BasicR/lessR Instructions

Download R

R is available on many Internet servers around the world, what is called CRAN, the Comprehensive R Archive Network. Obtain the latest version of R at:

```
http://cran.r-project.org
```

When preparing to download files from the CRAN servers, the web site prompts:

```
-- Please select a CRAN mirror for use in this session --
```

What follows is the list of the available CRAN servers world wide, from which you choose one, presumably close to your physical location. After you choose a server, choose an operating system from which you would like to use R. A web page appears that displays the following list of three links, one for each operating system.

- Download R for Linux
- Download R for MacOS X
- Download R for Windows

Windows: Click the Download R for Windows link near the top of the page. On the top of the resulting new page, click base. Another new page appears. Click the first link on the page, which begins with Download R followed by the current version number.

Mac: Click the Download R for Mac OS X link near the top of the page. On the resulting new page, click the first file to download, under the heading of Files:, which lists the version number followed by (latest version).

Linux: Click the Download R for Linux link and follow the posted instructions. Or, if you use a Debian version of Linux, which includes Ubuntu and Linux Mint, you can instead download R from the usual software repository available with the Debian package system.

If you are asked to establish a Personal Library for R, click Yes. Otherwise you will likely need to adjust access privileges for specific folders and files.

Download and Load lessR

lessR is available from the worldwide CRAN servers. To obtain this version, within a running R session from the command prompt, >, enter the following.

```
> install.packages("lessR")
```

This statement downloads and installs lessR along with the 5 other packages with functions upon which lessR relies in addition to the standard, base R functions.

Each time you begin an R session first load the lessR functions.

```
> library(lessR)
```

Read the Data into R

The data for the analysis must be encoded in the form of a data table. The first row consists of the variable names and each remaining row contains the data for a specific person, company or whatever is the unit of analysis. Read the data from a computer file into an R data table named mydata. The file can be a csv or tab-delimited text file, an Excel file or a SAS or SPSS file.

If you read a file for which to browse on your computer, leave an empty parentheses.

```
> mydata <- Read()
```

If you read a file with a path name or web URL, include it in quotes inside the ().

```
> mydata <- Read("http://web.pdx.edu/~gerbing/data/SalaryGender.csv")
```

Cross-Sectional Analysis

To conduct the analysis of interest invoke the corresponding data analysis function. Refer to the data values to analyze by their variable names. The variable names are listed when you read the data into `mydata`. The data table in the file SalaryGender.csv has two variables, Salary and Gender. Here obtain a histogram of a variable named Salary.

```
> Histogram(Salary)
```

Options for the `Histogram` function include `bin.start`, `bin.width` and `bin.end`.

Here obtain a *t*-test and confidence interval of the value of Salary against the null hypothesis of 60,000. The brief version of the `ttest` function provides the basic, less comprehensive output. Drop the `mu0` for just a confidence interval.

```
> tt.brief(Salary, mu0=60000)
```

If you want an unpaired, the independent-groups *t*-test of Salary by Gender that compares the means of the two groups, then

```
> tt.brief(Salary ~ Gender)
```

The tilde, ~ , means "explained by", which indicates the construction of a model in which the values of one variable, the response variable, here Salary, are explained in terms of the values of one or more other variables, here called Gender.

Options for the `ttest` function include `conf.level`, expressed as a proportion such as `conf.level=0.99`, and `Edesired`.

A paired or dependent-groups analysis is also available, which evaluates the difference of each pair of scores directly.

```
> ttest(Before, After, paired=TRUE)
```

Here the differences between the Before and After scores are evaluated.

Regression analysis can be specified in brief or full form, here for response variable Y and predictor variables X1 and X2.

```
> reg.brief(Y ~ X1 + X2)
```

```
> reg(Y ~ X1 + X2)
```

The output of the brief form is equivalent to that provided by Excel.

Analysis of Time Ordered Values

For a run chart of variable Y: `> LineChart(Y)`