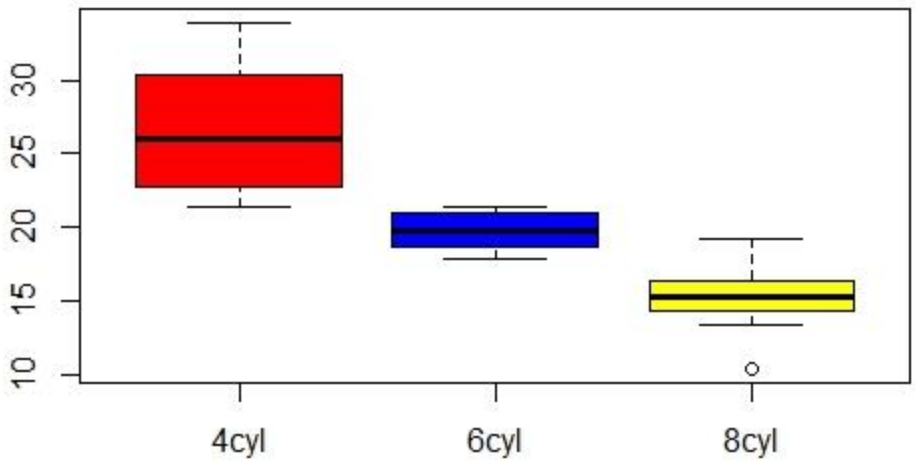
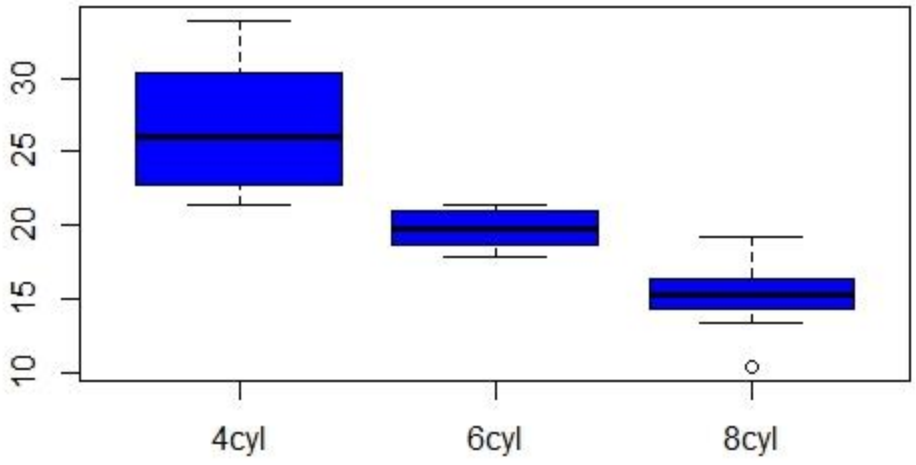
Assignment 7.3

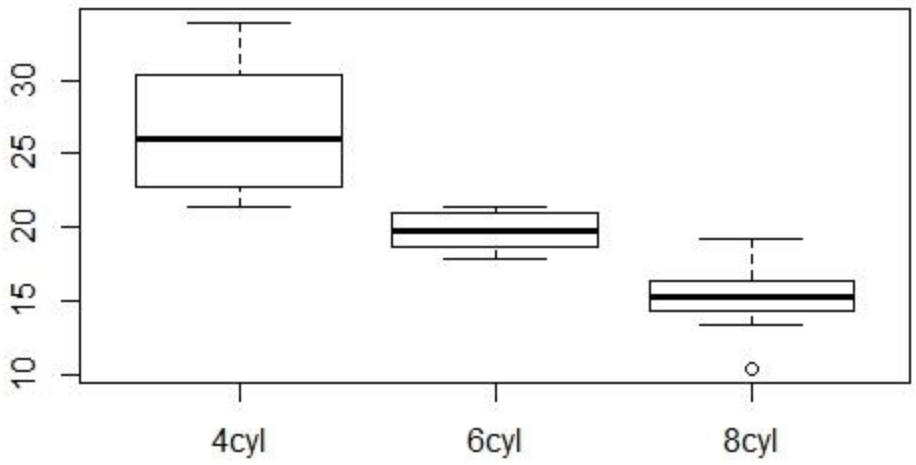
1. Create a box and whisker plot by class using mtcars dataset.

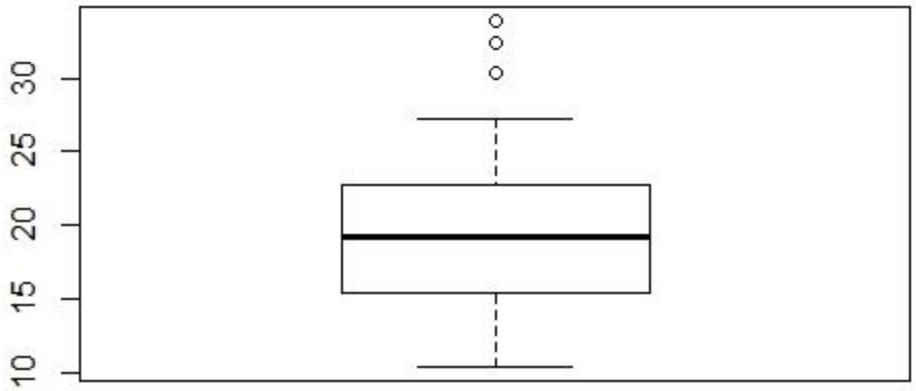
```
summary(cars)
boxplot(mtcars$mpg)
boxplot(mtcars$mpg, horizontal = TRUE)
boxplot(mtcars$mpg, col = 'blue')
boxplot(mtcars$mpg, border = 'red')
boxplot(mtcars$mpg, range = 0)
boxplot(mtcars$mpg, range = 1)
boxplot(mtcars$mpg, range = 1, outline = FALSE)
boxplot(mtcars$mpg ~ mtcars$cyl)
mpg_split <- split(mtcars$mpg, mtcars$cyl)
mpg_split
mpg_4 <- mpg_split$`4`
mpg_6 <- mpg_split$`6`
mpg_8 <- mpg_split$`8`
boxplot(mpg_4, mpg_6, mpg_8)
boxplot(mtcars$mpg ~ mtcars$cyl, col = 'blue')
boxplot(mtcars$mpg ~ mtcars$cyl,col = c('red', 'blue', 'yellow'))
boxplot(mtcars$mpg ~ mtcars$cyl, range = 1, outline = TRUE,horizontal = TRUE,
col = c('red', 'blue', 'yellow'), main = 'Miles Per Gallon by Cylinders',ylab
= 'Number of Cylinders', xlab = 'Miles Per Gallon',names = c('Four', 'Six', '
Eight'))
```

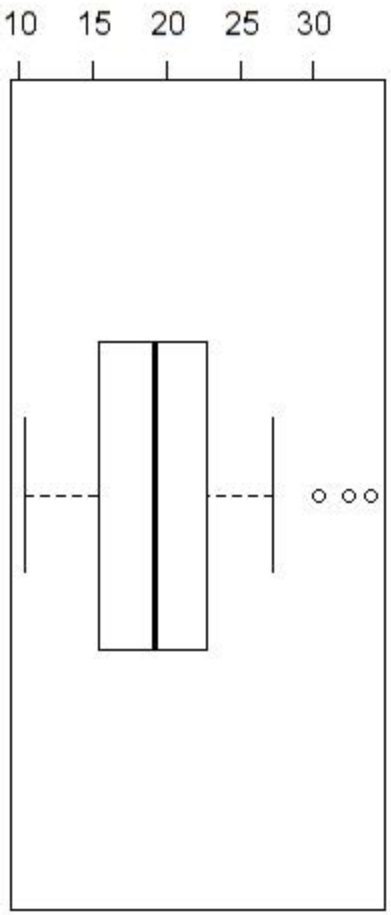
```
{r setup, include=FALSE} knitr::opts_chunk$set(echo = TRUE)
```

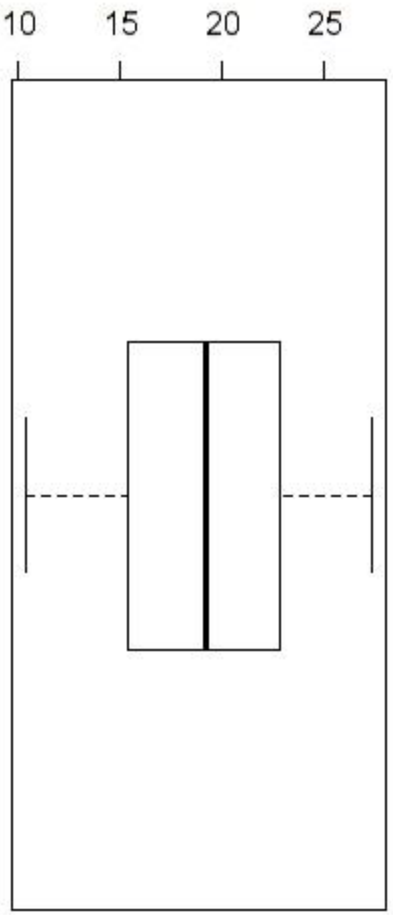

10
15
20
25
30
4cyl
6cyl
8cyl

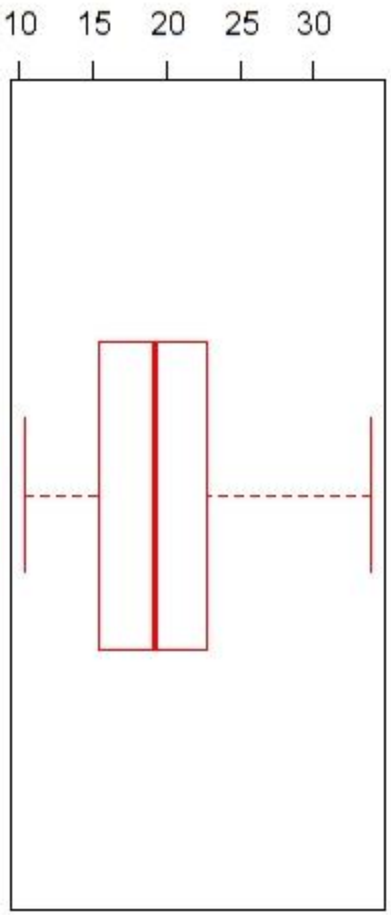

10
15
20
25
30
4cyl
6cyl
8cyl

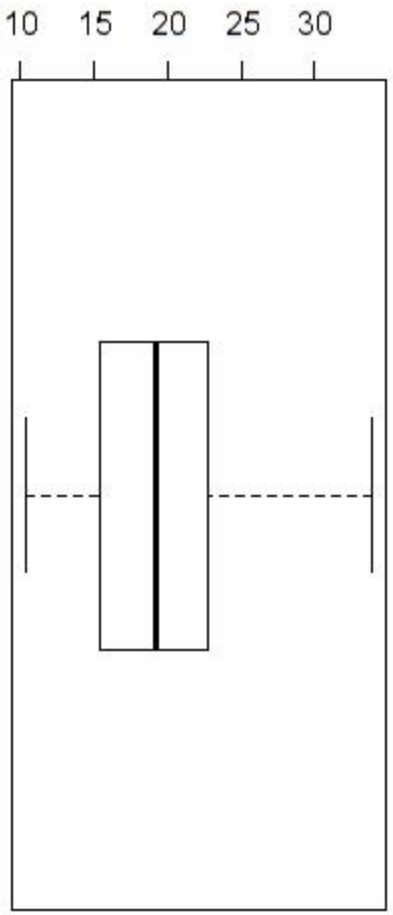

10
15
20
25
30
4cyl
6cyl
8cyl

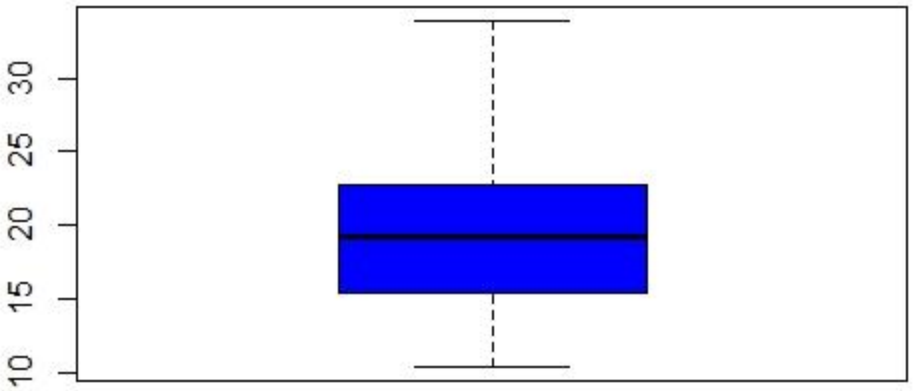

10
15
20
25
30

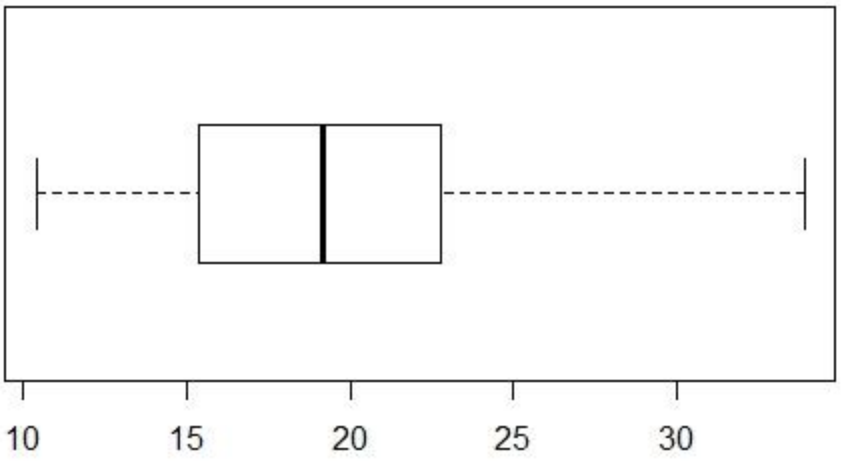

10
15
20
25
30

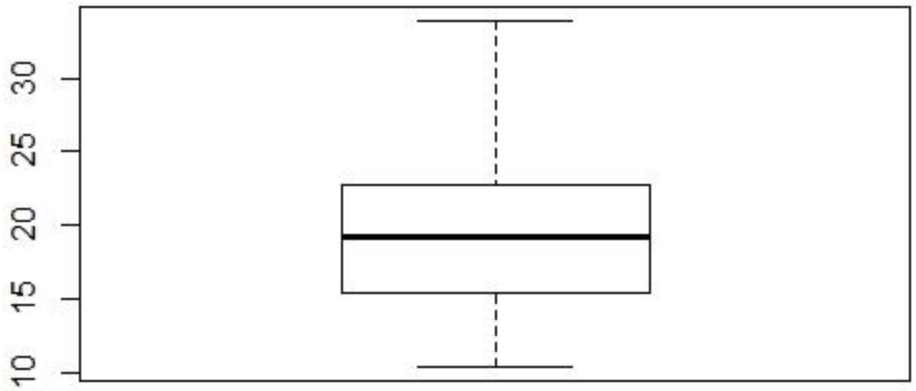

10
15
20
25

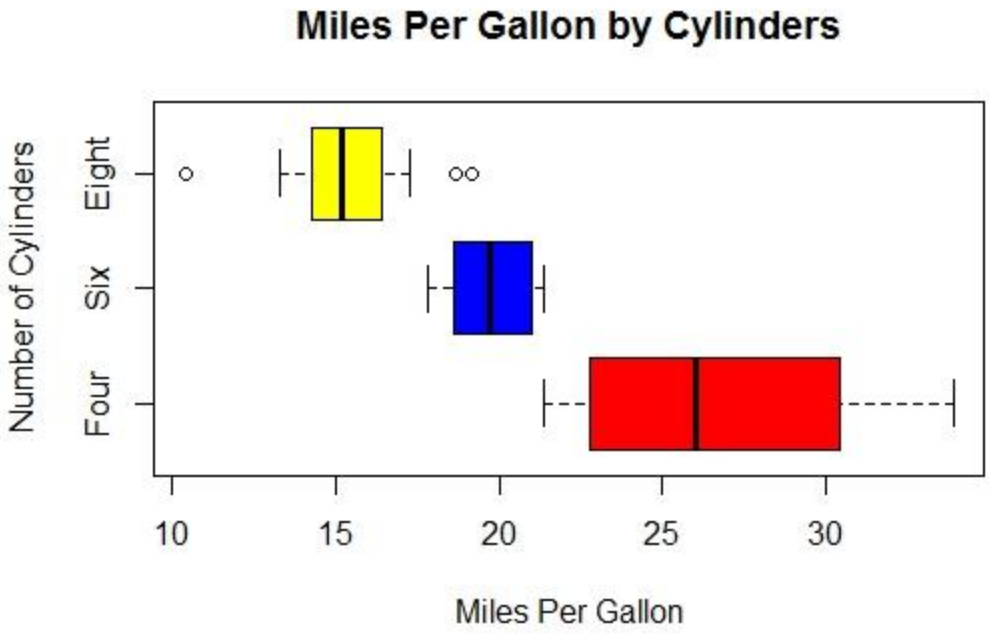

10
15
20
25
30


10
15
20
25
30


10
15
20
25
30


10
15
20
25
30


10
15
20
25
30


Miles Per Gallon by Cylinders
Number of Cylinders
Four
Six
Eight
10
15
20
25
30
Miles Per Gallon

R Script

```
library(ggplot2)
library(xtable)
head(mtcars)
mtcars$cyl <- factor(mtcars$cyl)
mtcars$labels <- row.names(mtcars)
summary(mtcars)
library(gridExtra)
library(ggplot2)
library(ggthemes)
library(tufte)
p <- ggplot(data = mtcars, aes(x = cyl, y = mpg, fill = cyl))


p <- p + geom_boxplot() +ggtitle("Car Milage Data") +labs(x = "Number of Cyli
nders", y = "Miles Per Gallon") +scale_fill_discrete(name = "Cylinders")


p


p <- ggplot(mtcars, aes(x = wt, y = mpg)) +geom_point() +ggtitle("Cars")
p2 <- ggplot(mtcars, aes(x = wt, y = mpg, colour = factor(gear))) +geom_point
() +ggtitle("Cars")


p3 <- p2 + facet_wrap(~ am)p + geom_rangeframe() +theme_tufte() + scale_x_con
tinuous(breaks = extended_range_breaks()(mtcars$wt)) +scale_y_continuous(brea
ks = extended_range_breaks()(mtcars$mpg))


p4 <- ggplot(mtcars, aes(factor(cyl), mpg))p4 + theme_tufte(ticks=FALSE) + ge
om_tufteboxplot()p4 + theme_tufte(ticks=FALSE) +geom_tufteboxplot(median.type
= "line")p4 + theme_tufte(ticks=FALSE) +geom_tufteboxplot(median.type = "line
", whisker.type = 'point', hoffset = 0)p4 + theme_tufte(ticks=FALSE) +geom_tu
fteboxplot(median.type = "line", whisker.type = 'line', hoffset = 0, width =
3)
```

```
{r setup, include=FALSE} knitr::opts_chunk$set(echo = TRUE)
```

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am
	<dbl>	<fctr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<fctr>

	mpg <dbl>	cyl <fctr>	disp <dbl>	hp <dbl>	drat <dbl>	wt <dbl>	qsec <dbl>	vs <dbl>	am <fctr>	
Mazda RX4	21.0	6cyl	160	110	3.90	2.620	16.46	0	Manual	
Mazda RX4 Wag	21.0	6cyl	160	110	3.90	2.875	17.02	0	Manual	
Datsun 710	22.8	4cyl	108	93	3.85	2.320	18.61	1	Manual	
Hornet 4 Drive	21.4	6cyl	258	110	3.08	3.215	19.44	1	Automatic	
Hornet Sportabout	18.7	8cyl	360	175	3.15	3.440	17.02	0	Automatic	
Valiant	18.1	6cyl	225	105	2.76	3.460	20.22	1	Automatic	

6 rows | 1-10 of 12 columns

	mpg <dbl>	cyl <fctr>	disp <dbl>	hp <dbl>	drat <dbl>	wt <dbl>
Mazda RX4	21.0	6cyl	160	110	3.90	2.620
Mazda RX4 Wag	21.0	6cyl	160	110	3.90	2.875
Datsun 710	22.8	4cyl	108	93	3.85	2.320
Hornet 4 Drive	21.4	6cyl	258	110	3.08	3.215
Hornet Sportabout	18.7	8cyl	360	175	3.15	3.440
Valiant	18.1	6cyl	225	105	2.76	3.460

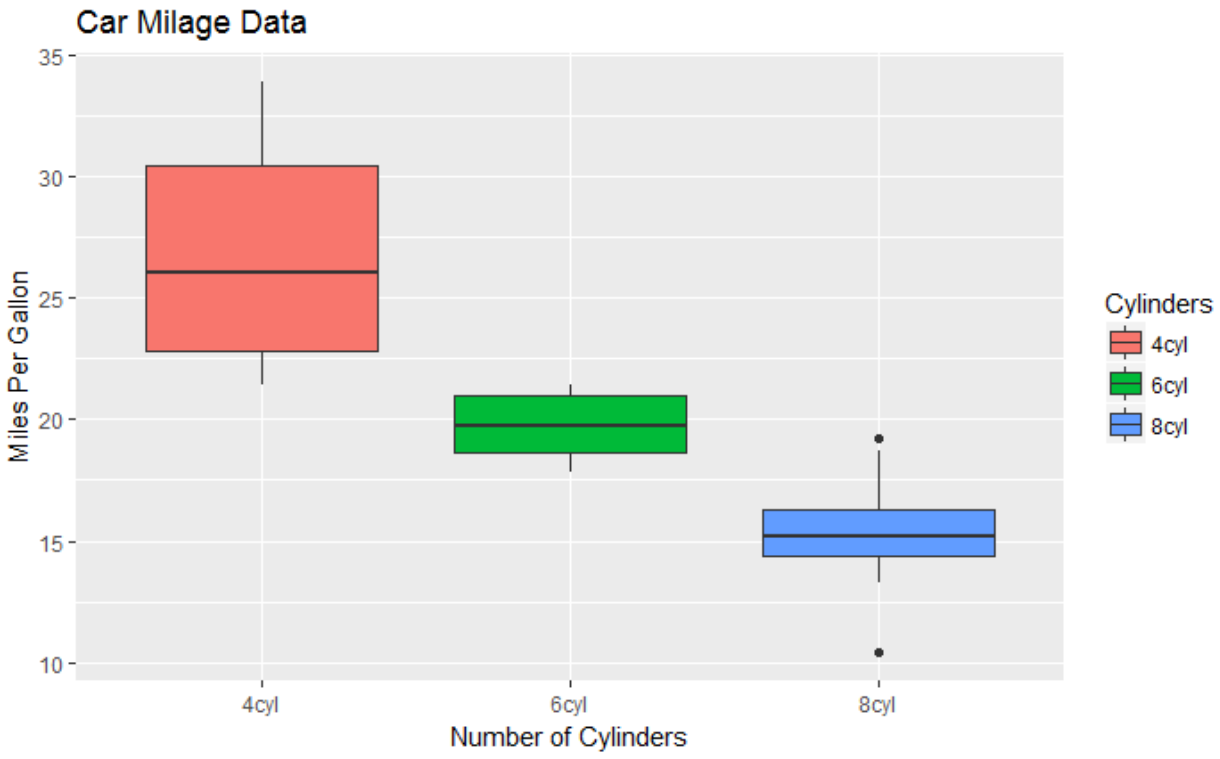
6 rows | 1-7 of 12 columns

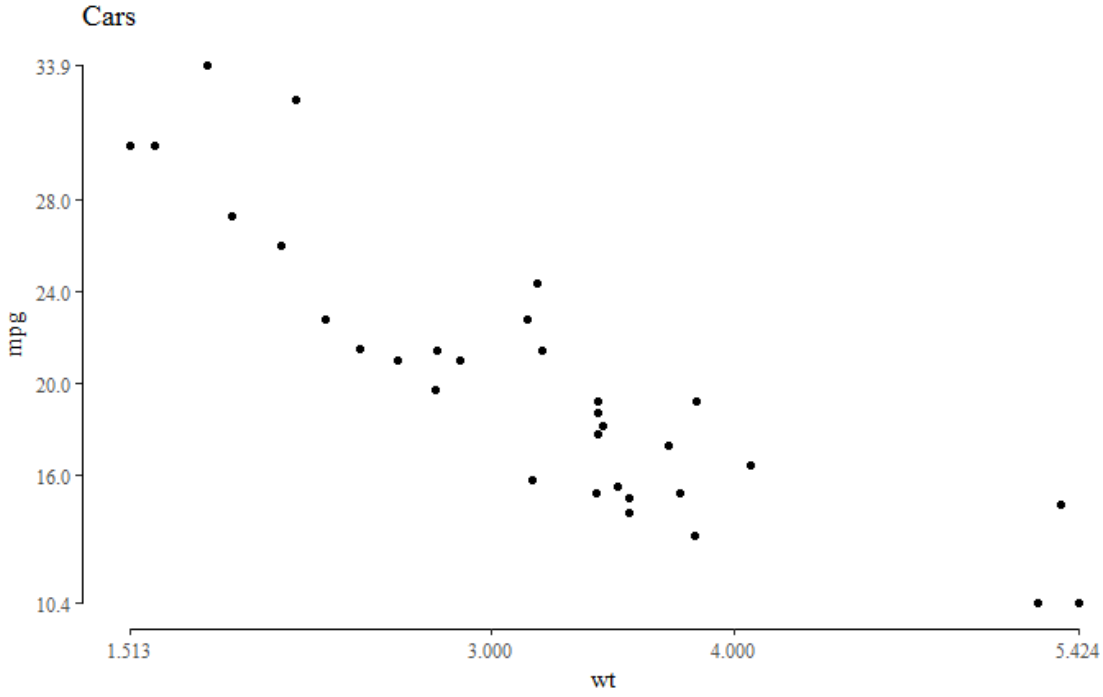
data.frame

6 x 12

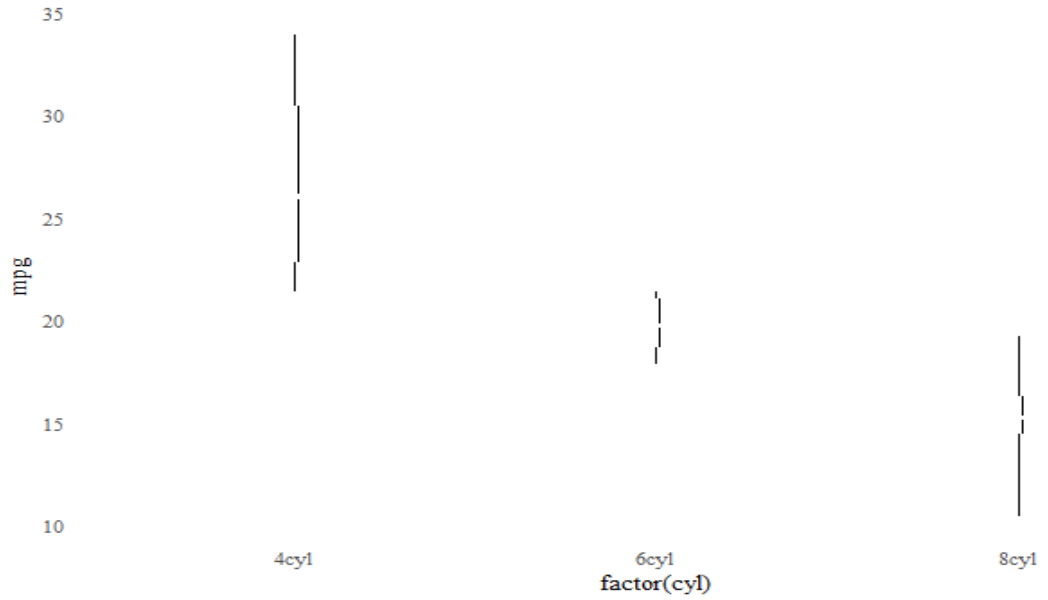
```
      mpg             cyl           disp             hp             drat      
 Min.   :10.40   4cyl:11   Min.   : 71.1   Min.   : 52.0   Min.   :2.760  
 1st Qu.:15.43   6cyl: 7   1st Qu.:120.8   1st Qu.: 96.5   1st Qu.:3.080  
 Median :19.20   8cyl:14   Median :196.3   Median :123.0   Median :3.695  
 Mean   :20.09             Mean   :230.7   Mean   :146.7   Mean   :3.597  
 3rd Qu.:22.80             3rd Qu.:326.0   3rd Qu.:180.0   3rd Qu.:3.920  
 Max.   :33.90             Max.   :472.0   Max.   :335.0   Max.   :4.930  
       wt             qsec             vs                 am         gear       
 Min.   :1.513   Min.   :14.50   Min.   :0.0000   Automatic:19   3gears:15  
 1st Qu.:2.581   1st Qu.:16.89   1st Qu.:0.0000   Manual   :13   4gears:12  
 Median :3.325   Median :17.71   Median :0.0000                  5gears: 5  
 Mean   :3.217   Mean   :17.85   Mean   :0.4375                             
 3rd Qu.:3.610   3rd Qu.:18.90   3rd Qu.:1.0000                             
 Max.   :5.424   Max.   :22.90   Max.   :1.0000                             
      carb          labels         
 Min.   :1.000   Length:32          
 1st Qu.:2.000   Class :character   
 Median :2.000   Mode  :character   
 Mean   :2.812                      
 3rd Qu.:4.000                      
 Max.   :8.000                      
```

R Console


Car Milage Data
Miles Per Gallon
35
30
25
20
15
10
4cyl
6cyl
8cyl
Number of Cylinders
Cylinders
4cyl
6cyl
8cyl

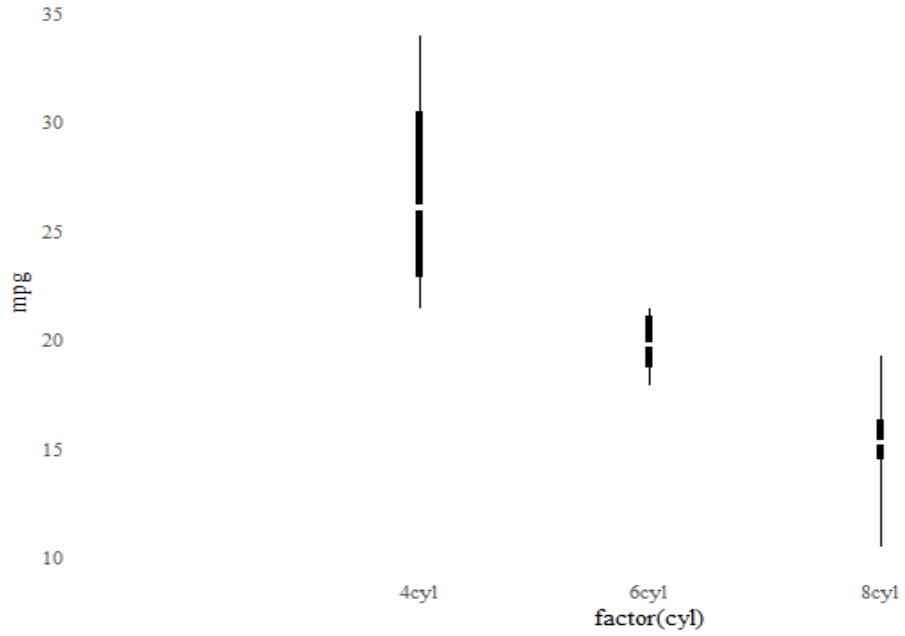

Cars
mpg
33.9
28.0
24.0
20.0
16.0
10.4
1.513
3.000
4.000
5.424
wt

```
p3 <- p2 + facet_wrap(~ am)p + geom_rangeframe() +theme_tufte() +
scale_x_continuous(breaks = extended_range_breaks()(mtcars$wt)) +
scale_y_continuous(breaks = extended_range_breaks()(mtcars$mpg))
```



Whisker type box plot

```
p4 <- ggplot(mtcars, aes(factor(cyl), mpg))p4 + theme_tufte(ticks=FALSE) + ge
om_tufteboxplot()p4 + theme_tufte(ticks=FALSE) +geom_tufteboxplot(median.type
= "line")p4 + theme_tufte(ticks=FALSE) +geom_tufteboxplot(median.type = "line
", whisker.type = 'point', hoffset = 0)p4 + theme_tufte(ticks=FALSE) +geom_tu
fteboxplot(median.type = "line", whisker.type = 'line', hoffset = 0, width =
3)
```



R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
{r cars} summary(cars)
```

Including Plots

You can also embed plots, for example:

```
{r pressure, echo=FALSE} plot(pressure)
```

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
{r cars} summary(cars)
```

Including Plots

You can also embed plots, for example:

```
{r pressure, echo=FALSE} plot(pressure)
```

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

```
     speed           dist
 Min.   : 4.0   Min.   :  2.00
 1st Qu.:12.0   1st Qu.: 26.00
 Median :15.0   Median : 36.00
 Mean   :15.4   Mean   : 42.98
 3rd Qu.:19.0   3rd Qu.: 56.00
 Max.   :25.0   Max.   :120.00
$`4cyl`
 [1] 22.8 24.4 22.8 32.4 30.4 33.9 21.5 27.3 26.0 30.4 21.4

$`6cyl`
[1] 21.0 21.0 21.4 18.1 19.2 17.8 19.7

$`8cyl`
 [1] 18.7 14.3 16.4 17.3 15.2 10.4 10.4 14.7 15.5 15.2 13.3 19.2 15.8 15.0

                                    R Console
```