1.6 Editors

As explained above, the process of running R code requires the user to type the code and click enter. Typing the code into a special text editor for copying and pasting into R is strongly recommended. This allows the user to easily save code, document it, and rerun it at a later stage. The question is which text editor to use. Our experience is with Windows operating systems, and we are unable to recommend editors for Mac, UNIX, or LINUX. A detailed description of a large number of editors is given at http://www.sciviews.org/_rgui/projects/Editors.html. This page contains some information on Mac, UNIX, and LINUX editors.

For Windows operating systems, we strongly advise against using Microsoft Word. Word automatically wraps text over multiple lines and adds capitals to words at the beginning of the line. Both will cause error messages in R. R's own text editor (click **File-> New script** as shown in Fig. 1.5) and Notepad are alternatives, although neither have the bells and whistles available in R-specific text editors such as Tinn-R (http://www.sciviews.org/Tinn-R/) and RWindEdt (this is an R package).

R is case sensitive, and programming requires the use of curly brackets {}, round brackets (), and square brackets []. It is important that an opening bracket

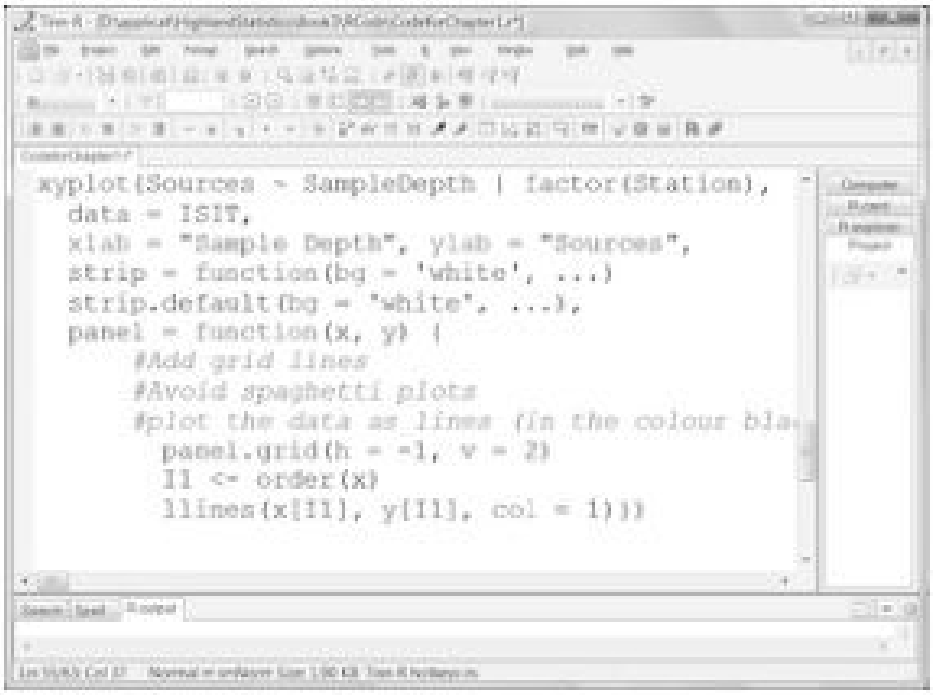

Fig. 1.9 The Tinn-R text editor. Each bracket style has a distinctive colour. Under **Options-> Main-> Editor**, the font size can be increased. Under **Options-> Main-> Application-> R**, you can specify the path for R. Select the **Rgui.exe** file in the directory **C:\Program Files\R\R-2.7.1\bin** (assuming default installation settings). Adjust the R directory if you use a different R version. This option allows sending blocks of code directly to R by highlighting code and clicking one of the icons above the file name

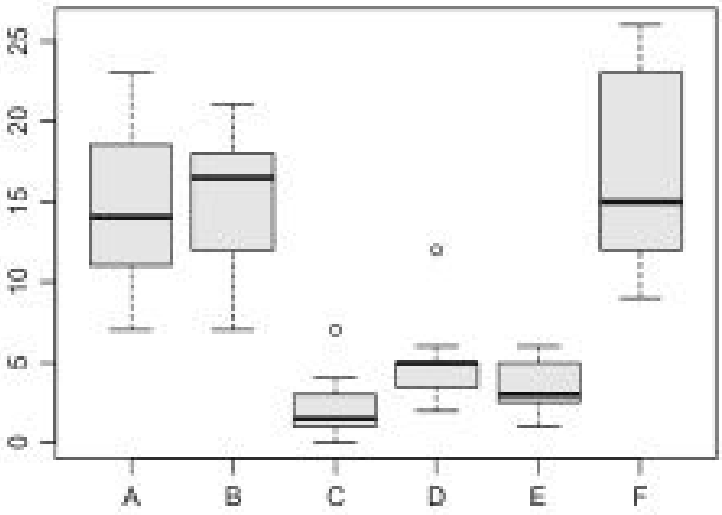

Fig. 1.10 Boxplot obtained by copying and pasting code from the boxplot help file into R. To see the data on which the graph is based, type: `?InsectSprays`

It is important to copy entire pieces of code and not a segment that contains only part of the code. With long pieces of code, it can be difficult to identify beginning and end points, and sometimes guesswork is needed to determine where a particular command ends. For example, if you only copy and paste the text

```
> boxplot(count ~ spray, data = InsectSprays,
```

you will see a "+" symbol (Fig. 1.11), indicating that R expects more code. Either paste in the remainder of the code, or press *escape* to cancel the action and proceed to copy and paste in the entire command.

Nearly all help files have a structure similar to the help file of the *boxplot* function.

Fig. 1.11 R is waiting for more code, as an incomplete command has been typed. Either add the remaining code or press "escape" to abort the boxplot command

Ripley, 2008), and vegan (Oksanen et al., 2008). The reference for R itself is: R Development Core Team (2008). Note that some references may differ depending on the version of R used.

1.13 Which R Functions Did We Learn?

We conclude each chapter with a section in which we repeat the R functions that were introduced in the chapter. In this chapter, we only learned a few commands. We do not repeat the functions for the bioluminescent lattice plot and the penguin plot here, as these were used only for illustration. The functions discussed in this chapter are given in Table 1.1.

Table 1.1 R functions introduced in Chapter 1

Function	Purpose	Example
`?`	Access help files	`?boxplot`
`#`	Add comments	`#Add your comments here`
`boxplot`	Makes a boxplot	`boxplot (y)boxplot (y~factor (x))`
`log`	Natural logarithm	`log (2)`
`log10`	Logarithm with base 10	`log10 (2)`
`library`	Loads a package	`library (MASS)`
`setwd`	Sets the working directory	`setwd ("C:/AnyDirectory/")`
`q`	Closes R	`q()`
`citation`	Provides citation for R	`citation()`

Chapter 2
Getting Data into R

In the following chapter we address entering data into R and organising it as scalars (single values), vectors, matrices, data frames, or lists. We also demonstrate importing data from Excel, ascii files, databases, and other statistical programs.

2.1 First Steps in R

2.1.1 Typing in Small Datasets

We begin by working with an amount of data that is small enough to type into R. We use a dataset (unpublished data, Chris Elphick, University of Connecticut) containing seven body measurements taken from approximately 1100 saltmarsh sharp-tailed sparrows (*Ammodramus caudacutus*) (e.g., size of the head and wings, tarsus length, weight, etc.). For our purposes we use only four morphometric variables of eight birds (Table 2.1).

Table 2.1 Morphometric measurements of eight birds. The symbol `NA` stands for a missing value. The measured variables are the lengths of the wing (measured as the wing chord), leg (a standard measure of the tarsus), head (from the bill tip to the back of the skull), and weight.

Wingcrd	Tarsus	Head	Wt
59	22.3	31.2	9.5
55	19.7	30.4	13.8
53.5	20.8	30.6	14.8
55	20.3	30.3	15.2
52.5	20.8	30.3	15.5
57.5	21.5	30.8	15.6
53	20.6	32.5	15.6
55	21.5	NA	15.7

The simplest, albeit laborious, method of entering the data into R is to type it in as scalars (variables containing a single value). For the first five observations of wing length, we could type:

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