R Notebook

This is an R Markdown Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

This is the 2nd in series of R Code Files.

Refer the GitHub Repository , for all Code files —> https://github.com/RohitDhankar/R-Beginners-Online-Virtual-Learning-S

Its a good practice from time to time to keep a track of our current Working Directory and list out all the Objects in our R ENVIRONMENT - specially so when we are committing changes to a Git Remote.

VECTOR Operations

```
getwd()
```

```
## [1] "/home/dhankar/Desktop/R_Own/Proj_1"
#
ls()
```

```
## character(0)
```

We could remove any object with command - rm("Object Name")

We can also use print() , to view any objects stored value.

```
# Code Section -1
a1 <- "FINANCE"
b1 <- "MARKETING"
c1 <- "SALES"
d1 <- 3.1416
char_vector <- c("x","d","c","f")
print(a1)
```

```
## [1] "FINANCE"
#
print(char_vector)
```

```
## [1] "x" "d" "c" "f"
#
```

Going further with VECTORS .

We combine two or more vectors to get another vector .

```
# Code Section -2
num_vector <- c(22,22,33,33,44)
print(num_vector)
```

```
## [1] 22 22 33 33 44
```

```
num_vector1 <- c(11,12,13,14,15)
#
num_vector3 <- c(num_vector,num_vector1)
print(num_vector3)
```

[1] 22 22 33 33 44 11 12 13 14 15

Some basic Maths and Stats with VECTORS.

```
# Code Section -3
num_vector3 + 5
```

[1] 27 27 38 38 49 16 17 18 19 20

```
# Adds NUMERIC VALUE = 5 to all ELEMENTS of the Num Vector.
```

```
# Code Section -4

num_vector1 * num_vector3
```

[1] 242 264 429 462 660 121 144 169 196 225

```
# First 5 elements of - num_vector3 multiplied by the Five Elements
# of num_vector1 and again the Next 5 elements of num_vector3
# multiplied by the Five Elements of num_vector1
```

Check out the LENGTH of a VECTOR with length()

```
# Code Section -5

length(num_vector1 * num_vector3)
```

[1] 10

```
# Code Section -6

#num_vector1 %*% num_vector3 # Error in num_vector1 %*% num_vector3 : non-conformable arguments

# Vectors are not of same Length above - below they are of same length

nv <- c(1,2,3,4,5)
nv1 <- c(6,7,8,9,10)

nv %*% nv1 # Inner Product of same Length Vectors
```

```
##      [,1]
## [1,]  130
```

```
# Algeberic Dot Product as defined by WikiPedia - "https://en.wikipedia.org/wiki/Dot_product"
```

Operate upon a ELEMENT of the Vector.

```
# Code Section -7


log(num_vector3[2]) # Log Base 2 of 22
```

[1] 3.091042

```
#
log(22)
```

```
## [1] 3.091042
#
```

Converting a CHAR Vector into a NUMERIC Vector .

```r
# Code Section -8
ch_v <- c("11","12","13","14","15")
#
class(ch_v)
```

```
## [1] "character"
```

```r
#ch_v + 2 # Error in ch_v + 2 : non-numeric argument to binary operator
# Cant do a Math operation on CHAR Vector - lets Convert into NUM Vector
#
nm_v <- as.numeric(ch_v)
#
class(nm_v)
```

```
## [1] "numeric"
```

```r
nm_v + 2
```

```
## [1] 13 14 15 16 17
```

```r
#
#Summary of the Num Vector as below :-
#
summary(nm_v+2)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##      13      14      15      15      16      17
```

```r
#
summary(nm_v+5)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##      16      17      18      18      19      20
```

```r
#
sum(nm_v+5)
```

```
## [1] 90
```

```r
#
sd(nm_v+5)
```

```
## [1] 1.581139
```

```r
#
max(nm_v+5)
```

```
## [1] 20
```

```r
#
min(nm_v+5)
```

```
## [1] 16
```

```r
#
mean(nm_v+5)
```

```
## [1] 18
```

```r
#
median(nm_v+5)
```

```
## [1] 18
```

```r
#
#The Quantile -
#
quantile(nm_v+5)
```

```
##    0%   25%   50%   75% 100%
##    16    17    18    19    20
```

```r
#
quantile(nm_v+100)
```

```
##    0%   25%   50%   75% 100%
##   111   112   113   114   115
```

```r
#
#We can also specify the Quantile buckets or Percentiles as an argument to the Quantile function :-
#
nmv_q <- c(10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,90,100)
percent_1 <- quantile(nmv_q, c(.50,.75,.84, .97, .99))
percent_1
```

```
##    50%    75%    84%    97%    99%
## 52.50 73.75 81.40 94.90 98.30
```

```r
boxplot(percent_1,col = "red",horizontal = TRUE,
        main = "Box and Whisker Plot of Quantiles",
        xlab = "Quantile Values")
```

Box and Whisker Plot of Quantiles

Quantile Values
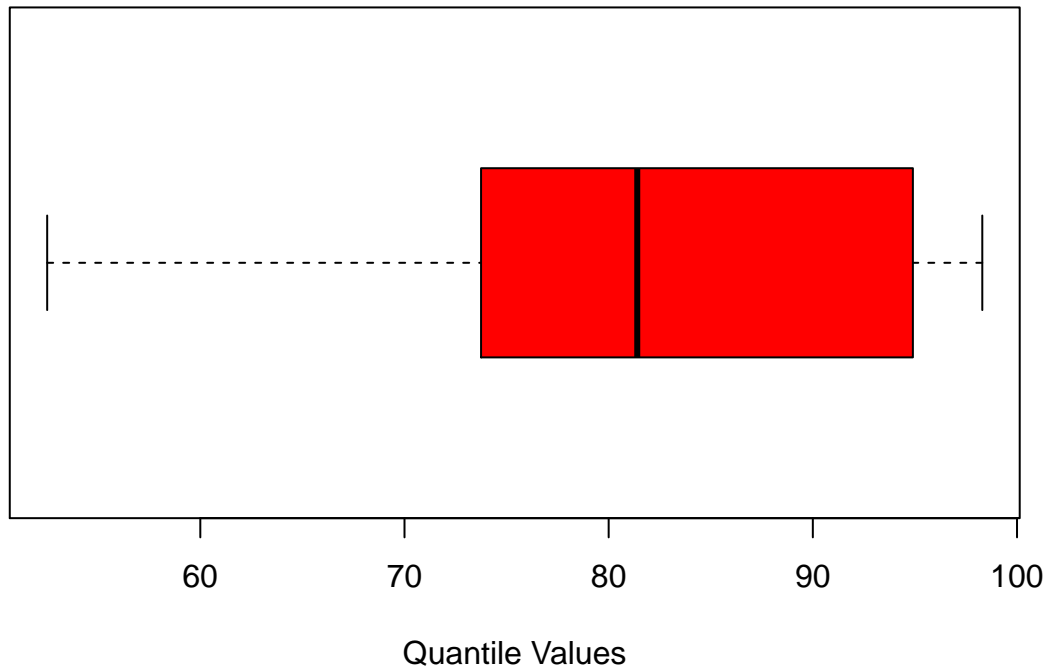
```
# Kindly note how the ARGUMENTs to boxplot()
# have been bumped to the next row - keeping in mind
# the Horizontal space of our PDF knit of the .Rmd file

# Seen above we have the MEDIAN quartile - 50% and the UPPER
# Quartile - 75% along with THREE more percentiles.
```

Wiki reference – Percentile Rank - "https://en.wikipedia.org/wiki/Percentile_rank" #

Intro to ANOVA and BOXPLOTS

We also carry out ONE Way ANOVA or ANALYSIS of VARIANCE test with the BOX and WHISKERS plots as seen below :-

```
# Code Section -9
library(graphics)

nmv_q <- c(10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,90,100)
percent_1 <- quantile(nmv_q, c(.50,.75,.84, .97, .99))
percent_1

##    50%   75%   84%   97%   99%
## 52.50 73.75 81.40 94.90 98.30

percent_2 <- quantile(nmv_q, c(.1, .3, .16, .40, .50))
percent_2

##  10%  30%  16%  40%  50%
## 18.5 35.5 23.6 44.0 52.5
```

```r
percent_3 <- quantile(nmv_q, c(.16, .40, .50,.75,.84))
percent_3
```

```
##    16%    40%    50%    75%    84%
## 23.60  44.00  52.50  73.75  81.40
```

```r
col_boxes = (c("red","blue","green"))

boxplot(percent_1,percent_2,percent_3,col = col_boxes,
        names = c("perc_1","perc_2","perc_3"),horizontal = TRUE,
        main = "Box and Whisker Plot of Quantiles",
        xlab = "Quantile Values")
```

Box and Whisker Plot of Quantiles

Quantile Values
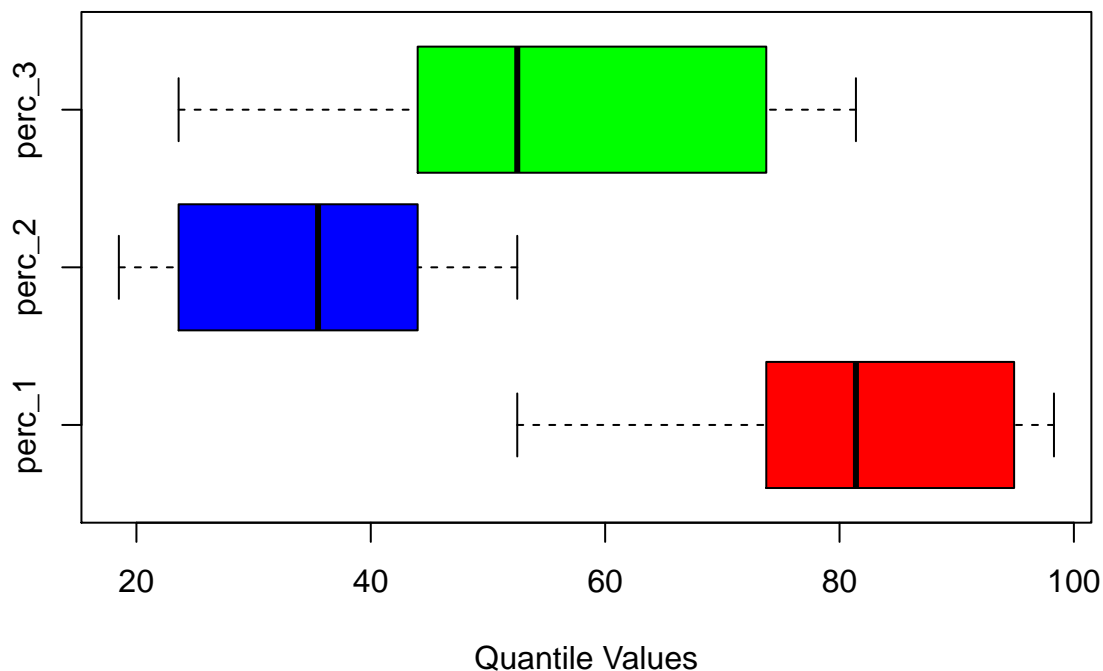
```r
# Kindly note the Quantiles are randomly chosen here
# this is not the best way to choose quantiles
# we shall come back for details later in this text
```

rainbow() for Coloring Boxplots -

```r
# Code Section -10

percent_4 <- quantile(nmv_q, c(.16, .40, .50,.95,.99))
percent_4
```

```
##  16%  40%  50%  95%  99%
## 23.6 44.0 52.5 91.5 98.3
```

```r
percent_5 <- quantile(nmv_q, c(.16, .24,.32 ,.40,.75))
percent_5
```

```
##    16%    24%    32%    40%    75%
## 23.60 30.40 37.20 44.00 73.75
```

```
percent_6 <- quantile(nmv_q, c(.1, .5, .26, .45, .60))
percent_6
```

```
##    10%    50%    26%    45%    60%
## 18.50 52.50 32.10 48.25 61.00
```

```
percent_7 <- quantile(nmv_q, c(.3, .7, .18, .43, .70))
percent_7
```

```
##    30%    70%    18%    43%    70%
## 35.50 69.50 25.30 46.55 69.50
```

```
col_rainbow <- rainbow(7)
```

```
boxplot(percent_1,percent_2,percent_3,percent_4,percent_5,percent_6,percent_7,col = col_rainbow,
        names = c("perc_1","perc_2","perc_3","perc_4","perc_5","perc_6","perc_7"),horizontal = TRUE,
        main = "Box and Whisker Plot of Quantiles",
        xlab = "Quantile Values")
```

Box and Whisker Plot of Quantiles
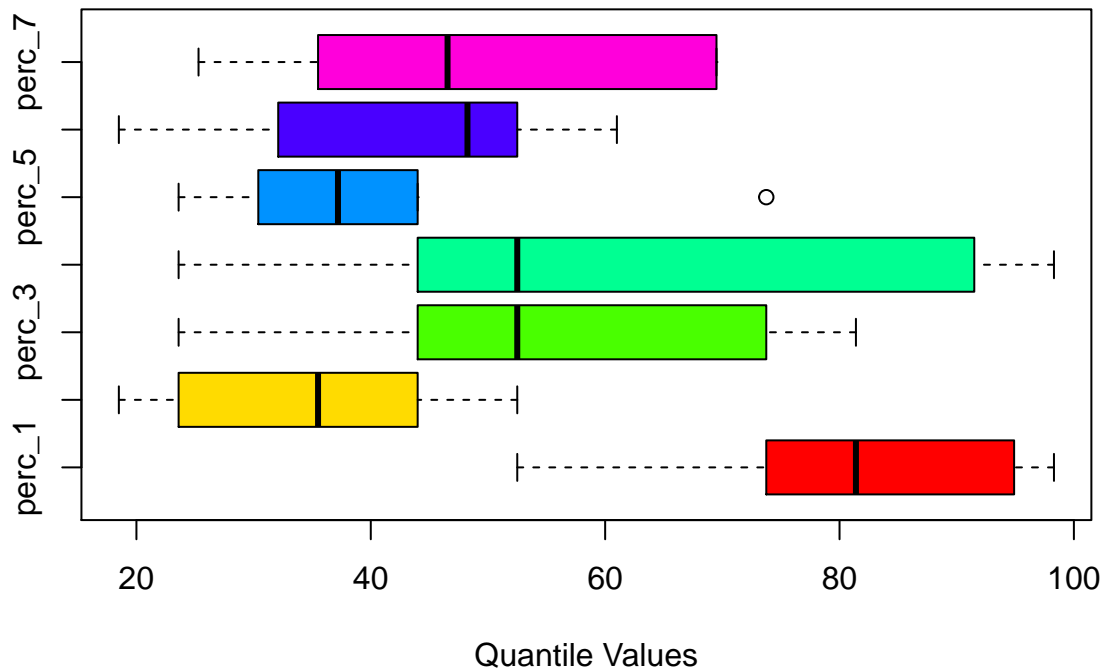

```
# Code Section -11

# Just for Fun a PIE Graph --- you always
# need to avoid PIE Graphs


pie(rep(1, 7), col = rainbow(7))
```

7
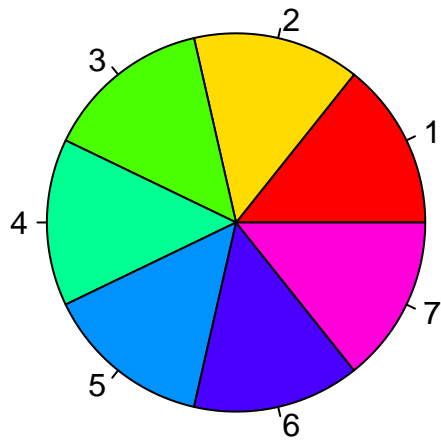
MATRICE Operations - TRANSPOSE of a MATRIX

Coming back to MATRICES lets further look at some MATRIX Operations :-

```
# Code Section -12

m1 <- matrix(data=66:69,nrow=2,ncol=2)
m1
```

```
##      [,1] [,2]
## [1,]   66   68
## [2,]   67   69
```

```
# Lets now TRANSPOSE this MATRIX - for more on TRANSPOSE of MATRICES
# kindly refer this Wiki Link -- https://en.wikipedia.org/wiki/Transpose


t(m1)
```

```
##      [,1] [,2]
## [1,]   66   67
## [2,]   68   69
```

```
# As seen below - the DIAGONAL Elements remain as -is .
# 66 and 69 do not move .
# 67 and 68 switch places , thus giving us a Transpose Matrix.

# Lets look at another example of TRANSPOSE ....

m2 <- matrix(data=10:25,nrow=4,ncol=4)
m2
```

```
##      [,1] [,2] [,3] [,4]
## [1,]   10   14   18   22
## [2,]   11   15   19   23
## [3,]   12   16   20   24
## [4,]   13   17   21   25
```

```
class(m2)
```

```
## [1] "matrix"
```

```
## Note  in the above sequence - 10:25 - both 10 and 25 are included.
# Lets now TRANSPOSE this MATRIX - for more on TRANSPOSE of MATRICES
# kindly refer this Wiki Link -- https://en.wikipedia.org/wiki/Transpose

t(m2)
```

```
##      [,1] [,2] [,3] [,4]
## [1,]   10   11   12   13
## [2,]   14   15   16   17
## [3,]   18   19   20   21
## [4,]   22   23   24   25
```

```
# As seen below - the DIAGONAL Elements remain as-is.
# 10, 15 , 20 , 25 -- do not move .
# Non Diagonal elements are Transposed ,giving the Transpose Matrix.
```

The Semicolon Notation - RANGE or SEQUENCE

```
# Code Section -13

# Quick recap of the SEQUENCE

a_seq <- 66:69
a_seq
```

```
## [1] 66 67 68 69
```

```
# In the earlier section we create a MATRIX by using a sequence within
# the COMBINE function

# We can also use the - seq - sequence function as seen below

b_seq <- seq(from=66, to=69, by=1)
b_seq
```

```
## [1] 66 67 68 69
```

```
#

b_seq <- seq(from=66, to=69, by=2)
b_seq
```

```
## [1] 66 68
```

```
#

c_seq <- seq(from=1, to=10, by=2)
c_seq
```

```
## [1] 1 3 5 7 9
```

```
class(c_seq)
```

```
## [1] "numeric"
```

The CBIND and RBIND Functions

We can COLUMN Bind and ROW Bind more than one data structures as seen below -

```
# Code Section -14

ma1 <- matrix(data=10:15,nrow=3,ncol=2)
ma1
```

```
##      [,1] [,2]
## [1,]   10   13
## [2,]   11   14
## [3,]   12   15
#
class(ma1)
```

```
## [1] "matrix"
#
ma2 <- matrix(data=20:25,nrow=3,ncol=2)
ma2
```

```
##      [,1] [,2]
## [1,]   20   23
## [2,]   21   24
## [3,]   22   25
#
class(ma2)
```

```
## [1] "matrix"
# ROW Bind the Matrices
ma3 <- rbind(ma1,ma2)
ma3
```

```
##      [,1] [,2]
## [1,]   10   13
## [2,]   11   14
## [3,]   12   15
## [4,]   20   23
## [5,]   21   24
## [6,]   22   25
#
# COLUMN Bind the Matrices
ma4 <- cbind(ma1,ma2)
ma4
```

```
##      [,1] [,2] [,3] [,4]
## [1,]   10   13   20   23
## [2,]   11   14   21   24
## [3,]   12   15   22   25
# As seen below we need to have same COLUMN Numbers to do a RBIND
#m3 <- rbind(m1,m2)

# # As seen below we need to have same ROW Numbers to do a RBIND
#m3 <- cbind(m1,m2)
```

ROW BIND - Data Frames

```
# Code Section -15

df_1 <- read.csv("~/Desktop/R_Own/R_1 - Sheet1.csv",header =TRUE , sep = "," )
df_1
```

```
##    X.     Product.Name         Prod.ID Date.of.Invoice Date.of.Shipping
## 1   1 OFF-LA-10002782 MX-2014-143658      01-01-2013       02-01-2013
## 2   2 FUR-FU-10004015 MX-2012-155047      01-01-2013       02-01-2013
## 3   3 FUR-BO-10002352 MX-2012-155047      01-01-2013       02-01-2013
## 4   4 OFF-BI-10004428 MX-2012-155047      01-01-2013       02-01-2013
## 5   5 OFF-AR-10004594 MX-2012-155047      01-01-2013       02-01-2013
## 6   6 OFF-EN-10001375 MX-2012-155047      01-01-2013       02-01-2013
## 7   7 OFF-EN-10001375 MX-2013-134096      01-01-2013       02-01-2013
## 8   8 TEC-MA-10004956 MX-2013-134096      01-01-2013       02-01-2013
## 9   9 OFF-SU-10003474 MX-2013-134096      01-01-2013       02-01-2013
## 10 10 TEC-AC-10001830 MX-2013-134096      01-01-2013       02-01-2013
## 11 11 OFF-BI-10002075 MX-2013-134096      01-01-2013       02-01-2013
## 12 12 OFF-FA-10002526 MX-2013-156335      01-01-2013       02-01-2013
## 13 13 FUR-CH-10002846 MX-2013-156335      01-01-2013       02-01-2013
## 14 14 OFF-EN-10004100 MX-2014-121923      02-01-2013       04-01-2013
## 15 15 OFF-AR-10003914 MX-2014-135706      02-01-2013       03-01-2013
## 16 16 OFF-FA-10000038 MX-2014-135706      02-01-2013       03-01-2013
## 17 17 OFF-EN-10000761 US-2013-126655      02-01-2013       03-01-2013
## 18 18 FUR-FU-10003066 US-2013-126655      02-01-2013       03-01-2013
## 19 19 OFF-EN-10000075 US-2013-126655      02-01-2013       03-01-2013
## 20 20 OFF-EN-10002226 US-2013-126655      02-01-2013       03-01-2013
## 21 21 FUR-CH-10002132 MX-2013-167759      02-01-2013       04-01-2013
## 22 22 TEC-AC-10002749 MX-2013-163139      02-01-2013       02-01-2013
## 23 23 OFF-SU-10000066 MX-2013-163139      02-01-2013       02-01-2013
## 24 24 OFF-BI-10003934 US-2014-119753      02-01-2013       03-01-2013
## 25 25 OFF-BI-10003932 US-2012-133970      02-01-2013       03-01-2013
##    Cost.Price Quantity Sales.Price Shipping.Index Shipping.Type
## 1      13.080        3      39.240              1      PRIORITY
## 2     252.160        8    2017.280              2      PRIORITY
## 3     193.280        2     386.560              3      PRIORITY
## 4      35.440        4     141.760              4      PRIORITY
## 5      71.600        2     143.200              5      PRIORITY
## 6      56.120        2     112.240              6      PRIORITY
## 7      56.120        2     112.240              7      STANDARD
## 8     344.640        3    1033.920              8      STANDARD
## 9      97.360        4     389.440              9      STANDARD
## 10    341.520        2     683.040             10      STANDARD
## 11     12.060        3      36.180             11      STANDARD
## 12     20.760        3      62.280             12      STANDARD
## 13    210.640        4     842.560             13      STANDARD
## 14     80.100        3     240.300             14      STANDARD
## 15    132.640        4     530.560             15      STANDARD
## 16     12.940        1      12.940             16      STANDARD
## 17     18.840        2      37.280             17      STANDARD
## 18    308.280        7    2157.560             18      STANDARD
## 19     40.176        2      79.952             19      STANDARD
```

```
## 20       8.784        3       25.952                20       PRIORITY
## 21     273.472        4     1093.688                21       PRIORITY
## 22      27.000        1       27.000                22       PRIORITY
## 23     207.000        9     1863.000                23       PRIORITY
## 24      60.660        3      181.580                24       PRIORITY
## 25     181.116        9     1629.644                25       PRIORITY
##              Category
## 1  Office Supplies
## 2         Furniture
## 3         Furniture
## 4  Office Supplies
## 5  Office Supplies
## 6  Office Supplies
## 7  Office Supplies
## 8        Technology
## 9  Office Supplies
## 10       Technology
## 11 Office Supplies
## 12 Office Supplies
## 13        Furniture
## 14 Office Supplies
## 15 Office Supplies
## 16 Office Supplies
## 17 Office Supplies
## 18        Furniture
## 19 Office Supplies
## 20 Office Supplies
## 21        Furniture
## 22       Technology
## 23 Office Supplies
## 24 Office Supplies
## 25 Office Supplies
```

```r
# Code Section -16

df_2 <- read.csv("~/Desktop/R_Own/R_2.csv",header =TRUE , sep = "," )
df_2
```

```
##     X.    Product.Name        Prod.ID Date.of.Invoice Date.of.Shipping
## 1    1 TEC-AC-10001830 MX-2013-134096      05-01-2013       06-01-2013
## 2    2 FUR-FU-10004015 MX-2012-155047      03-01-2013       03-01-2013
## 3    3 FUR-BO-10002352 MX-2012-155047      03-01-2013       03-01-2013
## 4    4 OFF-BI-10004428 MX-2012-155047      03-01-2013       03-01-2013
## 5    5 OFF-AR-10004594 MX-2012-155047      03-01-2013       03-01-2013
## 6    6 OFF-EN-10001375 MX-2012-155047      03-01-2013       03-01-2013
## 7    7 OFF-EN-10001375 MX-2013-134096      03-01-2013       04-01-2013
## 8    8 OFF-AR-10003914 MX-2014-135706      03-01-2013       04-01-2013
## 9    9 OFF-FA-10000038 MX-2014-135706      03-01-2013       04-01-2013
## 10  10 OFF-EN-10000761 US-2013-126655      03-01-2013       04-01-2013
## 11  11 FUR-FU-10003066 US-2013-126655      03-01-2013       04-01-2013
## 12  12 OFF-EN-10000075 US-2013-126655      03-01-2013       04-01-2013
## 13  13 OFF-EN-10002226 US-2013-126655      03-01-2013       03-01-2013
## 14  14 FUR-CH-10002132 MX-2013-167759      03-01-2013       03-01-2013
## 15  15 OFF-EN-10001375 MX-2013-134096      03-01-2013       04-01-2013
## 16  16 TEC-MA-10004956 MX-2013-134096      03-01-2013       04-01-2013
```

```
## 17 17 OFF-SU-10003474 MX-2013-134096      03-01-2013      04-01-2013
## 18 18 TEC-AC-10001830 MX-2013-134096      03-01-2013      04-01-2013
## 19 19 OFF-BI-10002075 MX-2013-134096      03-01-2013      04-01-2013
## 20 20 OFF-FA-10002526 MX-2013-156335      03-01-2013      04-01-2013
## 21 21 OFF-EN-10001375 MX-2013-134096      04-01-2013      05-01-2013
## 22 22 TEC-MA-10004956 MX-2013-134096      04-01-2013      05-01-2013
## 23 23 OFF-SU-10003474 MX-2013-134096      04-01-2013      05-01-2013
## 24 24 TEC-AC-10001830 MX-2013-134096      04-01-2013      05-01-2013
## 25 25 OFF-BI-10002075 MX-2013-134096      04-01-2013      05-01-2013
## 26 26 OFF-EN-10001375 MX-2013-134096      04-01-2013      05-01-2013
## 27 27 TEC-MA-10004956 MX-2013-134096      04-01-2013      05-01-2013
## 28 28 OFF-SU-10003474 MX-2013-134096      04-01-2013      05-01-2013
## 29 29 TEC-AC-10001830 MX-2013-134096      04-01-2013      05-01-2013
## 30 30 OFF-BI-10002075 MX-2013-134096      04-01-2013      05-01-2013
## 31 31 OFF-EN-10000761 US-2013-126655      04-01-2013      05-01-2013
## 32 32 FUR-FU-10003066 US-2013-126655      04-01-2013      05-01-2013
## 33 33 OFF-EN-10000075 US-2013-126655      04-01-2013      05-01-2013
## 34 34 OFF-EN-10002226 US-2013-126655      04-01-2013      04-01-2013
## 35 35 FUR-CH-10002132 MX-2013-167759      04-01-2013      04-01-2013
## 36 36 OFF-EN-10001375 MX-2013-134096      04-01-2013      05-01-2013
## 37 37 TEC-MA-10004956 MX-2013-134096      04-01-2013      05-01-2013
## 38 38 OFF-SU-10003474 MX-2013-134096      04-01-2013      05-01-2013
## 39 39 TEC-AC-10001830 MX-2013-134096      04-01-2013      05-01-2013
## 40 40 OFF-BI-10002075 MX-2013-134096      04-01-2013      05-01-2013
## 41 41 OFF-FA-10002526 MX-2013-156335      04-01-2013      05-01-2013
## 42 42 OFF-EN-10001375 MX-2013-134096      04-01-2013      05-01-2013
## 43 43 TEC-MA-10004956 MX-2013-134096      04-01-2013      05-01-2013
## 44 44 OFF-SU-10003474 MX-2013-134096      05-01-2013      06-01-2013
## 45 45 TEC-AC-10001830 MX-2013-134096      05-01-2013      06-01-2013
## 46 46 OFF-BI-10002075 MX-2013-134096      05-01-2013      06-01-2013
## 47 47 OFF-EN-10001375 MX-2013-134096      05-01-2013      06-01-2013
## 48 48 TEC-MA-10004956 MX-2013-134096      05-01-2013      06-01-2013
## 49 49 OFF-SU-10003474 MX-2013-134096      05-01-2013      06-01-2013
## 50 50 OFF-LA-10002782 MX-2014-143658      03-01-2013      03-01-2013
##      Cost.Price Quantity Sales.Price Shipping.Index Shipping.Type
## 1       341.520        2      683.040             10      STANDARD
## 2       252.160        8     2017.280              2      PRIORITY
## 3       193.280        2      386.560              3      PRIORITY
## 4        35.440        4      141.760              4      PRIORITY
## 5        71.600        2      143.200              5      PRIORITY
## 6        56.120        2      112.240              6      PRIORITY
## 7        56.120        2      112.240              7      STANDARD
## 8       132.640        4      530.560             15      STANDARD
## 9        12.940        1       12.940             16      STANDARD
## 10       18.840        2       37.280             17      STANDARD
## 11      308.280        7     2157.560             18      STANDARD
## 12       40.176        2       79.952             19      STANDARD
## 13        8.784        3       25.952             20      PRIORITY
## 14      273.472        4     1093.688             21      PRIORITY
## 15       56.120        2      112.240              7      STANDARD
## 16      344.640        3     1033.920              8      STANDARD
## 17       97.360        4      389.440              9      STANDARD
## 18      341.520        2      683.040             10      STANDARD
## 19       12.060        3       36.180             11      STANDARD
```

```
## 20    20.760    3     62.280     12    STANDARD
## 21    56.120    2    112.240      7    STANDARD
## 22   344.640    3   1033.920      8    STANDARD
## 23    97.360    4    389.440      9    STANDARD
## 24   341.520    2    683.040     10    STANDARD
## 25    12.060    3     36.180     11    STANDARD
## 26    56.120    2    112.240      7    STANDARD
## 27   344.640    3   1033.920      8    STANDARD
## 28    97.360    4    389.440      9    STANDARD
## 29   341.520    2    683.040     10    STANDARD
## 30    12.060    3     36.180     11    STANDARD
## 31    18.840    2     37.280     17    STANDARD
## 32   308.280    7   2157.560     18    STANDARD
## 33    40.176    2     79.952     19    STANDARD
## 34     8.784    3     25.952     20    PRIORITY
## 35   273.472    4   1093.688     21    PRIORITY
## 36    56.120    2    112.240      7    STANDARD
## 37   344.640    3   1033.920      8    STANDARD
## 38    97.360    4    389.440      9    STANDARD
## 39   341.520    2    683.040     10    STANDARD
## 40    12.060    3     36.180     11    STANDARD
## 41    20.760    3     62.280     12    STANDARD
## 42    56.120    2    112.240      7    STANDARD
## 43   344.640    3   1033.920      8    STANDARD
## 44    97.360    4    389.440      9    STANDARD
## 45   341.520    2    683.040     10    STANDARD
## 46    12.060    3     36.180     11    STANDARD
## 47    56.120    2    112.240      7    STANDARD
## 48   344.640    3   1033.920      8    STANDARD
## 49    97.360    4    389.440      9    STANDARD
## 50    13.080    3     39.240      1    PRIORITY
##              Category
## 1         Technology
## 2          Furniture
## 3          Furniture
## 4    Office Supplies
## 5    Office Supplies
## 6    Office Supplies
## 7    Office Supplies
## 8    Office Supplies
## 9    Office Supplies
## 10   Office Supplies
## 11         Furniture
## 12   Office Supplies
## 13   Office Supplies
## 14         Furniture
## 15   Office Supplies
## 16        Technology
## 17   Office Supplies
## 18        Technology
## 19   Office Supplies
## 20   Office Supplies
## 21   Office Supplies
## 22        Technology
```

```
## 23 Office Supplies
## 24         Technology
## 25 Office Supplies
## 26 Office Supplies
## 27         Technology
## 28 Office Supplies
## 29         Technology
## 30 Office Supplies
## 31 Office Supplies
## 32          Furniture
## 33 Office Supplies
## 34 Office Supplies
## 35          Furniture
## 36 Office Supplies
## 37         Technology
## 38 Office Supplies
## 39         Technology
## 40 Office Supplies
## 41 Office Supplies
## 42 Office Supplies
## 43         Technology
## 44 Office Supplies
## 45         Technology
## 46 Office Supplies
## 47 Office Supplies
## 48         Technology
## 49 Office Supplies
## 50 Office Supplies
```

COLUMN BIND- Data Frame

```r
# Code Section -17

df_3_C <- cbind(df_1,df_2)
df_3_C
```

```
##     X.    Product.Name         Prod.ID Date.of.Invoice Date.of.Shipping
## 1    1 OFF-LA-10002782 MX-2014-143658      01-01-2013       02-01-2013
## 2    2 FUR-FU-10004015 MX-2012-155047      01-01-2013       02-01-2013
## 3    3 FUR-BO-10002352 MX-2012-155047      01-01-2013       02-01-2013
## 4    4 OFF-BI-10004428 MX-2012-155047      01-01-2013       02-01-2013
## 5    5 OFF-AR-10004594 MX-2012-155047      01-01-2013       02-01-2013
## 6    6 OFF-EN-10001375 MX-2012-155047      01-01-2013       02-01-2013
## 7    7 OFF-EN-10001375 MX-2013-134096      01-01-2013       02-01-2013
## 8    8 TEC-MA-10004956 MX-2013-134096      01-01-2013       02-01-2013
## 9    9 OFF-SU-10003474 MX-2013-134096      01-01-2013       02-01-2013
## 10  10 TEC-AC-10001830 MX-2013-134096      01-01-2013       02-01-2013
## 11  11 OFF-BI-10002075 MX-2013-134096      01-01-2013       02-01-2013
## 12  12 OFF-FA-10002526 MX-2013-156335      01-01-2013       02-01-2013
## 13  13 FUR-CH-10002846 MX-2013-156335      01-01-2013       02-01-2013
## 14  14 OFF-EN-10004100 MX-2014-121923      02-01-2013       04-01-2013
## 15  15 OFF-AR-10003914 MX-2014-135706      02-01-2013       03-01-2013
```

```
## 16 16 OFF-FA-10000038 MX-2014-135706       02-01-2013       03-01-2013
## 17 17 OFF-EN-10000761 US-2013-126655       02-01-2013       03-01-2013
## 18 18 FUR-FU-10003066 US-2013-126655       02-01-2013       03-01-2013
## 19 19 OFF-EN-10000075 US-2013-126655       02-01-2013       03-01-2013
## 20 20 OFF-EN-10002226 US-2013-126655       02-01-2013       03-01-2013
## 21 21 FUR-CH-10002132 MX-2013-167759       02-01-2013       04-01-2013
## 22 22 TEC-AC-10002749 MX-2013-163139       02-01-2013       02-01-2013
## 23 23 OFF-SU-10000066 MX-2013-163139       02-01-2013       02-01-2013
## 24 24 OFF-BI-10003934 US-2014-119753       02-01-2013       03-01-2013
## 25 25 OFF-BI-10003932 US-2012-133970       02-01-2013       03-01-2013
## 26  1 OFF-LA-10002782 MX-2014-143658       01-01-2013       02-01-2013
## 27  2 FUR-FU-10004015 MX-2012-155047       01-01-2013       02-01-2013
## 28  3 FUR-BO-10002352 MX-2012-155047       01-01-2013       02-01-2013
## 29  4 OFF-BI-10004428 MX-2012-155047       01-01-2013       02-01-2013
## 30  5 OFF-AR-10004594 MX-2012-155047       01-01-2013       02-01-2013
## 31  6 OFF-EN-10001375 MX-2012-155047       01-01-2013       02-01-2013
## 32  7 OFF-EN-10001375 MX-2013-134096       01-01-2013       02-01-2013
## 33  8 TEC-MA-10004956 MX-2013-134096       01-01-2013       02-01-2013
## 34  9 OFF-SU-10003474 MX-2013-134096       01-01-2013       02-01-2013
## 35 10 TEC-AC-10001830 MX-2013-134096       01-01-2013       02-01-2013
## 36 11 OFF-BI-10002075 MX-2013-134096       01-01-2013       02-01-2013
## 37 12 OFF-FA-10002526 MX-2013-156335       01-01-2013       02-01-2013
## 38 13 FUR-CH-10002846 MX-2013-156335       01-01-2013       02-01-2013
## 39 14 OFF-EN-10004100 MX-2014-121923       02-01-2013       04-01-2013
## 40 15 OFF-AR-10003914 MX-2014-135706       02-01-2013       03-01-2013
## 41 16 OFF-FA-10000038 MX-2014-135706       02-01-2013       03-01-2013
## 42 17 OFF-EN-10000761 US-2013-126655       02-01-2013       03-01-2013
## 43 18 FUR-FU-10003066 US-2013-126655       02-01-2013       03-01-2013
## 44 19 OFF-EN-10000075 US-2013-126655       02-01-2013       03-01-2013
## 45 20 OFF-EN-10002226 US-2013-126655       02-01-2013       03-01-2013
## 46 21 FUR-CH-10002132 MX-2013-167759       02-01-2013       04-01-2013
## 47 22 TEC-AC-10002749 MX-2013-163139       02-01-2013       02-01-2013
## 48 23 OFF-SU-10000066 MX-2013-163139       02-01-2013       02-01-2013
## 49 24 OFF-BI-10003934 US-2014-119753       02-01-2013       03-01-2013
## 50 25 OFF-BI-10003932 US-2012-133970       02-01-2013       03-01-2013
##    Cost.Price Quantity Sales.Price Shipping.Index Shipping.Type
## 1      13.080        3      39.240              1     PRIORITY
## 2     252.160        8    2017.280              2     PRIORITY
## 3     193.280        2     386.560              3     PRIORITY
## 4      35.440        4     141.760              4     PRIORITY
## 5      71.600        2     143.200              5     PRIORITY
## 6      56.120        2     112.240              6     PRIORITY
## 7      56.120        2     112.240              7     STANDARD
## 8     344.640        3    1033.920              8     STANDARD
## 9      97.360        4     389.440              9     STANDARD
## 10    341.520        2     683.040             10     STANDARD
## 11     12.060        3      36.180             11     STANDARD
## 12     20.760        3      62.280             12     STANDARD
## 13    210.640        4     842.560             13     STANDARD
## 14     80.100        3     240.300             14     STANDARD
## 15    132.640        4     530.560             15     STANDARD
## 16     12.940        1      12.940             16     STANDARD
## 17     18.840        2      37.280             17     STANDARD
## 18    308.280        7    2157.560             18     STANDARD
```

```
## 19      40.176     2     79.952            19       STANDARD
## 20       8.784     3     25.952            20       PRIORITY
## 21     273.472     4   1093.688            21       PRIORITY
## 22      27.000     1     27.000            22       PRIORITY
## 23     207.000     9   1863.000            23       PRIORITY
## 24      60.660     3    181.580            24       PRIORITY
## 25     181.116     9   1629.644            25       PRIORITY
## 26      13.080     3     39.240             1       PRIORITY
## 27     252.160     8   2017.280             2       PRIORITY
## 28     193.280     2    386.560             3       PRIORITY
## 29      35.440     4    141.760             4       PRIORITY
## 30      71.600     2    143.200             5       PRIORITY
## 31      56.120     2    112.240             6       PRIORITY
## 32      56.120     2    112.240             7       STANDARD
## 33     344.640     3   1033.920             8       STANDARD
## 34      97.360     4    389.440             9       STANDARD
## 35     341.520     2    683.040            10       STANDARD
## 36      12.060     3     36.180            11       STANDARD
## 37      20.760     3     62.280            12       STANDARD
## 38     210.640     4    842.560            13       STANDARD
## 39      80.100     3    240.300            14       STANDARD
## 40     132.640     4    530.560            15       STANDARD
## 41      12.940     1     12.940            16       STANDARD
## 42      18.840     2     37.280            17       STANDARD
## 43     308.280     7   2157.560            18       STANDARD
## 44      40.176     2     79.952            19       STANDARD
## 45       8.784     3     25.952            20       PRIORITY
## 46     273.472     4   1093.688            21       PRIORITY
## 47      27.000     1     27.000            22       PRIORITY
## 48     207.000     9   1863.000            23       PRIORITY
## 49      60.660     3    181.580            24       PRIORITY
## 50     181.116     9   1629.644            25       PRIORITY
##              Category X.   Product.Name         Prod.ID Date.of.Invoice
## 1  Office Supplies  1 TEC-AC-10001830 MX-2013-134096      05-01-2013
## 2         Furniture  2 FUR-FU-10004015 MX-2012-155047      03-01-2013
## 3         Furniture  3 FUR-BO-10002352 MX-2012-155047      03-01-2013
## 4  Office Supplies  4 OFF-BI-10004428 MX-2012-155047      03-01-2013
## 5  Office Supplies  5 OFF-AR-10004594 MX-2012-155047      03-01-2013
## 6  Office Supplies  6 OFF-EN-10001375 MX-2012-155047      03-01-2013
## 7  Office Supplies  7 OFF-EN-10001375 MX-2013-134096      03-01-2013
## 8         Technology  8 OFF-AR-10003914 MX-2014-135706      03-01-2013
## 9  Office Supplies  9 OFF-FA-10000038 MX-2014-135706      03-01-2013
## 10        Technology 10 OFF-EN-10000761 US-2013-126655      03-01-2013
## 11 Office Supplies 11 FUR-FU-10003066 US-2013-126655      03-01-2013
## 12 Office Supplies 12 OFF-EN-10000075 US-2013-126655      03-01-2013
## 13        Furniture 13 OFF-EN-10002226 US-2013-126655      03-01-2013
## 14 Office Supplies 14 FUR-CH-10002132 MX-2013-167759      03-01-2013
## 15 Office Supplies 15 OFF-EN-10001375 MX-2013-134096      03-01-2013
## 16 Office Supplies 16 TEC-MA-10004956 MX-2013-134096      03-01-2013
## 17 Office Supplies 17 OFF-SU-10003474 MX-2013-134096      03-01-2013
## 18        Furniture 18 TEC-AC-10001830 MX-2013-134096      03-01-2013
## 19 Office Supplies 19 OFF-BI-10002075 MX-2013-134096      03-01-2013
## 20 Office Supplies 20 OFF-FA-10002526 MX-2013-156335      03-01-2013
## 21        Furniture 21 OFF-EN-10001375 MX-2013-134096      04-01-2013
```

```
## 22        Technology 22 TEC-MA-10004956 MX-2013-134096        04-01-2013
## 23 Office Supplies 23 OFF-SU-10003474 MX-2013-134096        04-01-2013
## 24 Office Supplies 24 TEC-AC-10001830 MX-2013-134096        04-01-2013
## 25 Office Supplies 25 OFF-BI-10002075 MX-2013-134096        04-01-2013
## 26 Office Supplies 26 OFF-EN-10001375 MX-2013-134096        04-01-2013
## 27         Furniture 27 TEC-MA-10004956 MX-2013-134096        04-01-2013
## 28         Furniture 28 OFF-SU-10003474 MX-2013-134096        04-01-2013
## 29 Office Supplies 29 TEC-AC-10001830 MX-2013-134096        04-01-2013
## 30 Office Supplies 30 OFF-BI-10002075 MX-2013-134096        04-01-2013
## 31 Office Supplies 31 OFF-EN-10000761 US-2013-126655        04-01-2013
## 32 Office Supplies 32 FUR-FU-10003066 US-2013-126655        04-01-2013
## 33        Technology 33 OFF-EN-10000075 US-2013-126655        04-01-2013
## 34 Office Supplies 34 OFF-EN-10002226 US-2013-126655        04-01-2013
## 35        Technology 35 FUR-CH-10002132 MX-2013-167759        04-01-2013
## 36 Office Supplies 36 OFF-EN-10001375 MX-2013-134096        04-01-2013
## 37 Office Supplies 37 TEC-MA-10004956 MX-2013-134096        04-01-2013
## 38         Furniture 38 OFF-SU-10003474 MX-2013-134096        04-01-2013
## 39 Office Supplies 39 TEC-AC-10001830 MX-2013-134096        04-01-2013
## 40 Office Supplies 40 OFF-BI-10002075 MX-2013-134096        04-01-2013
## 41 Office Supplies 41 OFF-FA-10002526 MX-2013-156335        04-01-2013
## 42 Office Supplies 42 OFF-EN-10001375 MX-2013-134096        04-01-2013
## 43         Furniture 43 TEC-MA-10004956 MX-2013-134096        04-01-2013
## 44 Office Supplies 44 OFF-SU-10003474 MX-2013-134096        05-01-2013
## 45 Office Supplies 45 TEC-AC-10001830 MX-2013-134096        05-01-2013
## 46         Furniture 46 OFF-BI-10002075 MX-2013-134096        05-01-2013
## 47        Technology 47 OFF-EN-10001375 MX-2013-134096        05-01-2013
## 48 Office Supplies 48 TEC-MA-10004956 MX-2013-134096        05-01-2013
## 49 Office Supplies 49 OFF-SU-10003474 MX-2013-134096        05-01-2013
## 50 Office Supplies 50 OFF-LA-10002782 MX-2014-143658        03-01-2013
##    Date.of.Shipping Cost.Price Quantity Sales.Price Shipping.Index
## 1        06-01-2013    341.520        2     683.040             10
## 2        03-01-2013    252.160        8    2017.280              2
## 3        03-01-2013    193.280        2     386.560              3
## 4        03-01-2013     35.440        4     141.760              4
## 5        03-01-2013     71.600        2     143.200              5
## 6        03-01-2013     56.120        2     112.240              6
## 7        04-01-2013     56.120        2     112.240              7
## 8        04-01-2013    132.640        4     530.560             15
## 9        04-01-2013     12.940        1      12.940             16
## 10       04-01-2013     18.840        2      37.280             17
## 11       04-01-2013    308.280        7    2157.560             18
## 12       04-01-2013     40.176        2      79.952             19
## 13       03-01-2013      8.784        3      25.952             20
## 14       03-01-2013    273.472        4    1093.688             21
## 15       04-01-2013     56.120        2     112.240              7
## 16       04-01-2013    344.640        3    1033.920              8
## 17       04-01-2013     97.360        4     389.440              9
## 18       04-01-2013    341.520        2     683.040             10
## 19       04-01-2013     12.060        3      36.180             11
## 20       04-01-2013     20.760        3      62.280             12
## 21       05-01-2013     56.120        2     112.240              7
## 22       05-01-2013    344.640        3    1033.920              8
## 23       05-01-2013     97.360        4     389.440              9
## 24       05-01-2013    341.520        2     683.040             10
```

```
## 25        05-01-2013       12.060    3      36.180          11
## 26        05-01-2013       56.120    2     112.240           7
## 27        05-01-2013      344.640    3    1033.920           8
## 28        05-01-2013       97.360    4     389.440           9
## 29        05-01-2013      341.520    2     683.040          10
## 30        05-01-2013       12.060    3      36.180          11
## 31        05-01-2013       18.840    2      37.280          17
## 32        05-01-2013      308.280    7    2157.560          18
## 33        05-01-2013       40.176    2      79.952          19
## 34        04-01-2013        8.784    3      25.952          20
## 35        04-01-2013      273.472    4    1093.688          21
## 36        05-01-2013       56.120    2     112.240           7
## 37        05-01-2013      344.640    3    1033.920           8
## 38        05-01-2013       97.360    4     389.440           9
## 39        05-01-2013      341.520    2     683.040          10
## 40        05-01-2013       12.060    3      36.180          11
## 41        05-01-2013       20.760    3      62.280          12
## 42        05-01-2013       56.120    2     112.240           7
## 43        05-01-2013      344.640    3    1033.920           8
## 44        06-01-2013       97.360    4     389.440           9
## 45        06-01-2013      341.520    2     683.040          10
## 46        06-01-2013       12.060    3      36.180          11
## 47        06-01-2013       56.120    2     112.240           7
## 48        06-01-2013      344.640    3    1033.920           8
## 49        06-01-2013       97.360    4     389.440           9
## 50        03-01-2013       13.080    3      39.240           1
##     Shipping.Type        Category
## 1        STANDARD      Technology
## 2        PRIORITY       Furniture
## 3        PRIORITY       Furniture
## 4        PRIORITY Office Supplies
## 5        PRIORITY Office Supplies
## 6        PRIORITY Office Supplies
## 7        STANDARD Office Supplies
## 8        STANDARD Office Supplies
## 9        STANDARD Office Supplies
## 10       STANDARD Office Supplies
## 11       STANDARD       Furniture
## 12       STANDARD Office Supplies
## 13       PRIORITY Office Supplies
## 14       PRIORITY       Furniture
## 15       STANDARD Office Supplies
## 16       STANDARD      Technology
## 17       STANDARD Office Supplies
## 18       STANDARD      Technology
## 19       STANDARD Office Supplies
## 20       STANDARD Office Supplies
## 21       STANDARD Office Supplies
## 22       STANDARD      Technology
## 23       STANDARD Office Supplies
## 24       STANDARD      Technology
## 25       STANDARD Office Supplies
## 26       STANDARD Office Supplies
## 27       STANDARD      Technology
```

```
## 28       STANDARD Office Supplies
## 29       STANDARD      Technology
## 30       STANDARD Office Supplies
## 31       STANDARD Office Supplies
## 32       STANDARD      Furniture
## 33       STANDARD Office Supplies
## 34       PRIORITY Office Supplies
## 35       PRIORITY      Furniture
## 36       STANDARD Office Supplies
## 37       STANDARD      Technology
## 38       STANDARD Office Supplies
## 39       STANDARD      Technology
## 40       STANDARD Office Supplies
## 41       STANDARD Office Supplies
## 42       STANDARD Office Supplies
## 43       STANDARD      Technology
## 44       STANDARD Office Supplies
## 45       STANDARD      Technology
## 46       STANDARD Office Supplies
## 47       STANDARD Office Supplies
## 48       STANDARD      Technology
## 49       STANDARD Office Supplies
## 50       PRIORITY Office Supplies
```

ROW BIND - Data Frame

```
# Code Section -18

df_3_R <- rbind(df_2,df_1)
df_3_R
```

```
##     X.    Product.Name        Prod.ID Date.of.Invoice Date.of.Shipping
## 1    1 TEC-AC-10001830 MX-2013-134096      05-01-2013       06-01-2013
## 2    2 FUR-FU-10004015 MX-2012-155047      03-01-2013       03-01-2013
## 3    3 FUR-BO-10002352 MX-2012-155047      03-01-2013       03-01-2013
## 4    4 OFF-BI-10004428 MX-2012-155047      03-01-2013       03-01-2013
## 5    5 OFF-AR-10004594 MX-2012-155047      03-01-2013       03-01-2013
## 6    6 OFF-EN-10001375 MX-2012-155047      03-01-2013       03-01-2013
## 7    7 OFF-EN-10001375 MX-2013-134096      03-01-2013       04-01-2013
## 8    8 OFF-AR-10003914 MX-2014-135706      03-01-2013       04-01-2013
## 9    9 OFF-FA-10000038 MX-2014-135706      03-01-2013       04-01-2013
## 10 10 OFF-EN-10000761 US-2013-126655      03-01-2013       04-01-2013
## 11 11 FUR-FU-10003066 US-2013-126655      03-01-2013       04-01-2013
## 12 12 OFF-EN-10000075 US-2013-126655      03-01-2013       04-01-2013
## 13 13 OFF-EN-10002226 US-2013-126655      03-01-2013       03-01-2013
## 14 14 FUR-CH-10002132 MX-2013-167759      03-01-2013       03-01-2013
## 15 15 OFF-EN-10001375 MX-2013-134096      03-01-2013       04-01-2013
## 16 16 TEC-MA-10004956 MX-2013-134096      03-01-2013       04-01-2013
## 17 17 OFF-SU-10003474 MX-2013-134096      03-01-2013       04-01-2013
## 18 18 TEC-AC-10001830 MX-2013-134096      03-01-2013       04-01-2013
## 19 19 OFF-BI-10002075 MX-2013-134096      03-01-2013       04-01-2013
## 20 20 OFF-FA-10002526 MX-2013-156335      03-01-2013       04-01-2013
```

```
## 21 21 OFF-EN-10001375 MX-2013-134096       04-01-2013        05-01-2013
## 22 22 TEC-MA-10004956 MX-2013-134096       04-01-2013        05-01-2013
## 23 23 OFF-SU-10003474 MX-2013-134096       04-01-2013        05-01-2013
## 24 24 TEC-AC-10001830 MX-2013-134096       04-01-2013        05-01-2013
## 25 25 OFF-BI-10002075 MX-2013-134096       04-01-2013        05-01-2013
## 26 26 OFF-EN-10001375 MX-2013-134096       04-01-2013        05-01-2013
## 27 27 TEC-MA-10004956 MX-2013-134096       04-01-2013        05-01-2013
## 28 28 OFF-SU-10003474 MX-2013-134096       04-01-2013        05-01-2013
## 29 29 TEC-AC-10001830 MX-2013-134096       04-01-2013        05-01-2013
## 30 30 OFF-BI-10002075 MX-2013-134096       04-01-2013        05-01-2013
## 31 31 OFF-EN-10000761 US-2013-126655       04-01-2013        05-01-2013
## 32 32 FUR-FU-10003066 US-2013-126655       04-01-2013        05-01-2013
## 33 33 OFF-EN-10000075 US-2013-126655       04-01-2013        05-01-2013
## 34 34 OFF-EN-10002226 US-2013-126655       04-01-2013        04-01-2013
## 35 35 FUR-CH-10002132 MX-2013-167759       04-01-2013        04-01-2013
## 36 36 OFF-EN-10001375 MX-2013-134096       04-01-2013        05-01-2013
## 37 37 TEC-MA-10004956 MX-2013-134096       04-01-2013        05-01-2013
## 38 38 OFF-SU-10003474 MX-2013-134096       04-01-2013        05-01-2013
## 39 39 TEC-AC-10001830 MX-2013-134096       04-01-2013        05-01-2013
## 40 40 OFF-BI-10002075 MX-2013-134096       04-01-2013        05-01-2013
## 41 41 OFF-FA-10002526 MX-2013-156335       04-01-2013        05-01-2013
## 42 42 OFF-EN-10001375 MX-2013-134096       04-01-2013        05-01-2013
## 43 43 TEC-MA-10004956 MX-2013-134096       04-01-2013        05-01-2013
## 44 44 OFF-SU-10003474 MX-2013-134096       05-01-2013        06-01-2013
## 45 45 TEC-AC-10001830 MX-2013-134096       05-01-2013        06-01-2013
## 46 46 OFF-BI-10002075 MX-2013-134096       05-01-2013        06-01-2013
## 47 47 OFF-EN-10001375 MX-2013-134096       05-01-2013        06-01-2013
## 48 48 TEC-MA-10004956 MX-2013-134096       05-01-2013        06-01-2013
## 49 49 OFF-SU-10003474 MX-2013-134096       05-01-2013        06-01-2013
## 50 50 OFF-LA-10002782 MX-2014-143658       03-01-2013        03-01-2013
## 51  1 OFF-LA-10002782 MX-2014-143658       01-01-2013        02-01-2013
## 52  2 FUR-FU-10004015 MX-2012-155047       01-01-2013        02-01-2013
## 53  3 FUR-BO-10002352 MX-2012-155047       01-01-2013        02-01-2013
## 54  4 OFF-BI-10004428 MX-2012-155047       01-01-2013        02-01-2013
## 55  5 OFF-AR-10004594 MX-2012-155047       01-01-2013        02-01-2013
## 56  6 OFF-EN-10001375 MX-2012-155047       01-01-2013        02-01-2013
## 57  7 OFF-EN-10001375 MX-2013-134096       01-01-2013        02-01-2013
## 58  8 TEC-MA-10004956 MX-2013-134096       01-01-2013        02-01-2013
## 59  9 OFF-SU-10003474 MX-2013-134096       01-01-2013        02-01-2013
## 60 10 TEC-AC-10001830 MX-2013-134096       01-01-2013        02-01-2013
## 61 11 OFF-BI-10002075 MX-2013-134096       01-01-2013        02-01-2013
## 62 12 OFF-FA-10002526 MX-2013-156335       01-01-2013        02-01-2013
## 63 13 FUR-CH-10002846 MX-2013-156335       01-01-2013        02-01-2013
## 64 14 OFF-EN-10004100 MX-2014-121923       02-01-2013        04-01-2013
## 65 15 OFF-AR-10003914 MX-2014-135706       02-01-2013        03-01-2013
## 66 16 OFF-FA-10000038 MX-2014-135706       02-01-2013        03-01-2013
## 67 17 OFF-EN-10000761 US-2013-126655       02-01-2013        03-01-2013
## 68 18 FUR-FU-10003066 US-2013-126655       02-01-2013        03-01-2013
## 69 19 OFF-EN-10000075 US-2013-126655       02-01-2013        03-01-2013
## 70 20 OFF-EN-10002226 US-2013-126655       02-01-2013        03-01-2013
## 71 21 FUR-CH-10002132 MX-2013-167759       02-01-2013        04-01-2013
## 72 22 TEC-AC-10002749 MX-2013-163139       02-01-2013        02-01-2013
## 73 23 OFF-SU-10000066 MX-2013-163139       02-01-2013        02-01-2013
## 74 24 OFF-BI-10003934 US-2014-119753       02-01-2013        03-01-2013
```

```
## 75 25 OFF-BI-10003932 US-2012-133970          02-01-2013          03-01-2013
##     Cost.Price Quantity Sales.Price Shipping.Index Shipping.Type
## 1      341.520        2     683.040             10      STANDARD
## 2      252.160        8    2017.280              2      PRIORITY
## 3      193.280        2     386.560              3      PRIORITY
## 4       35.440        4     141.760              4      PRIORITY
## 5       71.600        2     143.200              5      PRIORITY
## 6       56.120        2     112.240              6      PRIORITY
## 7       56.120        2     112.240              7      STANDARD
## 8      132.640        4     530.560             15      STANDARD
## 9       12.940        1      12.940             16      STANDARD
## 10      18.840        2      37.280             17      STANDARD
## 11     308.280        7    2157.560             18      STANDARD
## 12      40.176        2      79.952             19      STANDARD
## 13       8.784        3      25.952             20      PRIORITY
## 14     273.472        4    1093.688             21      PRIORITY
## 15      56.120        2     112.240              7      STANDARD
## 16     344.640        3    1033.920              8      STANDARD
## 17      97.360        4     389.440              9      STANDARD
## 18     341.520        2     683.040             10      STANDARD
## 19      12.060        3      36.180             11      STANDARD
## 20      20.760        3      62.280             12      STANDARD
## 21      56.120        2     112.240              7      STANDARD
## 22     344.640        3    1033.920              8      STANDARD
## 23      97.360        4     389.440              9      STANDARD
## 24     341.520        2     683.040             10      STANDARD
## 25      12.060        3      36.180             11      STANDARD
## 26      56.120        2     112.240              7      STANDARD
## 27     344.640        3    1033.920              8      STANDARD
## 28      97.360        4     389.440              9      STANDARD
## 29     341.520        2     683.040             10      STANDARD
## 30      12.060        3      36.180             11      STANDARD
## 31      18.840        2      37.280             17      STANDARD
## 32     308.280        7    2157.560             18      STANDARD
## 33      40.176        2      79.952             19      STANDARD
## 34       8.784        3      25.952             20      PRIORITY
## 35     273.472        4    1093.688             21      PRIORITY
## 36      56.120        2     112.240              7      STANDARD
## 37     344.640        3    1033.920              8      STANDARD
## 38      97.360        4     389.440              9      STANDARD
## 39     341.520        2     683.040             10      STANDARD
## 40      12.060        3      36.180             11      STANDARD
## 41      20.760        3      62.280             12      STANDARD
## 42      56.120        2     112.240              7      STANDARD
## 43     344.640        3    1033.920              8      STANDARD
## 44      97.360        4     389.440              9      STANDARD
## 45     341.520        2     683.040             10      STANDARD
## 46      12.060        3      36.180             11      STANDARD
## 47      56.120        2     112.240              7      STANDARD
## 48     344.640        3    1033.920              8      STANDARD
## 49      97.360        4     389.440              9      STANDARD
## 50      13.080        3      39.240              1      PRIORITY
## 51      13.080        3      39.240              1      PRIORITY
## 52     252.160        8    2017.280              2      PRIORITY
```

```
## 53     193.280     2      386.560        3      PRIORITY
## 54      35.440     4      141.760        4      PRIORITY
## 55      71.600     2      143.200        5      PRIORITY
## 56      56.120     2      112.240        6      PRIORITY
## 57      56.120     2      112.240        7      STANDARD
## 58     344.640     3     1033.920        8      STANDARD
## 59      97.360     4      389.440        9      STANDARD
## 60     341.520     2      683.040       10      STANDARD
## 61      12.060     3       36.180       11      STANDARD
## 62      20.760     3       62.280       12      STANDARD
## 63     210.640     4      842.560       13      STANDARD
## 64      80.100     3      240.300       14      STANDARD
## 65     132.640     4      530.560       15      STANDARD
## 66      12.940     1       12.940       16      STANDARD
## 67      18.840     2       37.280       17      STANDARD
## 68     308.280     7     2157.560       18      STANDARD
## 69      40.176     2       79.952       19      STANDARD
## 70       8.784     3       25.952       20      PRIORITY
## 71     273.472     4     1093.688       21      PRIORITY
## 72      27.000     1       27.000       22      PRIORITY
## 73     207.000     9     1863.000       23      PRIORITY
## 74      60.660     3      181.580       24      PRIORITY
## 75     181.116     9     1629.644       25      PRIORITY
##                Category
## 1           Technology
## 2            Furniture
## 3            Furniture
## 4     Office Supplies
## 5     Office Supplies
## 6     Office Supplies
## 7     Office Supplies
## 8     Office Supplies
## 9     Office Supplies
## 10    Office Supplies
## 11           Furniture
## 12    Office Supplies
## 13    Office Supplies
## 14           Furniture
## 15    Office Supplies
## 16          Technology
## 17    Office Supplies
## 18          Technology
## 19    Office Supplies
## 20    Office Supplies
## 21    Office Supplies
## 22          Technology
## 23    Office Supplies
## 24          Technology
## 25    Office Supplies
## 26    Office Supplies
## 27          Technology
## 28    Office Supplies
## 29          Technology
## 30    Office Supplies
```

```
## 31 Office Supplies
## 32        Furniture
## 33 Office Supplies
## 34 Office Supplies
## 35        Furniture
## 36 Office Supplies
## 37       Technology
## 38 Office Supplies
## 39       Technology
## 40 Office Supplies
## 41 Office Supplies
## 42 Office Supplies
## 43       Technology
## 44 Office Supplies
## 45       Technology
## 46 Office Supplies
## 47 Office Supplies
## 48       Technology
## 49 Office Supplies
## 50 Office Supplies
## 51 Office Supplies
## 52        Furniture
## 53        Furniture
## 54 Office Supplies
## 55 Office Supplies
## 56 Office Supplies
## 57 Office Supplies
## 58       Technology
## 59 Office Supplies
## 60       Technology
## 61 Office Supplies
## 62 Office Supplies
## 63        Furniture
## 64 Office Supplies
## 65 Office Supplies
## 66 Office Supplies
## 67 Office Supplies
## 68        Furniture
## 69 Office Supplies
## 70 Office Supplies
## 71        Furniture
## 72       Technology
## 73 Office Supplies
## 74 Office Supplies
## 75 Office Supplies
```

describeBy() with Grouping variables

```
# Code Section -19

library("psych", lib.loc="~/R/x86_64-pc-linux-gnu-library/3.3")
library(psych)
```

```r
#?describeBy() # Seek HELP for the function - Uncomment this line.

describeBy(df_3_C,df_3_C$Date.of.Invoice)
```

```
##
##  Descriptive statistics by group
## group: 01-01-2013
##     vars  n   mean     sd median trimmed    mad   min     max   range  skew
## 1      1 26   7.00   3.82   7.00    7.00   4.45  1.00   13.00   12.00  0.00
## 2      2 26  12.85   7.49  14.00   12.91  10.38  1.00   24.00   23.00 -0.06
## 3      3 26   2.23   1.84   2.00    1.82   1.48  1.00    8.00    7.00  2.27
## 4      4 26   1.00   0.00   1.00    1.00   0.00  1.00    1.00    0.00   NaN
## 5      5 26   1.00   0.00   1.00    1.00   0.00  1.00    1.00    0.00   NaN
## 6      6 26 131.14 120.02  71.60  122.55  86.76 12.06  344.64  332.58  0.66
## 7      7 26   3.23   1.61   3.00    2.91   1.48  2.00    8.00    6.00  1.86
## 8      8 26 461.53 559.95 143.20  358.77 158.67 36.18 2017.28 1981.10  1.60
## 9      9 26   7.00   3.82   7.00    7.00   4.45  1.00   13.00   12.00  0.00
## 10    10 26   1.54   0.51   2.00    1.55   0.00  1.00    2.00    1.00 -0.15
## 11    11 26   1.92   0.63   2.00    1.91   0.00  1.00    3.00    2.00  0.04
## 12    12 26  19.50  13.31  19.50   19.50  18.53  1.00   38.00   37.00  0.00
## 13    13 26  10.00   5.11  10.50   10.05   5.93  1.00   18.00   17.00 -0.05
## 14    14 26   3.65   2.50   2.00    3.59   1.48  1.00    7.00    6.00  0.41
## 15    15 26   1.58   0.58   2.00    1.55   0.74  1.00    3.00    2.00  0.31
## 16    16 26   2.27   0.87   2.00    2.27   1.48  1.00    4.00    3.00 -0.17
## 17    17 26 135.66 129.31  63.86  128.20  76.15  8.78  344.64  335.86  0.61
## 18    18 26   3.15   1.76   2.50    2.91   0.74  1.00    8.00    7.00  1.43
## 19    19 26 524.05 673.79 142.48  421.43 182.41 12.94 2157.56 2144.62  1.41
## 20    20 26  11.77   6.06  10.00   11.82   8.15  2.00   21.00   19.00  0.08
## 21    21 26   1.69   0.47   2.00    1.73   0.00  1.00    2.00    1.00 -0.79
## 22    22 26   1.96   0.60   2.00    1.95   0.00  1.00    3.00    2.00  0.01
##    kurtosis     se
## 1     -1.35   0.75
## 2     -1.45   1.47
## 3      4.52   0.36
## 4       NaN   0.00
## 5       NaN   0.00
## 6     -1.14  23.54
## 7      3.10   0.32
## 8      1.80 109.82
## 9     -1.35   0.75
## 10    -2.05   0.10
## 11    -0.59   0.12
## 12    -1.79   2.61
## 13    -1.12   1.00
## 14    -1.68   0.49
## 15    -0.98   0.11
## 16    -1.18   0.17
## 17    -1.41  25.36
## 18     1.15   0.35
## 19     0.74 132.14
## 20    -1.55   1.19
## 21    -1.43   0.09
## 22    -0.33   0.12
```

```
## -----------------------------------------------------------
## group: 02-01-2013
##    vars  n   mean     sd median trimmed    mad   min     max   range  skew
## 1     1 24  19.50   3.53  19.50   19.50   4.45 14.00   25.00   11.00  0.00
## 2     2 24  12.25   6.24  12.50   12.20   5.93  2.00   23.00   21.00 -0.01
## 3     3 24   7.75   2.51   8.00    7.80   2.97  4.00   11.00    7.00 -0.27
## 4     4 24   2.00   0.00   2.00    2.00   0.00  2.00    2.00    0.00   NaN
## 5     5 24   2.00   0.59   2.00    2.00   0.00  1.00    3.00    2.00  0.00
## 6     6 24 112.58 103.84  70.38  103.39  88.24  8.78  308.28  299.50  0.65
## 7     7 24   4.00   2.77   3.00    3.80   1.48  1.00    9.00    8.00  0.80
## 8     8 24 656.62 790.46 210.94  570.90 283.91 12.94 2157.56 2144.62  0.80
## 9     9 24  19.50   3.53  19.50   19.50   4.45 14.00   25.00   11.00  0.00
## 10   10 24   1.50   0.51   1.50    1.50   0.74  1.00    2.00    1.00  0.00
## 11   11 24   1.92   0.50   2.00    1.90   0.00  1.00    3.00    2.00 -0.17
## 12   12 24  32.00  13.25  32.00   32.00  18.53 14.00   50.00   36.00  0.00
## 13   13 24  13.38   4.59  15.50   13.80   3.71  2.00   18.00   16.00 -0.82
## 14   14 24   2.33   0.92   2.00    2.10   0.00  2.00    6.00    4.00  2.91
## 15   15 24   1.92   0.78   2.00    1.90   1.48  1.00    3.00    2.00  0.13
## 16   16 24   2.83   0.92   3.00    2.90   1.48  1.00    4.00    3.00 -0.34
## 17   17 24 155.62 145.56  97.36  151.07 126.47 12.06  344.64  332.58  0.41
## 18   18 24   2.88   0.74   3.00    2.85   1.48  2.00    4.00    2.00  0.18
## 19   19 24 428.20 396.14 389.44  403.84 460.17 36.18 1093.69 1057.51  0.49
## 20   20 24   9.42   3.37   9.00    9.25   2.22  1.00   21.00   20.00  1.02
## 21   21 24   1.92   0.28   2.00    2.00   0.00  1.00    2.00    1.00 -2.83
## 22   22 24   2.29   0.55   2.00    2.30   0.00  1.00    3.00    2.00  0.08
##    kurtosis     se
## 1     -1.36   0.72
## 2     -1.08   1.27
## 3     -1.57   0.51
## 4       NaN   0.00
## 5     -0.24   0.12
## 6     -1.12  21.20
## 7     -0.83   0.56
## 8     -1.09 161.35
## 9     -1.36   0.72
## 10    -2.08   0.10
## 11     0.61   0.10
## 12    -1.84   2.70
## 13    -0.53   0.94
## 14     8.15   0.19
## 15    -1.40   0.16
## 16    -0.84   0.19
## 17    -1.77  29.71
## 18    -1.24   0.15
## 19    -1.40  80.86
## 20     4.49   0.69
## 21     6.27   0.06
## 22    -0.77   0.11
```

```
# In this case - Grouping Variable is - Date of Invoice .
# This Grouping variable has two Values here - 01-01-2013 and 02-01-2013

# IMPORTANT NOTE --- The DOLLAR SIGN in df_3_C$Date.of.Invoice , is used
# to access a certain variable within the DATA FRAME.
```

```
# Also note that the variables within the DATA FRAME will not be stored with the Labels
# as - is
```

Built in DATA Sets

The default R environment - comes bundled with a number of packages and data sets.

A package called DATASETS - contains a number of inbuilt data sets as seen in sections below -

```
# Code Section -20


library(help = "datasets")



#
# Seen below are the DataSets available within my installed version of R -
# yours may slightly differ :-
#
# AirPassengers          Monthly Airline Passenger Numbers 1949-1960
# BJsales                Sales Data with Leading Indicator
# BOD                    Biochemical Oxygen Demand
# CO2                    Carbon Dioxide Uptake in Grass Plants
# ChickWeight            Weight versus age of chicks on different diets
# DNase                  Elisa assay of DNase
# EuStockMarkets         Daily Closing Prices of Major European Stock
#                        Indices, 1991-1998
# Formaldehyde           Determination of Formaldehyde
# HairEyeColor           Hair and Eye Color of Statistics Students
# Harman23.cor           Harman Example 2.3
# Harman74.cor           Harman Example 7.4
# Indometh               Pharmacokinetics of Indomethacin
# InsectSprays           Effectiveness of Insect Sprays
# JohnsonJohnson         Quarterly Earnings per Johnson & Johnson Share
# LakeHuron              Level of Lake Huron 1875-1972
# LifeCycleSavings       Intercountry Life-Cycle Savings Data
# Loblolly               Growth of Loblolly pine trees
# Nile                   Flow of the River Nile
# Orange                 Growth of Orange Trees
# OrchardSprays          Potency of Orchard Sprays
# PlantGrowth            Results from an Experiment on Plant Growth
# Puromycin              Reaction Velocity of an Enzymatic Reaction
# Theoph                 Pharmacokinetics of Theophylline
# Titanic                Survival of passengers on the Titanic
# ToothGrowth            The Effect of Vitamin C on Tooth Growth in
#                        Guinea Pigs
# UCBAdmissions          Student Admissions at UC Berkeley
# UKDriverDeaths         Road Casualties in Great Britain 1969-84
# UKLungDeaths           Monthly Deaths from Lung Diseases in the UK
# UKgas                  UK Quarterly Gas Consumption
# USAccDeaths            Accidental Deaths in the US 1973-1978
# USArrests              Violent Crime Rates by US State
# USJudgeRatings         Lawyers' Ratings of State Judges in the US
```

```
#                         Superior Court
# USPersonalExpenditure   Personal Expenditure Data
# VADeaths                Death Rates in Virginia (1940)
# WWWusage                Internet Usage per Minute
# WorldPhones             The World's Telephones
# ability.cov             Ability and Intelligence Tests
# airmiles                Passenger Miles on Commercial US Airlines,
#                         1937-1960
# airquality              New York Air Quality Measurements
# anscombe                Anscombe's Quartet of 'Identical' Simple Linear
#                         Regressions
# attenu                  The Joyner-Boore Attenuation Data
# attitude                The Chatterjee-Price Attitude Data
# austres                 Quarterly Time Series of the Number of
#                         Australian Residents
# beavers                 Body Temperature Series of Two Beavers
# cars                    Speed and Stopping Distances of Cars
# chickwts                Chicken Weights by Feed Type
# co2                     Mauna Loa Atmospheric CO2 Concentration
# crimtab                 Student's 3000 Criminals Data
# datasets-package        The R Datasets Package
# discoveries             Yearly Numbers of Important Discoveries
# esoph                   Smoking, Alcohol and (O)esophageal Cancer
# euro                    Conversion Rates of Euro Currencies
# eurodist                Distances Between European Cities and Between
#                         US Cities
# faithful                Old Faithful Geyser Data
# freeny                  Freeny's Revenue Data
# infert                  Infertility after Spontaneous and Induced
#                         Abortion
# iris                    Edgar Anderson's Iris Data
# islands                 Areas of the World's Major Landmasses
# lh                      Luteinizing Hormone in Blood Samples
# longley                 Longley's Economic Regression Data
# lynx                    Annual Canadian Lynx trappings 1821-1934
# morley                  Michelson Speed of Light Data
# mtcars                  Motor Trend Car Road Tests
# nhtemp                  Average Yearly Temperatures in New Haven
# nottem                  Average Monthly Temperatures at Nottingham,
#                         1920-1939
# npk                     Classical N, P, K Factorial Experiment
# occupationalStatus      Occupational Status of Fathers and their Sons
# precip                  Annual Precipitation in US Cities
# presidents              Quarterly Approval Ratings of US Presidents
# pressure                Vapor Pressure of Mercury as a Function of
#                         Temperature
# quakes                  Locations of Earthquakes off Fiji
# randu                   Random Numbers from Congruential Generator
#                         RANDU
# rivers                  Lengths of Major North American Rivers
# rock                    Measurements on Petroleum Rock Samples
# sleep                   Student's Sleep Data
# stackloss               Brownlee's Stack Loss Plant Data
```

```
# state                  US State Facts and Figures
# sunspot.month          Monthly Sunspot Data, from 1749 to "Present"
# sunspot.year           Yearly Sunspot Data, 1700-1988
# sunspots               Monthly Sunspot Numbers, 1749-1983
# swiss                  Swiss Fertility and Socioeconomic Indicators
#                        (1888) Data
# treering               Yearly Treering Data, -6000-1979
# trees                  Girth, Height and Volume for Black Cherry Trees
# uspop                  Populations Recorded by the US Census
# volcano                Topographic Information on Auckland's Maunga
#                        Whau Volcano
# warpbreaks             The Number of Breaks in Yarn during Weaving
# women                  Average Heights and Weights for American Women
#
```

ATTACH and DETACH Datasets

To OPERATE upon an inbuilt DATASET we need to LOAD it into R .

In lay-man terms , we may equate this to our earlier - read.csv() , but

there are subtle differences.

The ATTACH will pull in a Data Set from the DataSet Package into our R Search Path.

```
# Code Section -21

?attach()

# # Quoting below from inbuilt HELP -
# # The database is attached to the R search path. This means that the database is
# searched by R when evaluating a variable, so objects in the database can be accessed
# by simply giving their names.

?detach()

# # Quoting below from inbuilt HELP -
# # Detach a database, i.e., remove it from the search() path of available R objects.
# Usually this is either a data.frame which has been attached or a
# package which was attached by library.

# Another Function which will help automate is - zap()

# library(epicalc)
# ?zap()
# https://artax.karlin.mff.cuni.cz/r-help/library/epicalc/html/zap.html

# Code Section -22

search()

##  [1] ".GlobalEnv"        "package:psych"     "package:stats"
##  [4] "package:graphics"  "package:grDevices" "package:utils"
##  [7] "package:datasets"  "package:methods"   "Autoloads"
## [10] "package:base"
```

29

DATA_FRAME COLUMNS - The DF Column Vector

```
# Code Section -23

# Three basic methods to access a DF COLUMN - also called the
# DF Column Vector

print(df_1[[2]]) # Will Print 2nd COLUMN of the DF
```

```
##  [1] OFF-LA-10002782 FUR-FU-10004015 FUR-BO-10002352 OFF-BI-10004428
##  [5] OFF-AR-10004594 OFF-EN-10001375 OFF-EN-10001375 TEC-MA-10004956
##  [9] OFF-SU-10003474 TEC-AC-10001830 OFF-BI-10002075 OFF-FA-10002526
## [13] FUR-CH-10002846 OFF-EN-10004100 OFF-AR-10003914 OFF-FA-10000038
## [17] OFF-EN-10000761 FUR-FU-10003066 OFF-EN-10000075 OFF-EN-10002226
## [21] FUR-CH-10002132 TEC-AC-10002749 OFF-SU-10000066 OFF-BI-10003934
## [25] OFF-BI-10003932
## 24 Levels: FUR-BO-10002352 FUR-CH-10002132 ... TEC-MA-10004956
```

```
#
print(df_1[["Product.Name"]]) # Will Print the "NAMED"  COLUMN of the DF
```

```
##  [1] OFF-LA-10002782 FUR-FU-10004015 FUR-BO-10002352 OFF-BI-10004428
##  [5] OFF-AR-10004594 OFF-EN-10001375 OFF-EN-10001375 TEC-MA-10004956
##  [9] OFF-SU-10003474 TEC-AC-10001830 OFF-BI-10002075 OFF-FA-10002526
## [13] FUR-CH-10002846 OFF-EN-10004100 OFF-AR-10003914 OFF-FA-10000038
## [17] OFF-EN-10000761 FUR-FU-10003066 OFF-EN-10000075 OFF-EN-10002226
## [21] FUR-CH-10002132 TEC-AC-10002749 OFF-SU-10000066 OFF-BI-10003934
## [25] OFF-BI-10003932
## 24 Levels: FUR-BO-10002352 FUR-CH-10002132 ... TEC-MA-10004956
```

```
#
print(df_1$Product.Name) # Will Print the "NAMED" COLUMN of the DF
```

```
##  [1] OFF-LA-10002782 FUR-FU-10004015 FUR-BO-10002352 OFF-BI-10004428
##  [5] OFF-AR-10004594 OFF-EN-10001375 OFF-EN-10001375 TEC-MA-10004956
##  [9] OFF-SU-10003474 TEC-AC-10001830 OFF-BI-10002075 OFF-FA-10002526
## [13] FUR-CH-10002846 OFF-EN-10004100 OFF-AR-10003914 OFF-FA-10000038
## [17] OFF-EN-10000761 FUR-FU-10003066 OFF-EN-10000075 OFF-EN-10002226
## [21] FUR-CH-10002132 TEC-AC-10002749 OFF-SU-10000066 OFF-BI-10003934
## [25] OFF-BI-10003932
## 24 Levels: FUR-BO-10002352 FUR-CH-10002132 ... TEC-MA-10004956
```

DATA_FRAME - Row and Column Slices

```
# Code Section -24

# Slicing the DF COLUMNS and ROWS

print(df_1[2]) # Will Print 2nd COLUMN - ALL ROWS - of the DF as a SLICE.
```

```
##       Product.Name
## 1  OFF-LA-10002782
## 2  FUR-FU-10004015
```

```
## 3  FUR-BO-10002352
## 4  OFF-BI-10004428
## 5  OFF-AR-10004594
## 6  OFF-EN-10001375
## 7  OFF-EN-10001375
## 8  TEC-MA-10004956
## 9  OFF-SU-10003474
## 10 TEC-AC-10001830
## 11 OFF-BI-10002075
## 12 OFF-FA-10002526
## 13 FUR-CH-10002846
## 14 OFF-EN-10004100
## 15 OFF-AR-10003914
## 16 OFF-FA-10000038
## 17 OFF-EN-10000761
## 18 FUR-FU-10003066
## 19 OFF-EN-10000075
## 20 OFF-EN-10002226
## 21 FUR-CH-10002132
## 22 TEC-AC-10002749
## 23 OFF-SU-10000066
## 24 OFF-BI-10003934
## 25 OFF-BI-10003932
#
print(df_1[2,]) # Will Print 2nd ROW - ALL COLUMNS - of the DF as a SLICE.

##   X.    Product.Name        Prod.ID Date.of.Invoice Date.of.Shipping
## 2  2 FUR-FU-10004015 MX-2012-155047      01-01-2013       02-01-2013
##   Cost.Price Quantity Sales.Price Shipping.Index Shipping.Type  Category
## 2     252.16        8     2017.28              2      PRIORITY Furniture
#
print(df_1[c(2,4,6)]) # Using an INDEX VECTOR  - created with COMBINE Function.

##      Product.Name Date.of.Invoice Cost.Price
## 1  OFF-LA-10002782      01-01-2013     13.080
## 2  FUR-FU-10004015      01-01-2013    252.160
## 3  FUR-BO-10002352      01-01-2013    193.280
## 4  OFF-BI-10004428      01-01-2013     35.440
## 5  OFF-AR-10004594      01-01-2013     71.600
## 6  OFF-EN-10001375      01-01-2013     56.120
## 7  OFF-EN-10001375      01-01-2013     56.120
## 8  TEC-MA-10004956      01-01-2013    344.640
## 9  OFF-SU-10003474      01-01-2013     97.360
## 10 TEC-AC-10001830      01-01-2013    341.520
## 11 OFF-BI-10002075      01-01-2013     12.060
## 12 OFF-FA-10002526      01-01-2013     20.760
## 13 FUR-CH-10002846      01-01-2013    210.640
## 14 OFF-EN-10004100      02-01-2013     80.100
## 15 OFF-AR-10003914      02-01-2013    132.640
## 16 OFF-FA-10000038      02-01-2013     12.940
## 17 OFF-EN-10000761      02-01-2013     18.840
## 18 FUR-FU-10003066      02-01-2013    308.280
## 19 OFF-EN-10000075      02-01-2013     40.176
## 20 OFF-EN-10002226      02-01-2013      8.784
```

```
## 21 FUR-CH-10002132     02-01-2013     273.472
## 22 TEC-AC-10002749     02-01-2013      27.000
## 23 OFF-SU-10000066     02-01-2013     207.000
## 24 OFF-BI-10003934     02-01-2013      60.660
## 25 OFF-BI-10003932     02-01-2013     181.116
```

```r
# To access MULTIPLE COLUMNS - 2,4 and 6 of the DF.
```

```r
# Code Section -25
```

Plots and Graphs - the Basics

Over the next couple of sections we shall preview the basics of Plots and Graphs.

If we were to execute the code from the following sections , in the Console- the Graphs would not appear inline but would appear within the PLOTS pane of R Studio or in certain cases as POP Up's .

```r
# Code Section -26
```

```r
# Code Section -27
```

```r
# Code Section -28
```

```r
# Code Section -29
```

```r
# Code Section -30
```

```r
# Code Section -32
```

```r
# Code Section -33
```

```r
# Code Section -34
```

```r
# Code Section -35
```

```r
# Code Section -36
```

```r
sessionInfo()
```

```
## R version 3.3.2 (2016-10-31)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 16.04.1 LTS
##
## locale:
##  [1] LC_CTYPE=en_IN.UTF-8       LC_NUMERIC=C
##  [3] LC_TIME=en_IN.UTF-8        LC_COLLATE=en_IN.UTF-8
##  [5] LC_MONETARY=en_IN.UTF-8    LC_MESSAGES=en_IN.UTF-8
##  [7] LC_PAPER=en_IN.UTF-8       LC_NAME=C
##  [9] LC_ADDRESS=C               LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IN.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] psych_1.7.5
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_0.12.8    lattice_0.20-33 digest_0.6.10   rprojroot_1.1
```

```
##  [5] grid_3.3.2      nlme_3.1-124   backports_1.0.4 magrittr_1.5
##  [9] evaluate_0.10   stringi_1.1.2  rmarkdown_1.3   tools_3.3.2
## [13] foreign_0.8-66  stringr_1.1.0  yaml_2.1.14     parallel_3.3.2
## [17] mnormt_1.5-5    htmltools_0.3.5 knitr_1.15.1
```