#3 Bikeshare & Auto Loss Analysis - Shahin Shakeri

I use R notebooks in RStudio cloud and the data is stored in the clound on my google drive. I submitted this notebook in original format which can be simply be opened in R desktop and run.

# 1- Bikeshare with days added

## 1.a) Rentals ~ Weekends

library('lattice')  
Bikeshare <- read.csv(url("https://drive.google.com/uc?export=download&id=1QwGCiIbESsE1RVjhKu9nivgvfyYFewDG"),na.strings = '?')  
Bikeshare$Weekend=Bikeshare$Weekday==5 |Bikeshare$Weekday==6

model <- lm(Rentals~Temperature+ Humidity +Windspeed+Weekend ,data=Bikeshare)  
summary(model)

##   
## Call:  
## lm(formula = Rentals ~ Temperature + Humidity + Windspeed + Weekend,   
## data = Bikeshare)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -4710.2 -1080.9 -91.9 1053.0 3525.3   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 4009.2 341.0 11.759 < 2e-16 \*\*\*  
## Temperature 6633.5 292.8 22.652 < 2e-16 \*\*\*  
## Humidity -3071.6 384.0 -7.998 4.99e-15 \*\*\*  
## Windspeed -4799.9 708.2 -6.777 2.53e-11 \*\*\*  
## WeekendTRUE 182.0 116.7 1.560 0.119   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1424 on 726 degrees of freedom  
## Multiple R-squared: 0.4627, Adjusted R-squared: 0.4597   
## F-statistic: 156.3 on 4 and 726 DF, p-value: < 2.2e-16

## 1.b) Registered ~ Weekends

model <- lm(Registered~Temperature+ Humidity +Windspeed+Weekend ,data=Bikeshare)  
summary(model)

##   
## Call:  
## lm(formula = Registered ~ Temperature + Humidity + Windspeed +   
## Weekend, data = Bikeshare)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -3812.7 -995.0 -157.2 964.0 3110.5   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 3581.6 301.6 11.874 < 2e-16 \*\*\*  
## Temperature 4569.1 259.1 17.636 < 2e-16 \*\*\*  
## Humidity -2274.6 339.8 -6.695 4.32e-11 \*\*\*  
## Windspeed -3702.7 626.6 -5.910 5.28e-09 \*\*\*  
## WeekendTRUE -193.4 103.3 -1.873 0.0614 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1260 on 726 degrees of freedom  
## Multiple R-squared: 0.3517, Adjusted R-squared: 0.3481   
## F-statistic: 98.47 on 4 and 726 DF, p-value: < 2.2e-16

## 1.c) Casual ~ Weekends

model <- lm(Casual~Temperature+ Humidity +Windspeed+Weekend ,data=Bikeshare)  
summary(model)

##   
## Call:  
## lm(formula = Casual ~ Temperature + Humidity + Windspeed + Weekend,   
## data = Bikeshare)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1383.7 -314.8 -107.3 127.5 2222.6   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 427.6 128.5 3.327 0.000922 \*\*\*  
## Temperature 2064.4 110.4 18.702 < 2e-16 \*\*\*  
## Humidity -797.0 144.8 -5.505 5.11e-08 \*\*\*  
## Windspeed -1097.2 267.0 -4.110 4.41e-05 \*\*\*  
## WeekendTRUE 375.5 44.0 8.534 < 2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 536.7 on 726 degrees of freedom  
## Multiple R-squared: 0.3923, Adjusted R-squared: 0.389   
## F-statistic: 117.2 on 4 and 726 DF, p-value: < 2.2e-16

## d) Weekends impacts casual rentals p<.05 but not significant for rental and registered (p>.05)

# 2- Autoloss

Autoloss <- read.csv(url("https://drive.google.com/uc?export=download&id=1-QuNWq7k4w3c8kBJ8BedIK1m-cpwORiV"),na.strings = '?')  
Autoloss <-na.omit (Autoloss)  
ByDoors=tapply(Autoloss$Losses, Autoloss$NumDoors, mean)

library(leaps)  
  
regfit.full=regsubsets(Losses~., data = Autoloss, nvmax=11)  
summary=summary(regfit.full)  
summary

## Subset selection object  
## Call: regsubsets.formula(Losses ~ ., data = Autoloss, nvmax = 11)  
## 18 Variables (and intercept)  
## Forced in Forced out  
## FuelTypegas FALSE FALSE  
## Aspirationturbo FALSE FALSE  
## NumDoorstwo FALSE FALSE  
## BodyStylehardtop FALSE FALSE  
## BodyStylehatchback FALSE FALSE  
## BodyStylesedan FALSE FALSE  
## BodyStylewagon FALSE FALSE  
## DriveWheelsfwd FALSE FALSE  
## DriveWheelsrwd FALSE FALSE  
## Length FALSE FALSE  
## Width FALSE FALSE  
## Height FALSE FALSE  
## Weight FALSE FALSE  
## EngineSize FALSE FALSE  
## Horsepower FALSE FALSE  
## PeakRPM FALSE FALSE  
## Citympg FALSE FALSE  
## Price FALSE FALSE  
## 1 subsets of each size up to 11  
## Selection Algorithm: exhaustive  
## FuelTypegas Aspirationturbo NumDoorstwo BodyStylehardtop  
## 1 ( 1 ) " " " " " " " "   
## 2 ( 1 ) " " " " " " " "   
## 3 ( 1 ) " " " " "\*" " "   
## 4 ( 1 ) " " " " "\*" " "   
## 5 ( 1 ) " " " " "\*" " "   
## 6 ( 1 ) " " " " "\*" " "   
## 7 ( 1 ) " " " " "\*" " "   
## 8 ( 1 ) " " " " "\*" " "   
## 9 ( 1 ) " " " " "\*" " "   
## 10 ( 1 ) " " " " "\*" " "   
## 11 ( 1 ) " " " " "\*" " "   
## BodyStylehatchback BodyStylesedan BodyStylewagon DriveWheelsfwd  
## 1 ( 1 ) " " " " " " " "   
## 2 ( 1 ) " " " " " " " "   
## 3 ( 1 ) " " " " " " " "   
## 4 ( 1 ) " " "\*" " " " "   
## 5 ( 1 ) " " "\*" " " " "   
## 6 ( 1 ) " " "\*" " " " "   
## 7 ( 1 ) "\*" "\*" " " " "   
## 8 ( 1 ) "\*" "\*" " " " "   
## 9 ( 1 ) "\*" "\*" " " " "   
## 10 ( 1 ) "\*" "\*" "\*" " "   
## 11 ( 1 ) "\*" "\*" " " " "   
## DriveWheelsrwd Length Width Height Weight EngineSize Horsepower  
## 1 ( 1 ) " " " " " " "\*" " " " " " "   
## 2 ( 1 ) "\*" " " " " "\*" " " " " " "   
## 3 ( 1 ) "\*" " " " " "\*" " " " " " "   
## 4 ( 1 ) " " " " " " "\*" " " " " " "   
## 5 ( 1 ) "\*" " " " " "\*" " " " " " "   
## 6 ( 1 ) "\*" " " " " "\*" " " " " " "   
## 7 ( 1 ) "\*" " " " " "\*" " " " " " "   
## 8 ( 1 ) "\*" " " " " "\*" " " "\*" " "   
## 9 ( 1 ) "\*" " " " " "\*" " " "\*" "\*"   
## 10 ( 1 ) "\*" " " " " "\*" " " "\*" "\*"   
## 11 ( 1 ) "\*" " " "\*" "\*" "\*" "\*" "\*"   
## PeakRPM Citympg Price  
## 1 ( 1 ) " " " " " "   
## 2 ( 1 ) " " " " " "   
## 3 ( 1 ) " " " " " "   
## 4 ( 1 ) " " "\*" " "   
## 5 ( 1 ) " " "\*" " "   
## 6 ( 1 ) "\*" "\*" " "   
## 7 ( 1 ) "\*" "\*" " "   
## 8 ( 1 ) "\*" "\*" " "   
## 9 ( 1 ) "\*" "\*" " "   
## 10 ( 1 ) "\*" "\*" " "   
## 11 ( 1 ) "\*" "\*" " "

# 3- Model - Sallaries

function(Gender, IQ, GPA){  
 return (45 + Gender\*30+IQ\*.05,+20\*GPA)  
}

## function(Gender, IQ, GPA){  
## return (45 + Gender\*30+IQ\*.05,+20\*GPA)  
## }