiple linear regression equation is given by [1]

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_p X_p + \epsilon \tag{1}$$

where Y and $X_i, (i = 1, \ldots, p)$ are the response and predictors respectively, and $\beta_i, (i = 0, \ldots, p)$ are real numbers. With Sales as response and Price, Urban and US as predictors, equation (3) becomes

$$Sales = \beta_0 + \beta_1 Price + \beta_2 Urban + \beta_3 US + \epsilon \tag{2}$$

```r
#!/usr/bin/env Rscript
Library(ISLR)
library(MASS)
set.seed(1)
predictSales <- function(){
lm.fit = lm(Sales ~Price + Urban + US, data = Carseat)
summary(lm.fit)
}
```
Listing 1: R code to predict Sale given Price Urban and US

Table 1.1

Coefficients	Estimated Std	Error
Itercept	13	0.65
Price	-0.054	0.005
Urban YES	-0.02	0.27
US YES	1.2	0.26

Table 1: Summary statistics for the multiple regression model

1.2 Interpretation of each coefficient

1.3 Equation form of the model

The equation form of the model is given by

$$Sales = \beta_0 + \beta_1 Price + \beta_2 Urban + \beta_3 US + \epsilon \tag{3}$$

References

[1] Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani *An Introduction to Statistical Learning with application in R*. Springer Texts in Statistics, New York 2013