

Handout #2

```
#
# R commands for multivariate data description and graphical calculation
#
Xmatrix <- c(1, 264, 38.5,
1, 200, 35.5,
1, 225, 36.5,
1, 268, 38,
1, 215, 36,
1, 241, 36,
1, 232, 36.5,
1, 256, 36.5,
1, 229, 35.5,
1, 288, 38.5,
1, 253, 37,
1, 288, 38,
1, 230, 37,
2, 283, 37,
2, 312, 39,
2, 291, 38,
2, 259, 37.5,
2, 216, 36,
2, 201, 36,
2, 267, 38,
2, 326, 38.5,
2, 241, 37,
2, 291, 40,
2, 269, 37.5,
2, 282, 39,
2, 257, 38.5)

X <- matrix(data = Xmatrix, ncol = 3, byrow = TRUE)

Xdata <- data.frame(Group = X[,1], LeafArea = X[,2], Height = X[,3])

# Calculate mean vector, variance-covariance matrix, and correlation matrix
#
summary(Xdata[,2:3])
cov(Xdata[,2:3])
cor(Xdata[,2:3])
#
# To use spm (ScatterPlotMatrix), must have "car" package installed
#
library(car)
#
# ?spm gives information about the spm command
#
?spm
#
# Basic Scatterplot Matrix
#
pairs(Xdata[,2:3],main=c("Plant Data"))
spm(Xdata[,2:3],diagonal=FALSE,smooth=FALSE,regLine=FALSE,main=c("Plant Data"))
#
# Add ellipses using standard method of calculation (robust=FALSE)
# Add boxplot to diagonal
#
spm(Xdata[,2:3],diagonal=list(method="boxplot"),smooth=FALSE,regLine=FALSE,ellipse=
list(levels=c(0.90), robust=FALSE, fill=FALSE),main=c("Plant Data"))
#
```

```
# R output
> summary(xdata[,2:3])
  LeafArea      Height
Min.   :200.0   Min.   :35.50
1st Qu.:230.5   1st Qu.:36.50
Median :258.0   Median :37.25
Mean   :257.1   Mean   :37.37
3rd Qu.:282.8   3rd Qu.:38.38
Max.   :326.0   Max.   :40.00
> cov(xdata[,2:3])
      LeafArea      Height
LeafArea 1090.39385 33.050769
Height    33.05077  1.451154
> cor(xdata[,2:3])
      LeafArea      Height
LeafArea 1.0000000 0.8308701
Height    0.8308701 1.0000000
```

