getwd()

setwd("C:\\Users\\qwert\\Documents\\RWorkdir")

getwd()

library(MASS)

# A histogram of the distribution of prices in the Cars93 dataframe

hist(Cars93$Price)

# Extend the x-axis lower limit from 0 to 70 and use a different title.

hist(Cars93$Price, xlab="Price (x $1,000)", xlim = c(0,70),

main = "Prices of 93 Models of 1993 Cars")

# Adding graph features.

# Thinking of a histogram in terms of probabilities instead of frequencies.

hist(Cars93$Price, xlab="Price (x $1,000)", xlim = c(0,70),

main = "Prices of 93 Models of 1993 Cars",probability

= TRUE)

lines(density(Cars93$Price))

# A barplot illustrating types and frequencies of the cars.

table(Cars93$Type) # Make a table of the Frequencies.

barplot(table(Cars93$Type))

# Add features.

barplot(table(Cars93$Type),ylim=c(0,25), xlab="Type",

ylab="Frequency", axis.lty = "solid", space = .05)

# Pie graphs

pie(table(Cars93$Type))

# Dot charts.

type.frame <- data.frame(table(Cars93$Type))

type.frame

dotchart(type.frame$Freq,type.frame$Var1) # dotchart(type.frame[,2],type.frame[,1])

# Bar plots revisited # A grouped bar plot.

# When the dependent variable is a data point rather than a frequncy.

# Create a vector of values in the cells.

rev.values <-

c(1000,1300,1300,1100,1400,800,1200,1500,1850,

2330,860,1300,1400,1600,1970,570,380,450,465,580,

155,190,210,250,300)

# turn the vector into matrix.

space.rev <- matrix(rev.values,nrow=5,byrow = T)

# supply column names and row names to the matrix

colnames(space.rev) <-

c("1990","1991","1992","1993","1994")

rownames(space.rev) <- c("Commercial Satellites

Delivered","Satellite Services","Satellite Ground

Equipment","Commercial Launches","Remote Sensing Data")

# create a vector of colors for the bars.

color.names = c("black","grey25","grey50","grey75","white")

# the bar plot

barplot(space.rev, beside = T, xlab= "Year",ylab= "Revenue

(X $1,000)", col=color.names)

# Legends

legend(1,2300,rownames(space.rev), cex=0.7, fill = color.names, bty = "n")

# A scatter plot to visualize tthe relationship between horsepower and MPG.

plot(Cars93$Horsepower, Cars93$MPG.city,

xlab="Horsepower",ylab="MPG City", main ="MPG City vs

Horsepower")

# To show that MPG-city depends on horsepower. # Produces the same scatter plot.

plot(Cars93$MPG.city ~ Cars93$Horsepower,

xlab="Horsepower",ylab="MPG City", main ="MPG City vs

Horsepower")

# Manipulating the plotting character.

plot(Cars93$Horsepower,Cars93$MPG.city, xlab="Horsepower",

ylab="MPG City", main = "MPG City vs Horsepower",pch=16) # 16 corresponds filled circles.

# Userdefined pch Points are drawn as the number of cylinders in the corresponding car.

plot(Cars93$Horsepower,Cars93$MPG.city, xlab="Horsepower", ylab="MPG City", main = "MPG City vs Horsepower", pch = as.character(Cars93$Cylinders))

# Scatter plot Matrix

cars.subset <- subset(Cars93, select = c(MPG.city,Price,Horsepower))

head(cars.subset)

pairs(cars.subset)

# Scatter plot Matrix

cars.subset <- subset(Cars93, select = c(MPG.city,Price,Horsepower,Cylinders))

head(cars.subset)

pairs(cars.subset)

# Box plots.

boxplot(Cars93$Horsepower ~ Cars93$Cylinders, xlab="Cylinders",

ylab="Horsepower")

# Another means to an end without $

# boxplot(Horsepower ~ Cylinders, data = Cars93,

# xlab="Cylinders", ylab="Horsepower")

# Graduating to ggplot2

# Verify and Load the "ggplot2" Package.

# Verify the package is installed.

any(grepl("ggplot2",installed.packages()))

# Load the library into R workspace.

library("ggplot2")

# A histogram

ggplot(Cars93, aes(x=Price)) + geom\_histogram()

# Additional arguments.

ggplot(Cars93, aes(x=Price)) +

geom\_histogram(binwidth=5,color="black",fill="white") +

labs(x = "Price (x $1000)", y="Frequency", title="Prices of

93 Models of 1993 Cars")

# Bar plots # Easier using ggplot2 than base R as it's not neccessary to create a table.

ggplot(Cars93, aes(x=Type))+

geom\_bar() +

labs(y="Frequency", title="Car Type and Frequency in Cars93")

# Dot chart.

type.frame <- data.frame(table(Cars93$Type))

colnames(type.frame)<- c("Type","Frequency")

type.frame

ggplot(type.frame, aes(x=Frequency,y=Type)) +

geom\_point()

# Additional features.

ggplot(type.frame, aes(x=Frequency,y=reorder(Type,Frequency))) +

geom\_point(size = 4) +

theme\_bw() +

theme(panel.grid.major.x=element\_blank(),

panel.grid.major.y=element\_line(color = "black",linetype

= "dotted"))+

labs(y="Type")

# Bar plots revisited.

space.rev # wide format not used by ggplot2.

# Transforing the data into long format used by ggplot2.

library(reshape2)

space.melt <- melt(space.rev)

head(space.melt)

# Give meaningful names to the the columns.

colnames(space.melt) <- c("Industry","Year","Revenue")

head(space.melt)

ggplot(space.melt, aes(x=Year,y=Revenue,fill=Industry)) +

geom\_bar(stat = "identity", position = "dodge", color="black") +

scale\_fill\_grey(start = 0,end = 1)+

labs(y="Revenue (X $1,000)")+

theme\_bw()+

theme(panel.grid.major.x = element\_blank())

# Scatterplots

ggplot(Cars93,aes(x=Horsepower,y=MPG.city))+

geom\_point()

# plot twist # Manipulating plotting characters.

ggplot(Cars93, aes(x = Horsepower,y = MPG.city,label =

Cylinders)) +

geom\_text()

# Eliminating the gray backgrounds and the gridlines.

ggplot(Cars93, aes(x = Horsepower,y = MPG.city,label = Cylinders)) +

geom\_text()+

theme\_bw() +

theme(panel.grid=element\_blank())