What is R?

"R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. R can be considered as a different implementation of S. There are some important differences, but much code written for S runs unaltered under R.

R provides a wide variety of statistical (linear and nonlinear modeling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible. The S language is often the vehicle of choice for research in statistical methodology, and R provides an Open Source route to participation in that activity.

One of R's strengths is the ease with which well-designed publication-quality plots can be produced, including mathematical symbols and formulae where needed. Great care has been taken over the defaults for the minor design choices in graphics, but the user retains full control.

R is available as Free Software under the terms of the Free Software Foundation's GNU General Public License in source code form. It compiles and runs on a wide variety of UNIX platforms and similar systems (including FreeBSD and Linux), Windows and MacOS." (from "The R Project for Statistical Computing" web page)

Downloading R

The R statistical analysis program is available for downloading from the web. The process for downloading and installing follows.
1. Use a web browser to access the CRAN (Comprehensive R Archive Network) web page: http://cran.us.r-project.org/
2. Click on "Download R for Windows".
3. Click on "base".
4. Click on "Download R 3.6.0 for Windows" to begin the download. Note that the size of this file 80 MB, so it may require a few minutes to download the file.
5. Click on "Save File".
6. In the window that opens, browse to the folder in which you want to save the file and click on "Save".
7. Uninstall any previous versions of R and close all programs before completing the next step.
8. Install the file by double clicking on it, which will initiate a standard Windows installer. Follow the installation instructions. This process will insert an entry for R into the Start Menu and create an R icon on the Desktop.
9. At this point R is installed. When R is started, a standard Help menu is available that contains documentation on R.
10. Additional documentation is on the R web page under Documentation. Under Documentation, "Contributed" has user-contributed documentation for beginners. You may find one or more of these useful.

Starting R

R may be started from the Start Menu or from the Desktop icon. An important aspect in using R is to keep different projects on which you are working separated. We recommend that a separate folder be setup for each project.

To start R for the first time in a project:
   1. Place a copy of the Desktop R icon in the project folder.
   2. Right click on the R icon in the project folder.
   3. Click on the Properties tab.
   4. In the "Start in" dialog box, type the directory path for the project
      folder, e.g., C:\Documents\Project1
   5. Start R by clicking on the R icon in the project folder. This will make R
      automatically reference that folder when accessing and creating data
      files.

After having done this the first time, simply click on the R icon to begin in
that project folder.

Installing and using R library: spsurvey

   1. Start R.
   2. Click on the "Packages" menu and select "Install package(s) ...".
   3. A list will open that displays CRAN mirrors. Select one of the sites and
      click on "OK".
   4. Select "spsurvey" and click on "OK".
   5. R will install the spsurvey package. The package is installed in a
      folder named "spsurvey" in the "library" folder of the R software folder.
      The library folder contains all installed packages. In addition, if they
      are not already installed, R will install seven additional packages that
      are required by spsurvey: crossdes, deldir, Hmisc, parallel, rgeos, sf,
      and sp. Note that some of these packages may install additional packages.
   6. Installation of the spsurvey package only needs to be done once.
   7. Each time R is started in a session, you have to separately "load" the
      spsurvey package in order to access the functions and their help
      files. To load the package, click on the "Packages" menu and select
      "Load package...". Select "spsurvey" and click on "OK". The package will
      be loaded by R.
   8. After loading the library, help for using the functions in the library is
      available through the help command, i.e., enter "help(function name)" at
      the command line, and through the "Help" menu (click on "Help", click on
      "R functions (text)...", enter the function name, and click on "OK").
      Help for the entire library also is available through the "Help" menu
      (click on "Help", click on "Html help", click on "Packages", and
      click on "spsurvey").

Text Editors and R

Using a text editor is recommended for use in conjunction with R. Placing all R
commands used in a text file will document how the analysis was completed. If
necessary, the text file can be re-executed to duplicate any result or to redo
an analysis if data has changed.

Although Notepad is available with Windows, RStudio and Tinn-R provide
enhancements for editing and executing files that contain R code. Most users
will find that RStudio is especially helpful. RStudio can be downloaded from
http://www.rstudio.org/. Tinn-R can be downloaded from
http://www.sciviews.org/Tinn-R/.