Chapter 1

Installation

To use Zelig, you must install the statistical program R (if it is not already installed), the Zelig package, and some R libraries (coda, MCMCpack, sandwich, VGAM, and zoo).

Note: In this document, `>` denotes the R prompt.

If You Know R

We recommend that you launch R and type

```
> source("http://gking.harvard.edu/zelig/install.R")
> library(Zelig)
```

then proceed to Section **??**. For Windows R, you may edit the `Rprofile` file to load Zelig automatically at launch (after which you will no longer need to type `library(Zelig)` at startup). Simply add the line:

```
options(defaultPackages = c(getOption("defaultPackages"), "Zelig"))
```

If You Are New to R

If you are new to R, we recommend that you read the following section on installation procedures as well as the overview of R syntax and usage in Section **??**.

This distribution works on a variety of platforms, including Windows (see Section **??**), MacOSX (see Section **??**), and Linux (see Section **??**). Alternatively, you may access R from your PC using a terminal window or an X-windows tunnel to a Linux or Unix server (see Section **??**). Most servers have R installed; if not, contact your network administrator.

There are advantages and disadvantages to each type of installation. On a personal computer, R is easier to install and launch. Using R remotely on a server requires a bit more set-up, but does not tie up your local CPU, and allows you to take advantage of the server's speed.

1.1 Windows

Installing R

Go to the Comprehensive R Archive Network website (`http://www.r-project.org`) and download the latest installer for Windows at `http://cran.us.r-project.org/bin/windows/base/` Double-click the `.exe` file to launch the R installer. We recommend that you accept the default installation options if this your first installation.

Installing Zelig

Once R is installed, you must install the Zelig and VGAM packages. There are three ways to do this.

1. We recommend that you start R and then type:

   ```
   > source("http://gking.harvard.edu/zelig/install.R")
   > library(Zelig)
   ```

2. Alternatively, you may install each component package individually in R:

   ```
   > install.packages("Zelig")
   > install.packages("zoo")
   > install.packages("sandwich")
   > install.packages("MCMCpack")
   > install.packages("coda")
   > install.packages("lattice")
   > install.packages("mvtnorm")
   > install.packages("VGAM")
   > install.packages("sna")
   > install.packages("systemfit")
   > install.packages("nnet")
   > install.packages("gee")
   > install.packages("mgcv")
   > library(Zelig)
   ```

   Zelig will load the optional libraries whenever their functions are needed; it is not necessary to load any package other than Zelig at startup.

3. Alternatively, you may use the drop down menus to install Zelig. This requires four steps.

   (a) Go to the Zelig website and and download the latest release of Zelig. The VGAM, MCMCpack, coda, zoo, and sandwich packages are available from CRAN. Store

these `.zip` files in your R program directory. For example, the default R program directory is `C:\Program Files\R\R-2.5.1\`.[1]

(b) Start R. From the drop-down menus, select the "Packages" menu and then the "Install Files from Local Zip Files" option.

(c) A window will pop up, allowing you to select one of the downloaded files for installation. There is no need to unzip the files prior to installation. Repeat and select the other downloaded file for installation.

(d) At the R prompt, type `library(Zelig)` to load the functionality described in this manual. Note that Zelig will automatically load the other libraries as necessary.

4. An additional *recommended but optional step* is to set up R to load Zelig automatically at launch. (If you skip this step, you must type `library(Zelig)` at the beginning of every R session.) To automate this process, edit the `Rprofile` file located in the R program subdirectory (`C:\Program Files\R\R-2.5.1\etc\` in our example). Using a text editor such as Windows notepad, add the following line to the `Rprofile` file:

```
options(defaultPackages = c(getOption("defaultPackages"), "Zelig"))
```

Zelig is distributed under the GNU General Public License, Version 2. After installation, the source code is located in your R library directory, which is by default `C:\Program Files\R\R-2.5.1\library\Zelig\`.

Updating Zelig

There are two ways to update Zelig.

1. We recommend that you periodically update Zelig at the R prompt by typing:

```
> update.packages()
> library(Zelig)
```

2. Alternatively, you may use the procedure outlined in Section **??** to periodically update Zelig. Simply download the latest `.zip` file and follow the four steps.

1.2 MacOS X

Installing R

If you are using MacOS X, you may install the latest version of R (2.5.1 at this time) from the CRAN website   http://cran.us.r-project.org/bin/macosx/. At this time, Zelig is not supported for R on MacOS 8.6 through 9.x.

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[1]Note that when updating R to the latest release, the installer does not delete previous versions from your `C:\Program Files\R\` directory. In this example, the subdirectory `\R-2.5.1\` stores R version 2.5.1. Thus, if you have a different version of R installed, you should change the last part of the R program directory file path accordingly.

Installing Zelig

Once R is installed, you must install the Zelig and VGAM packages. There are several ways to do this.

1. **For RAqua**:

   (a) We recommend that you start R, and then type:

   ```
   > source("http://gking.harvard.edu/zelig/install.R")
   > library(Zelig)
   ```

   (You may ignore the warning messages, unless they say "Non-zero exit status".)

   (b) Alternatively, to avoid the warning messages, you need to install each package individually and specify the specific installation path:

   ```
   > install.packages("Zelig", lib = "~/Library/R/library")
   > install.packages("zoo", lib = "~/Library/R/library")
   > install.packages("sandwich", lib = "~/Library/R/library")
   > install.packages("MCMCpack", lib = "~/Library/R/library")
   > install.packages("coda", lib = "~/Library/R/library")
   > install.packages("lattice", lib = "~/Library/R/library")
   > install.packages("mvtnorm", lib = "~/Library/R/library")
   > install.packages("VGAM", lib = "~/Library/R/library")
   > install.packages("sna", lib = "~/Library/R/library")
   > install.packages("systemfit", lib = "~/Library/R/library")
   > install.packages("nnet", lib = "~/Library/R/library")
   > install.packages("gee", lib = "~/Library/R/library")
   > install.packages("mgcv", lib = "~/Library/R/library")
   > library(Zelig)
   ```

   where `~/Library/R/library` is the default local library directory. Zelig will load the other libraries whenever their functions are needed; it is not necessary to load these packages at startup.

   (c) Alternatively, you may use the drop down menus to install Zelig. This requires three steps.

      i. Go to the Zelig website and download the latest release of Zelig. The VGAM, MCMCpack, coda, zoo, and sandwich packages are available from CRAN. Save these `.tar.gz` files in a convenient place.

      ii. Start R. From the drop-down menus, select the "Packages" menu and then the "Install Files from Local Files" option.

      iii. A window will pop up, allowing you to select the one of the downloaded files for installation. There is no need to unzip the files prior to installation. Repeat and select the other downloaded file for installation.

2. **For command line R:**

   (a) Before installing command line R, you need to create a local R library directory. If you have done so already, you may skip to the next step. Otherwise, at the terminal prompt in your home directory, type:

   ```
   % mkdir ~/Library/R ~/Library/R/library
   ```

   (b) Modify your configuration file to identify `~/Library/R/library` as your R library directory. There are two ways of doing this:

       i. Open the `.Renviron` file (or create one, if you don't have one) and add the following line:

       ```
       R_LIBS = "~/Library/R/library"
       ```

       ii. *Alternatively*, you may modify your shell configuration file. For a Bash shell, open your `.bashrc` file and add the following line:

       ```
       export R_LIBS="$HOME/Library/R/library"
       ```

   (c) Start R and at the prompt, type:

   ```
   > source("http://gking.harvard.edu/zelig/install.R")
   > library(Zelig)
   ```

   (You may ignore the warning messages, unless they say "Non-zero exit status".)

   (d) Alternatively, to avoid the warning messages, you need to install each component package separately and specify the installation path:

   ```
   > install.packages("Zelig", lib = "~/Library/R/library")
   > install.packages("zoo", lib = "~/Library/R/library")
   > install.packages("sandwich", lib = "~/Library/R/library")
   > install.packages("MCMCpack", lib = "~/Library/R/library")
   > install.packages("coda", lib = "~/Library/R/library")
   > install.packages("lattice", lib = "~/Library/R/library")
   > install.packages("mvtnorm", lib = "~/Library/R/library")
   > install.packages("VGAM", lib = "~/Library/R/library")
   > install.packages("sna", lib = "~/Library/R/library")
   > install.packages("systemfit", lib = "~/Library/R/library")
   > install.packages("nnet", lib = "~/Library/R/library")
   > install.packages("gee", lib = "~/Library/R/library")
   > install.packages("mgcv", lib = "~/Library/R/library")
   > library(Zelig)
   ```

   Although the `lib` argument is optional, we recommend that you set it to the default RAqua directory (`"~/Library/R/library"`), in case you later decide to install the RAqua GUI (which has a different default directory).

At the R prompt, type `library(Zelig)` to load the functionality described in this manual. Note that Zelig will automatically load the other packages as necessary.

Zelig is distributed under the GNU General Public License, Version 2. After installation, the source code is located in your R library directory, `~/Library/R/library/Zelig/`.

Updating Zelig

There are two ways to update Zelig.

1. We recommend that you start R and, at the R prompt, type:

   ```
   > update.packages()
   ```

2. Alternatively, you may remove an old version by command by typing `R CMD REMOVE Zelig` at the terminal prompt. Then download and reinstall the package using the installation procedures Section **??** outlined above.

1.3   UNIX and Linux

Installing R

Type `R` at the terminal prompt (which we denote as `%` in this section) to see if R is available. (Typing `q()` will enable you to quit.) If it is installed, proceed to the next section. If it is not installed and you are not the administrator, contact that individual, kindly request that they install R on the server, and continue to the next section. If you have administrator privileges, you may download the latest release at the CRAN website. Although installation varies according to your Linux distribution, we provide an example for Red Hat Linux 9.0 as a guide:

1. Log in as root.

2. Download the appropriate binary file for Red Hat 9 from CRAN. For example, for Red Hat 9 running on the Intel 386 platform, go to `http://cran.r-project.org/bin/linux/`.

3. Type the following command at the terminal prompt:
   `% rpm -ivh R-2.5.1-1.i386.rpm`

Installing Zelig

Before installing Zelig, you need to create a local R library directory. If you have done so already, you can skip to Section **??**. If not, you must do so before proceeding because most users do not have authorization to install programs globally. Suppose we want the directory to be `~/.R/library`. At the terminal prompt in your home directory, type:

```
% mkdir ~/.R ~/.R/library
```

Now you are ready to install Zelig. There are two ways to proceed.

1. Recommended procedure:

   (a) Open the `~/.Renviron` file (or create it if it does not exist) and add the following line:

   ```
   R_LIBS = "~/.R/library"
   ```

   You only need to perform this step once.

   (b) Start R. At the R prompt, type:

   ```
   > source("http://gking.harvard.edu/zelig/install.R")
   > library(Zelig)
   ```

   (You may ignore the warning messages, unless they say "Non-zero exit status".)

   (c) Alternatively, you can avoid the warning messages by installing each component package separately and specifying the installation path:

   ```
   > install.packages("Zelig", lib = "~/Library/R/library")
   > install.packages("zoo", lib = "~/Library/R/library")
   > install.packages("sandwich", lib = "~/Library/R/library")
   > install.packages("MCMCpack", lib = "~/Library/R/library")
   > install.packages("coda", lib = "~/Library/R/library")
   > install.packages("lattice", lib = "~/Library/R/library")
   > install.packages("mvtnorm", lib = "~/Library/R/library")
   > install.packages("VGAM", lib = "~/Library/R/library")
   > install.packages("sna", lib = "~/Library/R/library")
   > install.packages("systemfit", lib = "~/Library/R/library")
   > install.packages("nnet", lib = "~/Library/R/library")
   > install.packages("gee", lib = "~/Library/R/library")
   > install.packages("mgcv", lib = "~/Library/R/library")
   > library(Zelig)
   ```

   (d) Finally, create a `.Rprofile` file in your home directory, containing the line:

   ```
   library(Zelig)
   ```

   This will load Zelig every time you start R.

2. Alternatively:

   (a) Add the local R library directory that you created above (`~/.R/library` in the example) to the environmental variable R_LIBS.

   (b) Download the latest bundles for Unix from the Zelig website, and (for the VGAM, MCMCpack, coda, sandwich, and zoo packages) from the CRAN website.

(c) If `XX` is the current version number, at the terminal prompt, type:

```
% R CMD INSTALL Zelig_XX.tar.gz
% R CMD INSTALL zoo_XX.tar.gz
% R CMD INSTALL sandwich_XX.tar.gz
% R CMD INSTALL MCMCpack_XX.tar.gz
% R CMD INSTALL coda_XX.tar.gz
% R CMD INSTALL lattice_XX.tar.gz
% R CMD INSTALL mvtnorm_XX.tar.gz
% R CMD INSTALL VGAM_XX.tar.gz
% R CMD INSTALL sna_XX.tar.gz
% R CMD INSTALL systemfit_XX.tar.gz
% R CMD INSTALL nnet_XX.tar.gz
% R CMD INSTALL gee_XX.tar.gz
% R CMD INSTALL mgcv_XX.tar.gz

% rm Zelig_XX.tar.gz zoo_XX.tar.gz sandwich_XX.tar.gz MCMCpack_XX.tar.gz coda_X
```

(d) Create a `.Rprofile` file in your home directory, containing the line:

```
library(Zelig)
```

This will load Zelig every time you start R.

Zelig is distributed under the GNU General Public License, Version 2. After installation, the source code is located in your R library directory. If you followed the example above, this is `/.R/library/Zelig/`.

Updating Zelig

There are two ways to update Zelig.

1. We recommend that you start R and, at the R prompt, type:

```
> update.packages()
```

2. Alternatively, you may remove an old version by command by typing `R CMD REMOVE Zelig` at the terminal prompt. Then download and reinstall the package using the installation procedure Section **??** outlined above.

1.4   Version Compatability

In addition to R itself, Zelig also depends on several R packages maintained by other development teams. Although we make every effort to keep the latest version of Zelig up-to-date with the latest version of those packages, there may occasionally be incompatabilities. See **??** in the Appendix for a list of packages tested to be compatabile with a given Zelig release. You may obtain older versions of most packages at `http://www.r-project.org`.

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