# Chapter 2 Lab: Introduction to R

**# Basic Commands**

x <- c(1,3,2,5)

x

x = c(1,6,2)

x

y = c(1,4,3)

length(x)

length(y)

x+y

ls()

rm(x,y)

ls()

rm(list=ls())

?matrix

x=matrix(data=c(1,2,3,4), nrow=2, ncol=2)

x

x=matrix(c(1,2,3,4),2,2)

matrix(c(1,2,3,4),2,2,byrow=TRUE)

sqrt(x)

x^2

x=rnorm(50)

y=x+rnorm(50,mean=50,sd=.1)

cor(x,y)

set.seed(1303)

rnorm(50)

set.seed(3)

y=rnorm(100)

mean(y)

var(y)

sqrt(var(y))

sd(y)

**# Graphics**

x=rnorm(100)

y=rnorm(100)

plot(x,y)

plot(x,y,xlab="this is the x-axis",ylab="this is the y-axis",main="Plot of X vs Y")

pdf("Figure.pdf")

plot(x,y,col="green")

dev.off()

x=seq(1,10)

x

x=1:10

x

x=seq(-pi,pi,length=50)

y=x

f=outer(x,y,function(x,y)cos(y)/(1+x^2))

contour(x,y,f)

contour(x,y,f,nlevels=45,add=T)

fa=(f-t(f))/2

contour(x,y,fa,nlevels=15)

image(x,y,fa)

persp(x,y,fa)

persp(x,y,fa,theta=30)

persp(x,y,fa,theta=30,phi=20)

persp(x,y,fa,theta=30,phi=70)

persp(x,y,fa,theta=30,phi=40)

**# Loading Data**

[**https://www.statlearning.com/resources-first-edition**](https://www.statlearning.com/resources-first-edition)

Auto=read.table("Auto.data")

fix(Auto)

Auto=read.table("Auto.data",header=T,na.strings="?")

fix(Auto)

Auto=read.csv("Auto.csv",header=T,na.strings="?")

fix(Auto)

dim(Auto)

Auto[1:4,]

Auto=na.omit(Auto)

dim(Auto)

names(Auto)

**# Additional Graphical and Numerical Summaries**

plot(cylinders, mpg)

plot(Auto$cylinders, Auto$mpg)

attach(Auto)

plot(cylinders, mpg)

cylinders=as.factor(cylinders)

plot(cylinders, mpg)

plot(cylinders, mpg, col="red")

plot(cylinders, mpg, col="red", varwidth=T)

plot(cylinders, mpg, col="red", varwidth=T,horizontal=T)

plot(cylinders, mpg, col="red", varwidth=T, xlab="cylinders", ylab="MPG")

hist(mpg)

hist(mpg,col=2)

hist(mpg,col=2,breaks=15)

pairs(Auto)

pairs(~ mpg + displacement + horsepower + weight + acceleration, Auto)

plot(horsepower,mpg)

identify(horsepower,mpg,name)

summary(Auto)

summary(mpg)