

Experiment 12:

Illustrate the following basic graphics in R:

- a. Bar plots
- b. Pie Charts
- c. Histograms
- d. Kernel density plots
- e. Boxplots
- f. Dotplots

- ▶ Aim: To understand and use basic graphics in R

Exp. 12 a: Bar plots in R

- ▶ A bar chart represents data in rectangular bars with length of the bar proportional to the value of the variable
- ▶ R uses the function **barplot()** to create bar charts
- ▶ R can draw both vertical and horizontal bars in the bar chart

Exp. 12 a: Bar plots in R

► Syntax:

barplot(height,xlab,ylab,main, names.arg,col)

where

height is a vector or matrix containing numeric values

xlab is the label for x axis

ylab is the label for y axis

main is the title of the bar chart

names.arg is a vector of names appearing under each bar

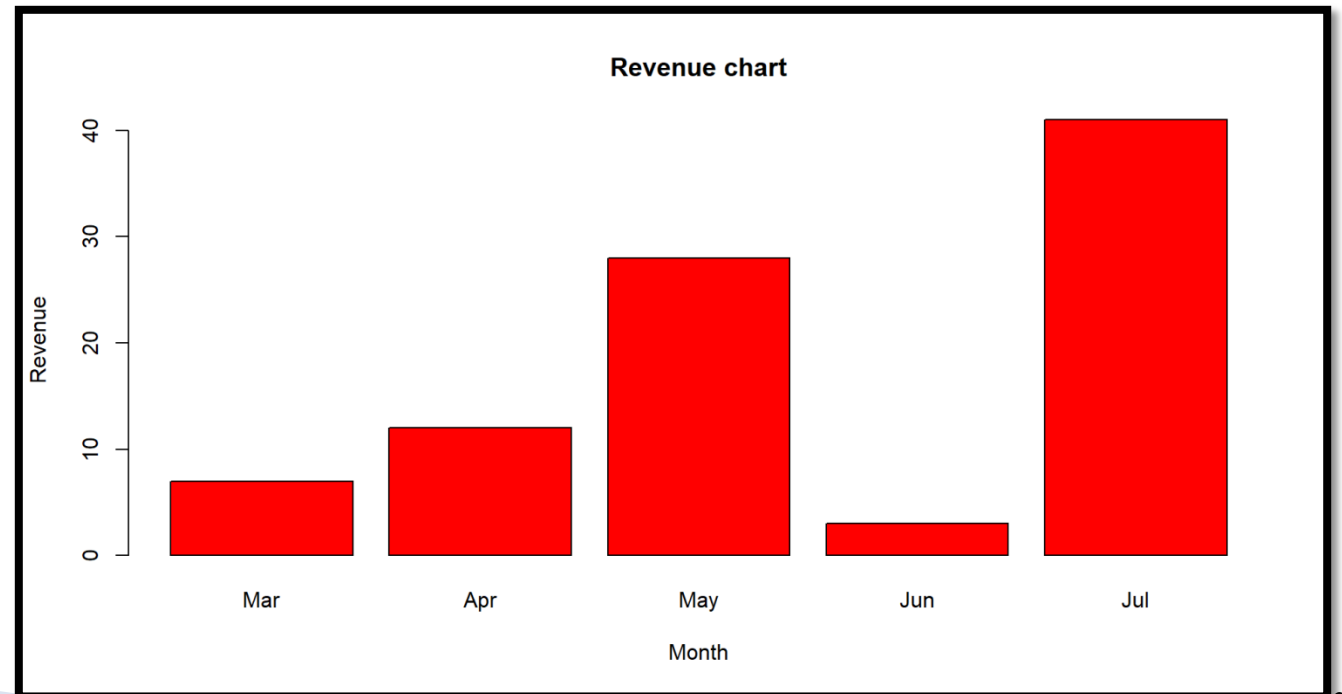
col is used to give colors to the bars in the graph

Exp. 12 a: Bar plots in R

```
>H <- c(7,12,28,3,41)
```

```
>M <- c("Mar","Apr","May","Jun","Jul")
```

```
>barplot(H, names.arg=M, xlab="Month",ylab="Revenue",  
        col="red", main="Revenue chart")
```



Exp. 12 a: Bar plots in R

```
H <- c(7,12,28,3,41)
```

```
M <- c("Mar","Apr","May","Jun","Jul")
```

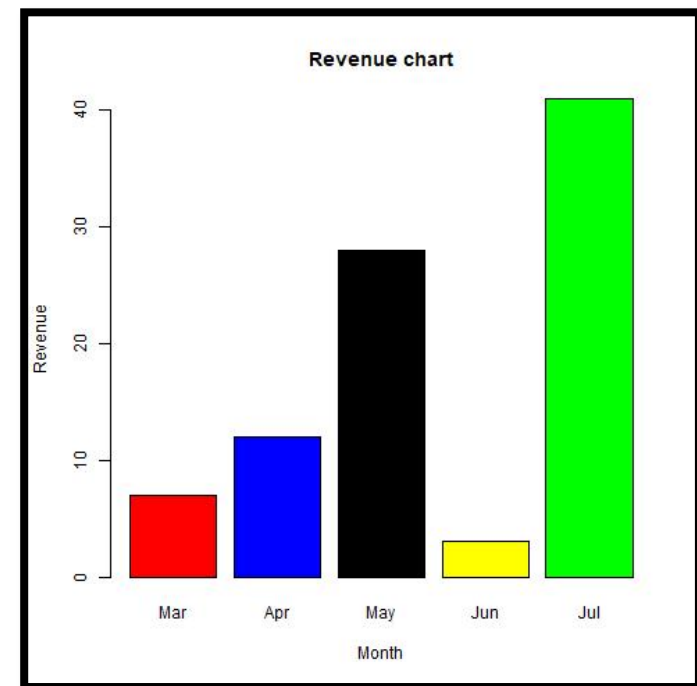
```
C <-c("red","blue","black","yellow","green")
```

```
jpeg(file="monthly_revenue.jpeg")
```

```
barplot(H, names.arg=M, xlab="Month",ylab="Revenue", col=C,  
main="Revenue chart")
```

```
dev.off()
```

#Jpeg image is created in the current working directory



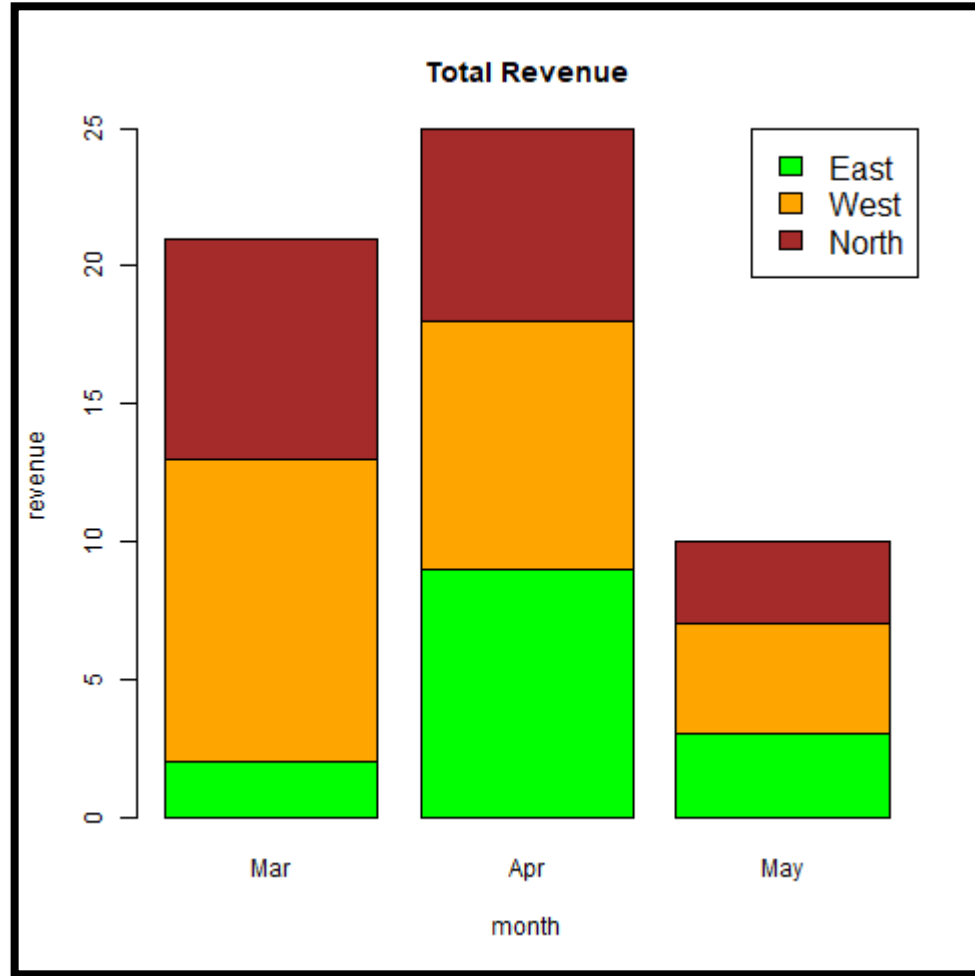
pdf / png

Exp. 12 a: Bar plots in R

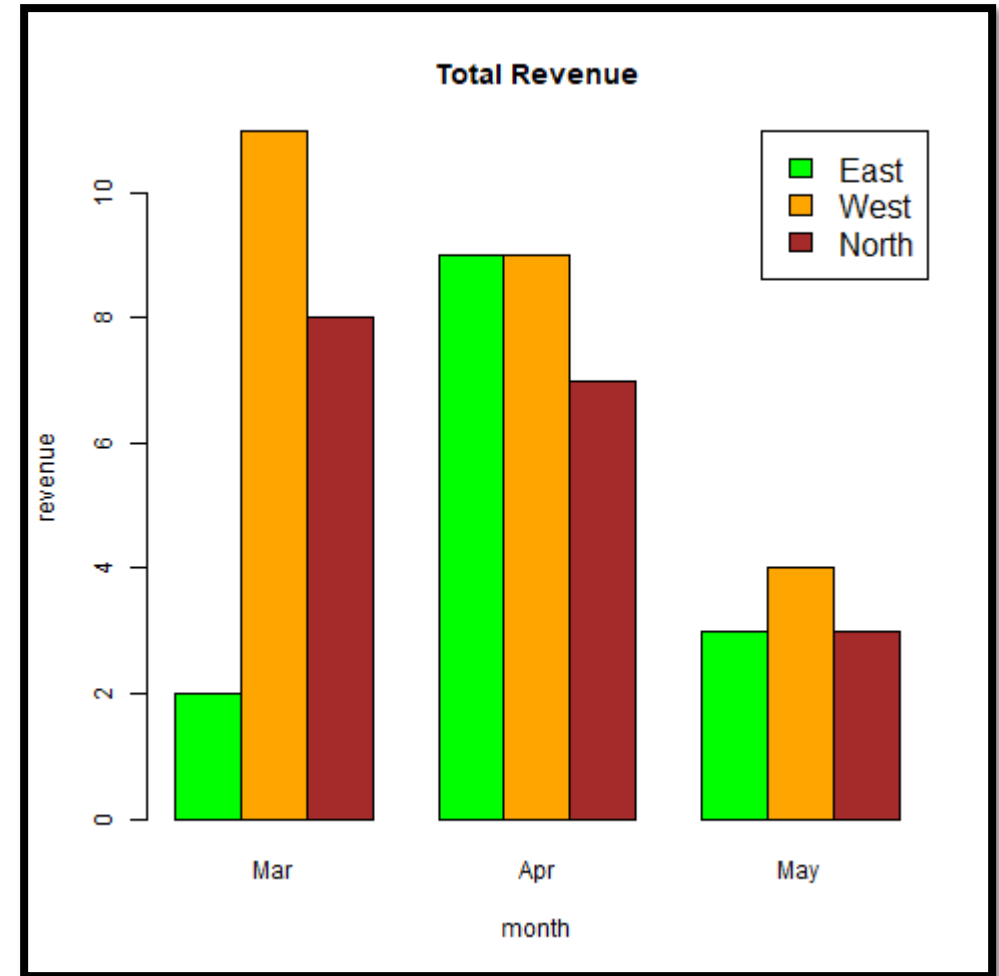
► Stacked Barplot / Grouped Barplot

```
colors = c("green","red","blue")
months = c("Mar","Apr","May")
regions = c("East","West","North")
values = matrix(c(2,9,3,11,9,4,8,7,3), nrow=3, byrow=TRUE)
png(file = "barchart_stack.png")
barplot(values, main="Total Revenue", names.arg=months,
xlab="month", ylab="revenue", col=colors)           #beside=TRUE
legend("topright", regions, cex = 1.3, fill=colors)
dev.off()
```

Exp. 12 a: Bar plots in R



Stacked



Grouped

Exp. 12 b: Pie charts in R

- ▶ A pie-chart is a representation of values as slices of a circle with different colors
- ▶ Syntax:

pie(x, labels, radius, main, col, clockwise)

x is a vector containing the numeric values used in the pie chart.

labels is used to give description to the slices.

radius indicates the radius of the circle of the pie chart.(-1 to $+1$).

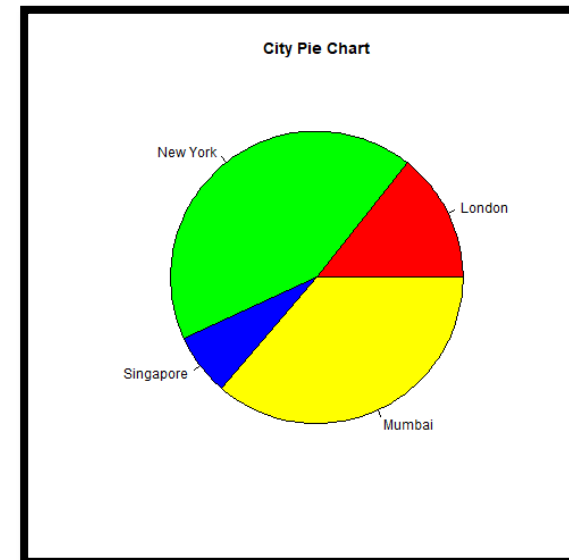
main indicates the title of the chart

col indicates the color palette

clockwise is a logical value indicating if the slices are drawn clockwise or anti clockwise.(default:FALSE)

Exp. 12 b: Pie charts in R

```
> x <- c(21, 62, 10, 53)
> labels <- c("London", "New York", "Singapore", "Mumbai")
> colors=c("red", "green", "blue", "yellow")
> png(file = "city.png")
> pie(x, labels, main = "City Pie Chart", col=colors)
> dev.off()
```



Exp. 12 c: Histograms in R

- ▶ A histogram represents the frequencies of values of a variable bucketed into ranges
- ▶ Histogram is similar to bar chart but the difference is it groups the values into continuous ranges

Exp. 12 c: Histograms in R

Syntax:

hist(v, main, xlab, xlim, ylim, breaks, col)

v is a vector containing numeric values used in histogram

main indicates title of the chart

xlab is used to give description of x-axis

xlim is used to specify the range of values on the x-axis

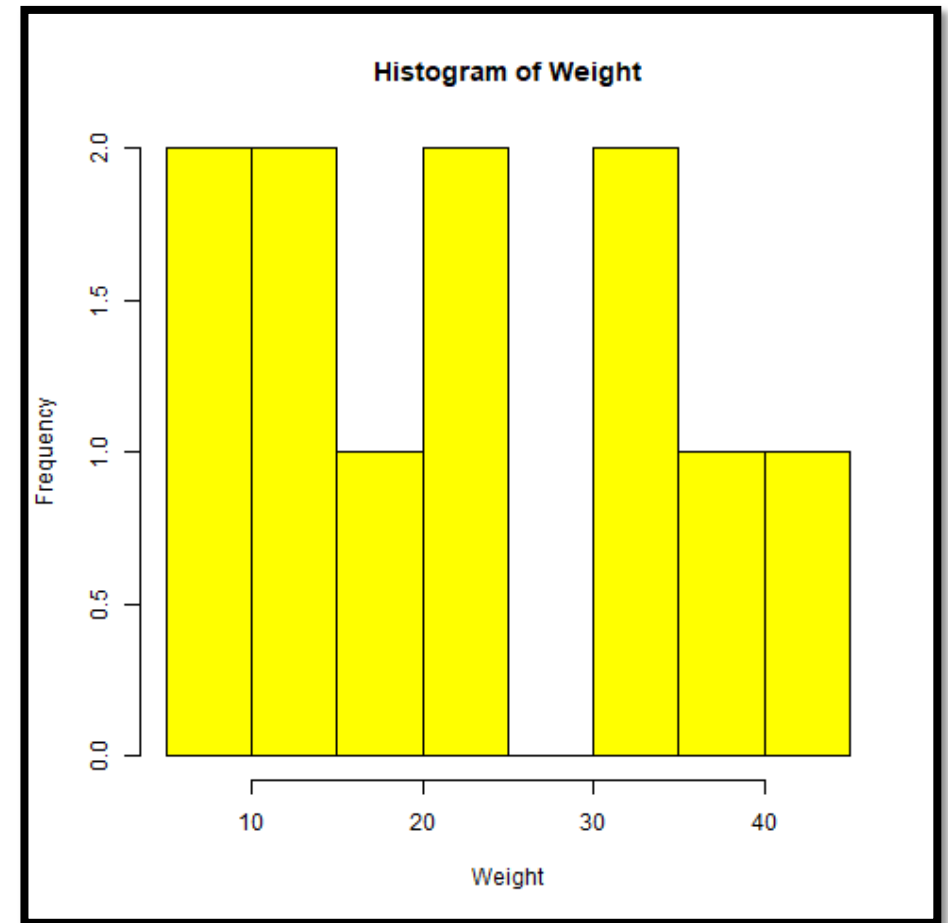
ylim is used to specify the range of values on the y-axis

breaks is used to mention the width of each bar

col is used to set color of the bars

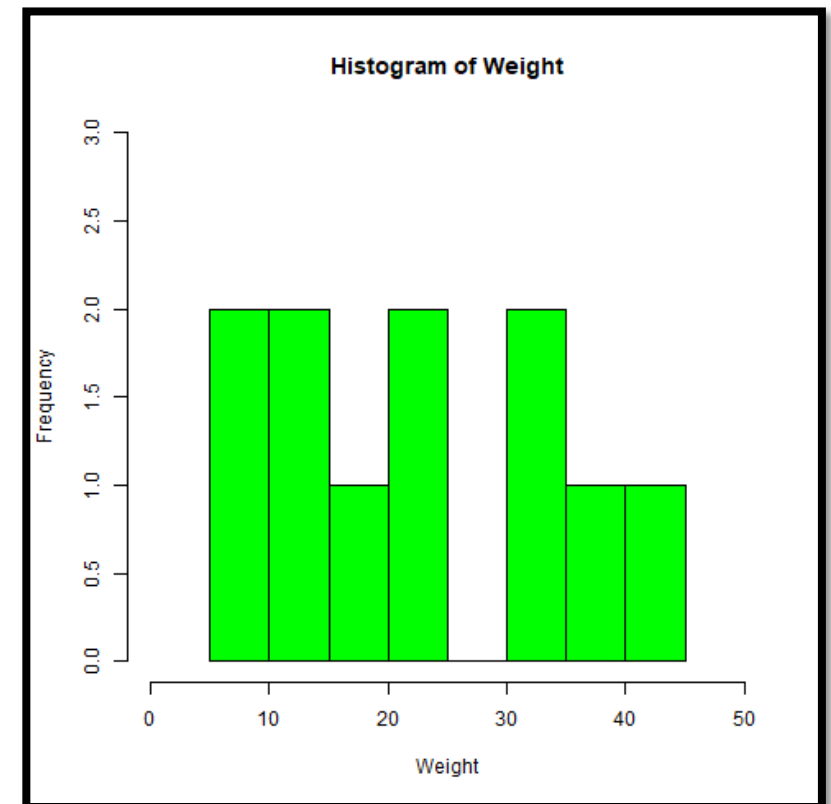
Exp. 12 c: Histograms in R

```
> Weight <- c(9,13,21,8,36,22,12,41,31,33,19)
> png(file = "histogram.png")
> hist(Weight, xlab = "Weight", col = "yellow")
> dev.off()
```



Exp. 12 c: Histograms in R

```
> Weight <- c(9,13,21,8,36,22,12,41,31,33,19)
> png(file = "hist_lims.png")
> hist(Weight,xlab="Weight",col="green",xlim =c(0,50),ylim=c(0,3),breaks=5)
> dev.off()
```

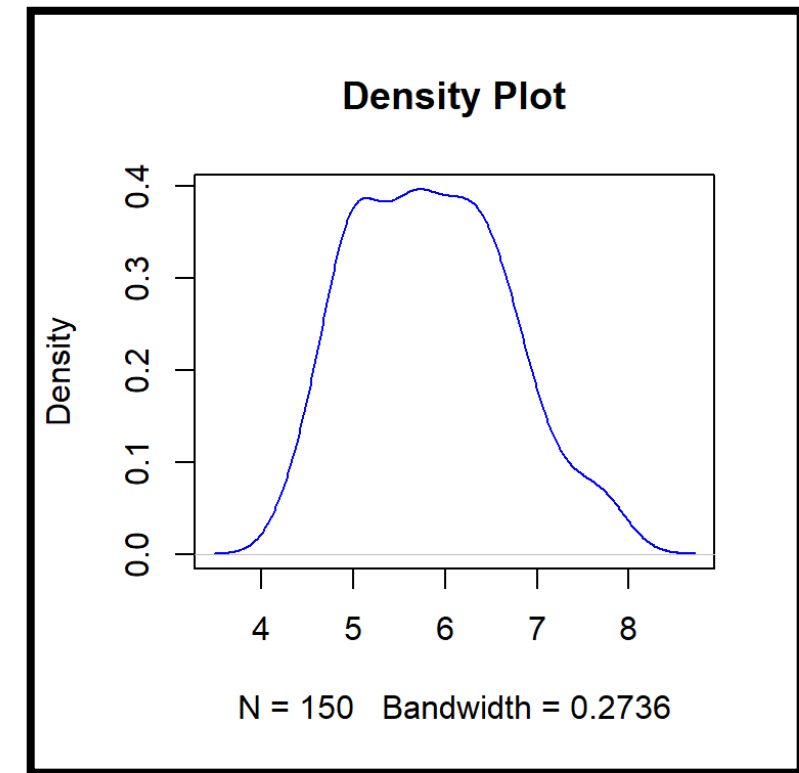


Exp. 12 d: Kernel Density plots in R

- ▶ **Kernel density plot** is a representation of the distribution of a numeric variable that uses a kernel density estimate to show the probability density function of the variable
- ▶ The `density()` function is used to compute kernel density estimates

```
> d=density(iris$Sepal.Length)
```

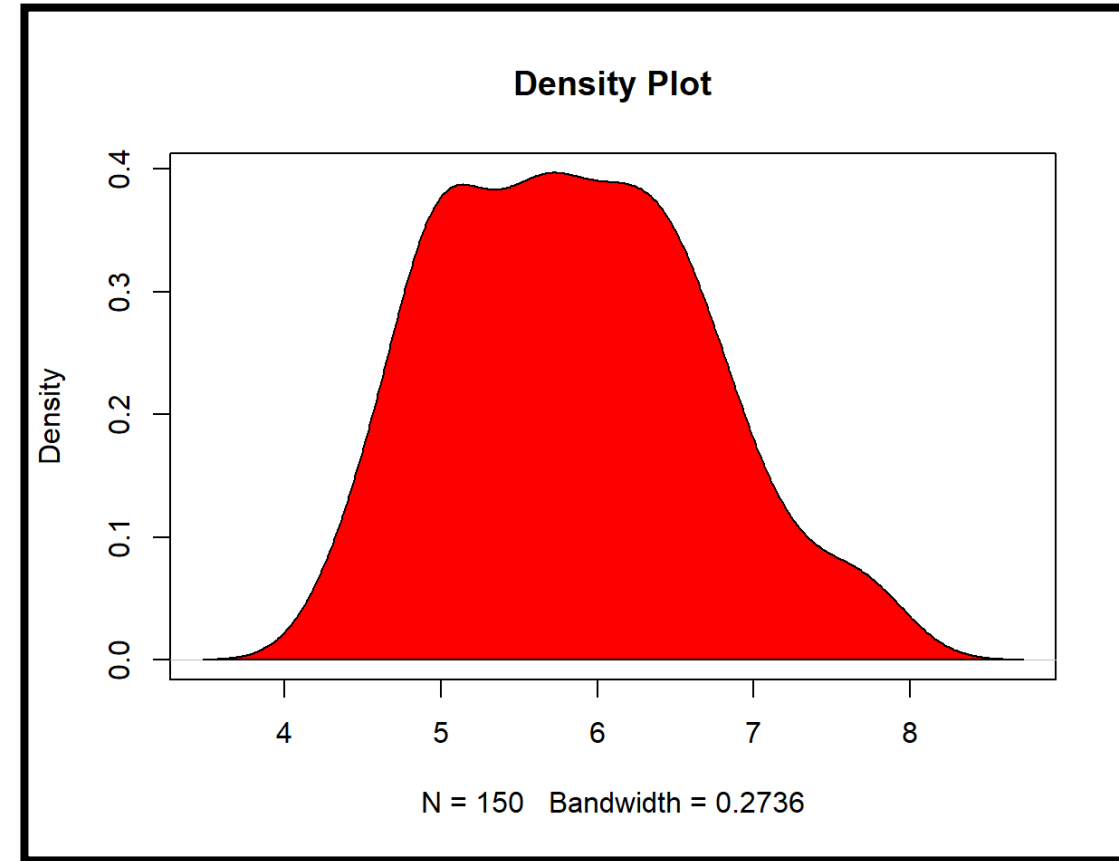
```
> plot(d, main="Density Plot",col="blue")
```



Exp. 12 d: Kernel Density plots in R

Filled density plot

```
> d=density(iris$Sepal.Length)  
> plot(d, main="Density Plot")  
> polygon(d, col="red")
```



Exp. 12 e: Boxplots in R

- ▶ Boxplots are a measure of how well distributed is the data in a data set. It divides the data set into three quartiles
- ▶ It represents the minimum, maximum, median, first quartile and third quartile in the data set

Exp. 12 e: Boxplots in R

Syntax:

boxplot(x, data, notch, names, main)

where

x is a vector or a single list

data is the data frame

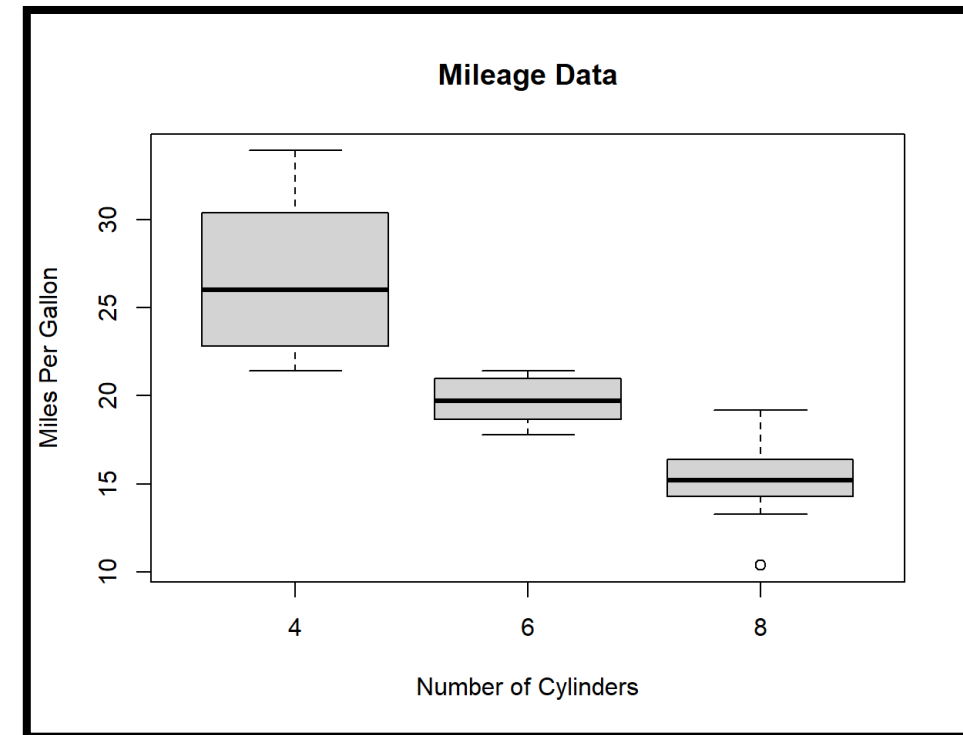
notch is a logical value, Set as TRUE to draw a notch.

names are the group labels to be printed under each boxplot

main is used to give a title to the graph

Exp. 12 e: Boxplots in R

```
#png(file = "box_plot.png")  
#print(summary(mtcars[1:2]))  
>boxplot(mpg ~ cyl, data = mtcars, xlab = "Number of Cylinders", ylab  
= "Miles Per Gallon", main="Mileage Data") #notch=TRUE  
#dev.off()
```



Exp. 12 f: Dotplots in R

- ▶ Renamed as Dotcharts, it draws a Cleveland dot plot
- ▶ They are an alternative to bar charts or pie charts
- ▶ They look somewhat like a horizontal bar chart where the bars are replaced by a dots at the values associated with each category
- ▶ Syntax:

dotchart(x, labels, cex, main, xlab)

where **x** is either a vector or matrix of numeric values

labels is a vector of labels for each point

cex is the character size to be used

main is used to give a title to the graph

xlab , ylab –x and y axis labels

Exp. 12 f: Dotplots in R

```
> dotchart(mtcars$mpg, labels=row.names(mtcars), cex=0.7, main="Gas  
Mileage for Car Models", xlab="Miles Per Gallon", ylab="Car Model")
```

