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

```r
getwd()
```

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

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

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

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

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

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

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

Going further with VECTORS .

We combine two or more vectors to get another vector .

```r
# 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 .

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

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

```
#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"
```

```
nm_v + 2
```

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

```
#
#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
```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
#
#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
```

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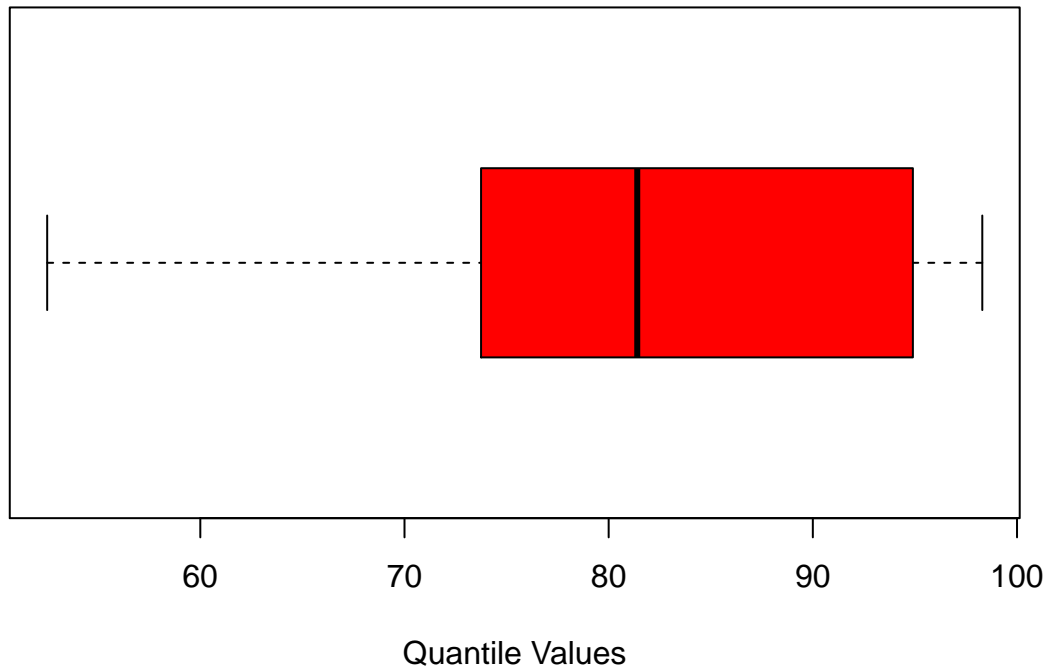
```
# Kindly note how the ARGUMENTs to boxplot()
# have been bumped to the next row - keeping in mind
# the Horizontal space of our PDF knit of the .Rmd file

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

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
```

```
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
```

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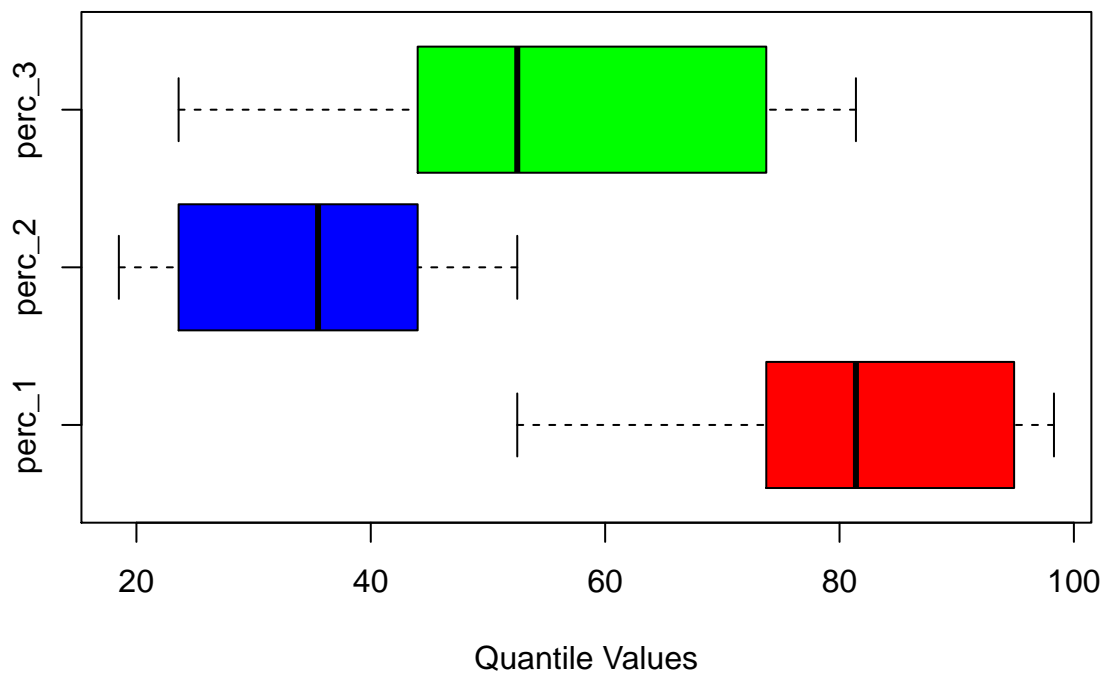
```
# Kindly note the Quantiles are randomly chosen here
# this is not the best way to choose quantiles
# we shall come back for details later in this text
```

rainbow() for Coloring Boxplots -

```
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
```

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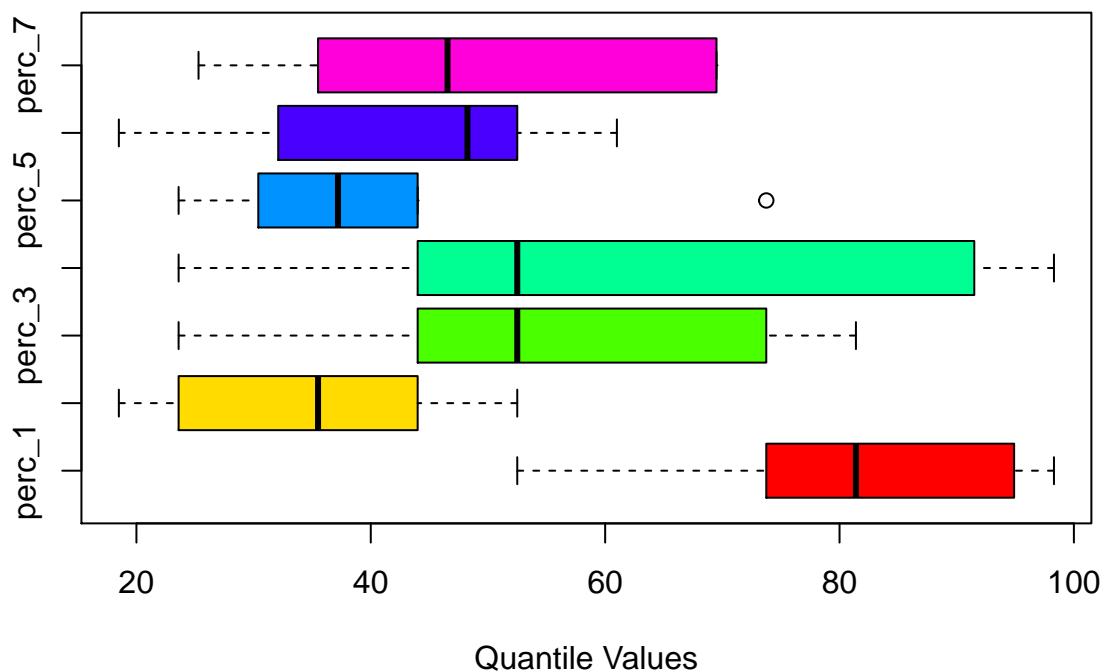
```
# Just for Fun a PIE Graph --- you always
# need to avoid PIE Graphs


pie(rep(1, 7), col = rainbow(7))
```
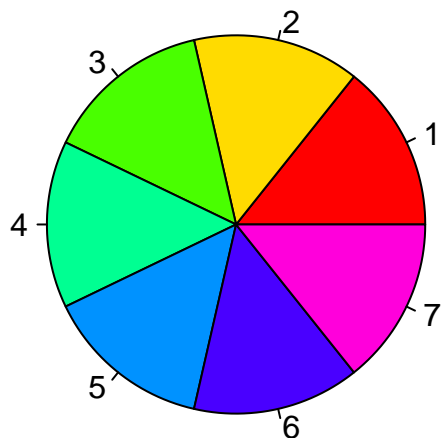
MATRICE Operations - TRANSPOSE of a MATRIX

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

```
# Code Section -10

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 -11

# 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 -

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

```
##      [,1] [,2]
## [1,]   10   13
## [2,]   11   14
## [3,]   12   15
```

```r
#
class(ma1)
```

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

```r
#
ma2 <- matrix(data=20:25,nrow=3,ncol=2)
ma2
```

```
##      [,1] [,2]
## [1,]   20   23
## [2,]   21   24
## [3,]   22   25
```

```r
#
class(ma2)
```

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

```r
# 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
```

```r
#
# 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
```

```r
# 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

```
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
#
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
```

13

```
## 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

```
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

```
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

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

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