library(dataWorkshop)

# what is in the workspace??
ls()

## character(0)

# c combines sets of numbers (or datasets)
X <- c(2,3,20)

# now recheck workspace
ls()

## [1] "X"

# print out X
X

## [1] 2 3 20

# arithmetic
X + 5
# A colon : creates a sequence
X<- 1:10

# combining c and :
X<- c(1:5, 4:1)

# doing some arithmetic
A<- 2
B<- 10
Y<- A + B

# A<- c(2,3,4)
B<- c(10,100,1000)
Y<- A + B

# note that the numbers have been added row by row like a spread sheet.

# read in some temperature data with the (long!) filename BoulderJuneTemperature
data(BoulderJuneTemperature)

# typing the name of a data set just prints it out
BoulderJuneTemperature

## Year Temp
## 1 1984 65.52
## 2 1985 68.58
## 3 1986 69.22
## 4 1987 68.58
## 5 1988 70.92
# this data set has more than one part:

```r
names(BoulderJuneTemperature)
```

```r
## [1] "Year" "Temp"
```
# give this a simpler name to save on typing
BT <- BoulderJuneTemperature$Temp
# see how workspace has changed.
ls()

## [1] "A" "B"
## [3] "BoulderJuneTemperature" "BT"
## [5] "X" "Y"

# Boulder June Temps in Centigrade
BTcentigrade <- (BT - 32) * (5/9)
# add it to the original data set
BoulderJuneTemperature$TempC <- (BT - 32) * (5/9)

# check this
names(BoulderJuneTemperature)

## [1] "Year" "Temp" "TempC"

# using functions on data
mean(BT)

## [1] 66.94

# what is happening here
mean(1:11)

## [1] 6
\texttt{median( BT)}

## [1] 66.75

\texttt{sd( BT)}

## [1] 3.054

\texttt{# getting help}
\texttt{help( mean)}
\texttt{help( quantile)}

\texttt{# quantile( BT, na.rm=TRUE)}

## 0% 25% 50% 75% 100%
## 62.33 64.71 66.75 69.13 74.13

\texttt{quantile( BT, probs = .66, na.rm=TRUE)}

## 66%
## 68.58

\texttt{#check this should be between the 19th and 20th values}
\texttt{sort( BT)}
# getting lots of statistics on a data set

```r
summary(BoulderJuneTemperature)
```

```r
## Year Temp TempC
## Min. :1984 Min. :62.3 Min. :16.9
## 1st Qu.:1991 1st Qu.:64.7 1st Qu.:18.2
## Mean :1998 Mean :66.9 Mean :19.4
## 3rd Qu.:2006 3rd Qu.:69.1 3rd Qu.:20.6
## Max. :2013 Max. :74.1 Max. :23.4
```

```r
stats(BoulderJuneTemperature)
```

```r
## Year Temp TempC
## N 30.000 30.000 30.000
## mean 1998.500 66.941 19.412
## Std.Dev. 8.803 3.054 1.697
## min 1984.000 62.333 16.852
## Q1 1991.250 64.713 18.174
## median 1998.500 66.750 19.306
## Q3 2005.750 69.125 20.625
## max 2013.000 74.133 23.407
## missing values 0.000 0.000 0.000
```