

## 1.10 Exercise: Install and start using R

### Using R for *Data to Insight*

This is a late breaking initiative to make analyses in **R** available in this run of *Data to Insight*. The intended audience is people who already have had some experience with installing software and some experience of coding, or at least of using some command-driven system.

**R** is made up of a base system and many thousands of additional packages which give it enormous capability. Almost all of our analyses will use functions from Tom Elliot's **R** package **iNZightPlots** which in turn draw on many other packages.

**Warning:** Coding is entirely unforgiving. If you get anything wrong, however small (e.g. missing a bracket, misspelling a name, using a lower-case letter when the name has an upper-case letter or vice versa as *R is case sensitive*), you will just get error messages. So be very careful, and even then expect to make mistakes.

1. **Install R:** Go to <https://cran.r-project.org/mirrors.html> and click on a CRAN mirror site near you. Download and install R (download versions available for Windows, Mac and Linux).

**Warning:** *If you are a Mac user and may also want to use iNZight just use the version of R installed while installing iNZight. Installing a second version is likely to create problems for you. The iNZight installation will already have installed the packages in number 3. below.*

2. **Start up R.**
3. *[If you are using iNZight's R-Console or using the version of R installed by iNZight on Mac do not do Step 3 and skip to Step 4 because the packages referred to are already there]*  
**Install the R packages** we will be using in the course by copying the following 2 lines of code and pasting them into the **R Console** window (not in R Studio).

```
install.packages(c('iNZightPlots', 'FutureLearnData'), dependencies = TRUE,  
                repos = c('https://r.docker.stat.auckland.ac.nz', 'https://cran.rstudio.com'))
```

If it asks you, ***“Would you like to create a personal library to install packages into?”***, say, ***“Yes”***.

**[NOTE: If your copy-and-paste from the two lines in red doesn't work properly get them from [https://www.stat.auckland.ac.nz/~wild/d2i/exercises/1.10%20exercise-install-R\\_17.txt](https://www.stat.auckland.ac.nz/~wild/d2i/exercises/1.10%20exercise-install-R_17.txt).]**

4. When that has completed, **paste the following 2 lines into the R Console window**

```
library(iNZightPlots)
```

```
library(FutureLearnData)
```

You will get error messages if these packages have not installed.

5. **Now try the following:** (Paste lines of code, or even several lines of code at a time, into the **R Console** window. See what they do.

# R CODE	COMMENTARY
	<i>These first 2 lines have to be run every time you start up R and want to use the functionality in <b>iNZightPlots</b>, or the data in <b>FutureLearnData</b>.</i>
<pre>library(iNZightPlots) library(FutureLearnData)</pre>	<i>Load the <b>iNZightPlots</b> package Load the <b>FutureLearnData</b> package (contains all the data sets for the course)</i>
<pre>data(package="FutureLearnData")</pre>	<i>Tell me about all <b>the data sets</b> in <b>FutureLearnData</b></i>
<pre>data(nhanes_1000)</pre>	<i>Make the data set <b>nhanes_1000</b> in <b>FutureLearnData</b> available for analysis</i>
<pre>nhanes_1000[1:10, 1:8]</pre>	<i>Show me the <b>first 10 rows</b> and <b>8 columns</b> of <b>nhanes_1000</b></i>
<pre>head(nhanes_1000) tail(nhanes_1000)</pre>	<i>Show me the <b>top rows</b> of <b>nhanes_1000</b> Show me the <b>bottom rows</b> of <b>nhanes_1000</b></i>
<pre>names(nhanes_1000)</pre>	<i>Give me the <b>names</b> of all of the variables in <b>nhanes_1000</b></i>
<pre>iNZightPlot(Race3, data=nhanes_1000)</pre>	<i>Plot the variable named <b>Race3</b> in <b>nhanes_1000</b></i>
<pre>iNZightPlot(Height, data=nhanes_1000) getPlotSummary(Height, data=nhanes_1000)</pre>	<i>Plot the variable named <b>Height</b> in <b>nhanes_1000</b> Get me a <b>Summary</b> of the variable named <b>Height</b> in <b>nhanes_1000</b></i>

4. **Ask** for plots and summaries of other variables whose names you can see in the names list.

5. **When you have finished, close R.** When it asks **“Save Workspace image?”**, click, **“No”**.

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**To discuss issues related to this Exercise,**

go to <https://gitter.im/iNZightVIT/d2i-R-discussion>

*To be able to post to the list you will have to set up a (free) account on **Github***

<https://github.com/login>

***If your question relates to an Exercise, say which one you are talking about!***