ISLR Chapter 2, Question 09

Lasanthi

2/14/2018

a)

```r
library(ISLR)
#Auto
names(Auto)
```

```
## [1] "mpg"          "cylinders"    "displacement" "horsepower"
## [5] "weight"       "acceleration" "year"         "origin"
## [9] "name"
```

```r
str(Auto)
```

```
## 'data.frame':    392 obs. of  9 variables:
##  $ mpg          : num  18 15 18 16 17 15 14 14 14 15 ...
##  $ cylinders    : num  8 8 8 8 8 8 8 8 8 8 ...
##  $ displacement : num  307 350 318 304 302 429 454 440 455 390 ...
##  $ horsepower   : num  130 165 150 150 140 198 220 215 225 190 ...
##  $ weight       : num  3504 3693 3436 3433 3449 ...
##  $ acceleration : num  12 11.5 11 12 10.5 10 9 8.5 10 8.5 ...
##  $ year         : num  70 70 70 70 70 70 70 70 70 70 ...
##  $ origin       : num  1 1 1 1 1 1 1 1 1 1 ...
##  $ name         : Factor w/ 304 levels "amc ambassador brougham",..: 49 36 231 14 161 141 54 223 241 2
```

```r
summary(Auto)
```

```
##       mpg          cylinders      displacement     horsepower
##  Min.   : 9.00   Min.   :3.000   Min.   : 68.0   Min.   : 46.0
##  1st Qu.:17.00   1st Qu.:4.000   1st Qu.:105.0   1st Qu.: 75.0
##  Median :22.75   Median :4.000   Median :151.0   Median : 93.5
##  Mean   :23.45   Mean   :5.472   Mean   :194.4   Mean   :104.5
##  3rd Qu.:29.00   3rd Qu.:8.000   3rd Qu.:275.8   3rd Qu.:126.0
##  Max.   :46.60   Max.   :8.000   Max.   :455.0   Max.   :230.0
##
##      weight      acceleration        year           origin
##  Min.   :1613   Min.   : 8.00   Min.   :70.00   Min.   :1.000
##  1st Qu.:2225   1st Qu.:13.78   1st Qu.:73.00   1st Qu.:1.000
##  Median :2804   Median :15.50   Median :76.00   Median :1.000
##  Mean   :2978   Mean   :15.54   Mean   :75.98   Mean   :1.577
##  3rd Qu.:3615   3rd Qu.:17.02   3rd Qu.:79.00   3rd Qu.:2.000
##  Max.   :5140   Max.   :24.80   Max.   :82.00   Max.   :3.000
##
##                  name
##  amc matador      :  5
##  ford pinto       :  5
##  toyota corolla   :  5
##  amc gremlin      :  4
##  amc hornet       :  4
##  chevrolet chevette:  4
```

```
##  (Other)          :365
```
```
sapply(Auto, is.factor)
```
```
##          mpg     cylinders displacement    horsepower        weight
##        FALSE         FALSE        FALSE         FALSE         FALSE
## acceleration          year        origin          name
##        FALSE         FALSE        FALSE          TRUE
```

There are 7 quantitative variables: mpg, cylinders, displacement, horsepower, weight,acceleration, year. There are 2 qualitative variables: name, origin.

b)

```
sapply(Auto[,1:7], range)
```
```
##       mpg cylinders displacement horsepower weight acceleration year
## [1,]  9.0         3           68         46   1613          8.0   70
## [2,] 46.6         8          455        230   5140         24.8   82
```

c)

Means of all quantitative variables are:

```
sapply(Auto[,1:7], mean)
```
```
##          mpg     cylinders displacement    horsepower        weight
##    23.445918      5.471939   194.411990    104.469388   2977.584184
## acceleration          year
##    15.541327     75.979592
```

Standard deviations of all quantitative variables are:

```
sds <- sapply(Auto[,1:7], sd)
sds
```
```
##          mpg     cylinders displacement    horsepower        weight
##     7.805007      1.705783   104.644004     38.491160    849.402560
## acceleration          year
##     2.758864      3.683737
```

d)

```
newAuto <- Auto[-(10:85),]
#newAuto
sapply(newAuto[,1:7], range)
```
```
##        mpg cylinders displacement horsepower weight acceleration year
## [1,] 11.0         3           68         46   1649          8.5   70
## [2,] 46.6         8          455        230   4997         24.8   82
```
```
sapply(newAuto[,1:7], mean)
```
```
##          mpg     cylinders displacement    horsepower        weight
##    24.404430      5.373418   187.240506    100.721519   2935.971519
```
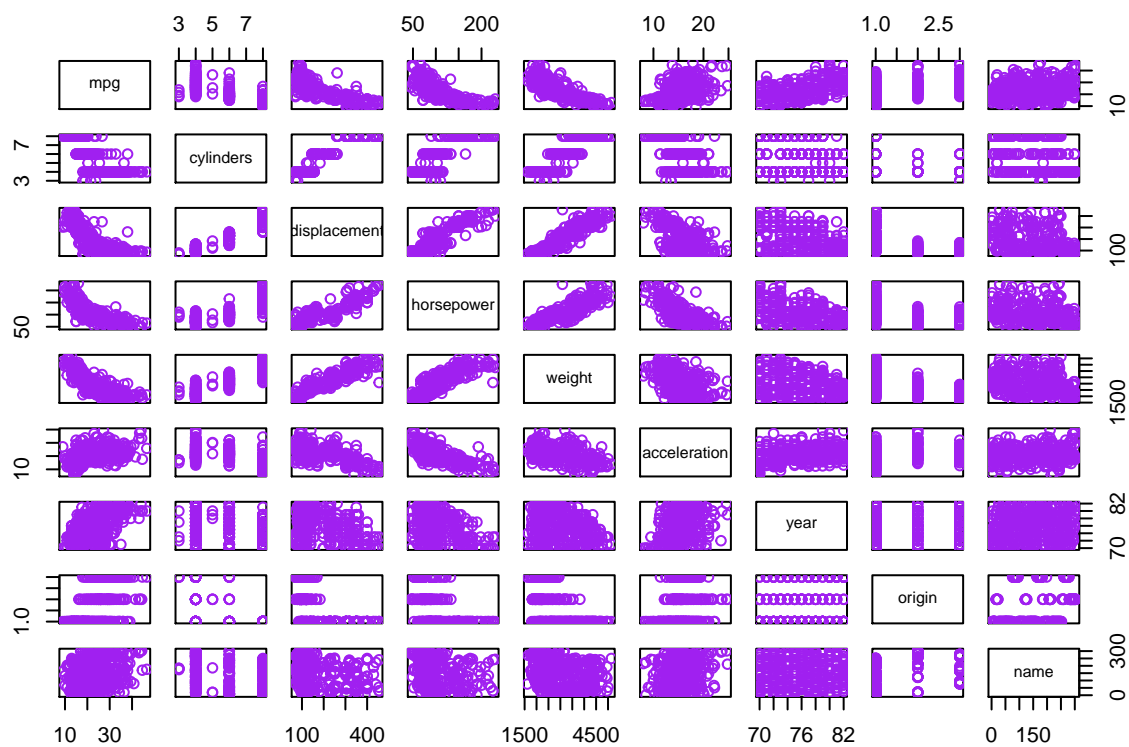
```
## acceleration           year
##      15.726899      77.145570
```

```
sapply(newAuto[,1:7], sd)
```
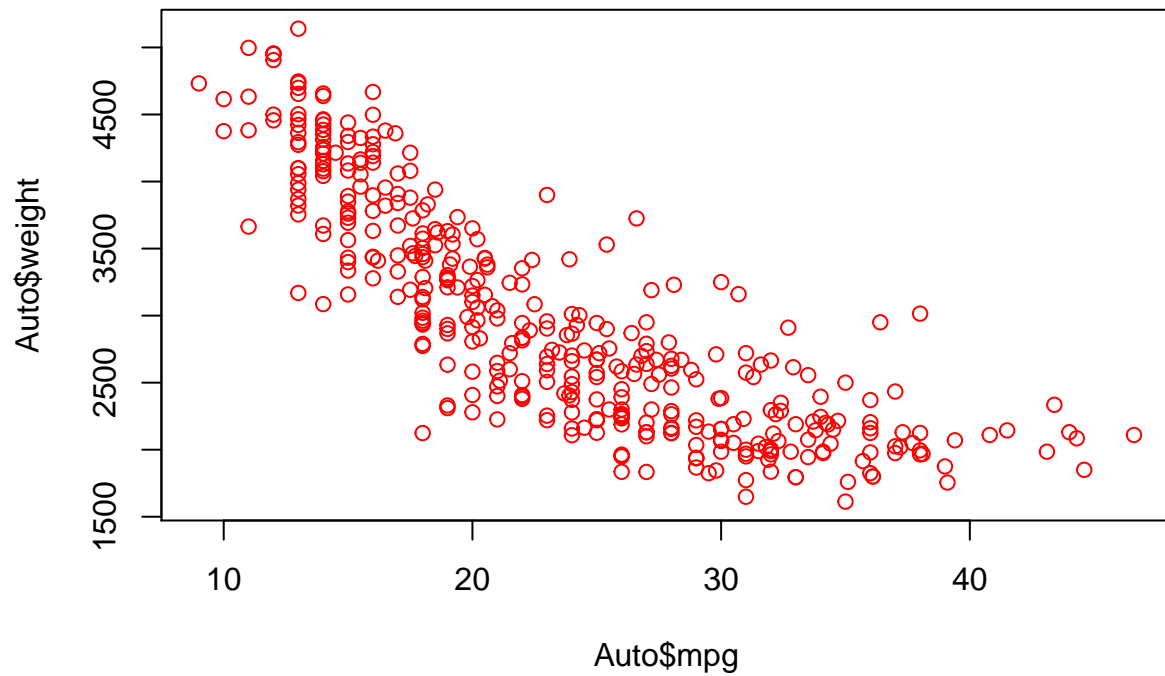
```
##            mpg     cylinders displacement   horsepower       weight
##       7.867283      1.654179     99.678367     35.708853    811.300208
## acceleration           year
##       2.693721      3.106217
```
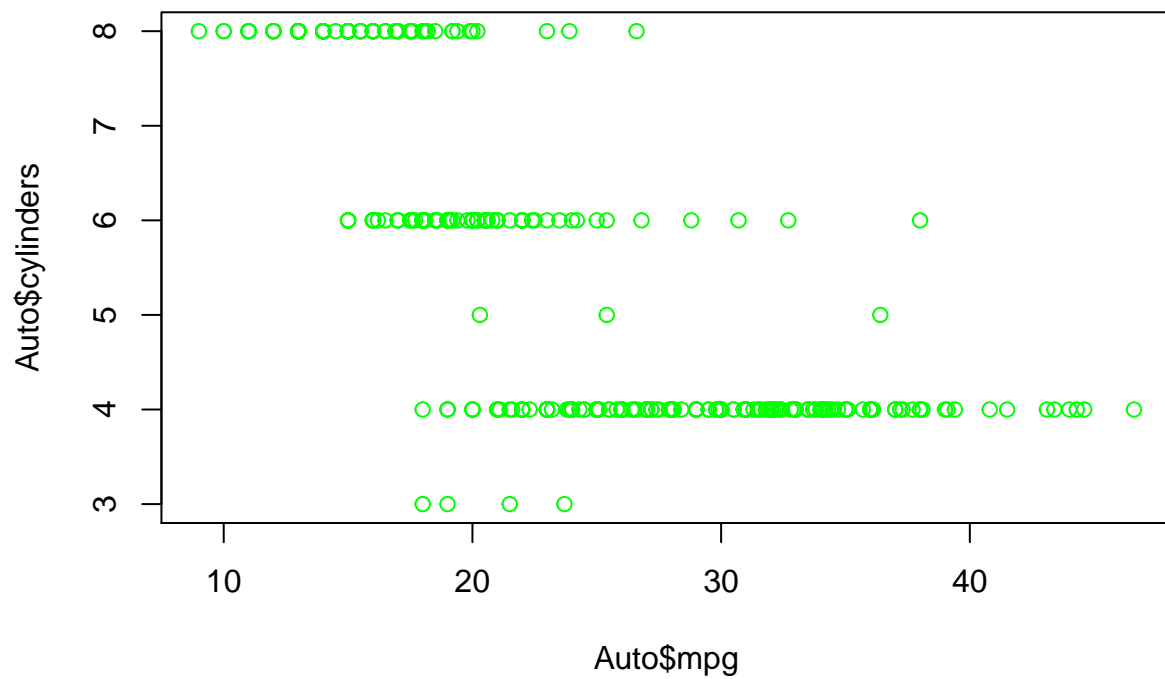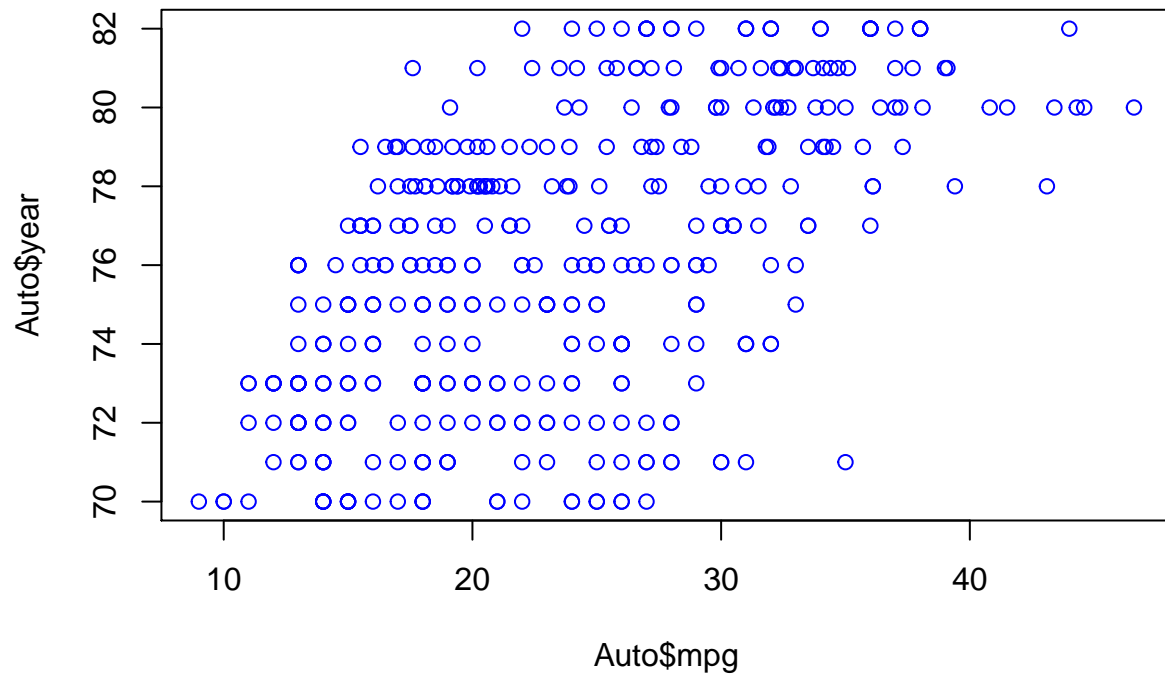
e)

```
#?plot
pairs(Auto, col = "purple")
```



```
plot(Auto$mpg, Auto$weight, col = "red")
```

```
plot(Auto$mpg, Auto$cylinders, col = "green")
```



```
plot(Auto$mpg, Auto$year, col = "blue")
```

f)