1 General Information: README

This is the README file for the distribution of ESS version 5.3.1

ESS is a GNU Emacs and XEmacs mode for interactive statistical programming and data analysis. Languages supported: the S family (S 3/4, S-PLUS 3/4/5/6/7, and R), SAS, XLispStat, Stata and BUGS. Installation help can be found in sections for both Unix and Windows. ESS grew out of the desire for bug fixes and extensions to S-mode and SAS-mode as well as a consistent union of their features in one package.

The current development team is led by Martin Maechler since August 2004. Former project leader A.J. (Tony) Rossini (rossini@blindglobe.net) did the initial port to XEmacs and has been the primary coder. Martin Maechler (maechler@stat.math.ethz.ch) and Kurt Hornik (Kurt.Hornik@R-project.org) have assisted with S-PLUS, S4, R, and XLispStat. Stephen Eglen (stephen@gnu.org) has worked mostly on R support. Richard M. Heiberger (rmh@temple.edu) has assisted with S-PLUS and S4 development for Windows. Richard and Rodney A. Sparapani (rsparapa@mcw.edu) have done much of the work implementing interactive SAS (iESS[SAS]) and batch SAS (ESS[SAS]) support.

We are grateful to the previous developers of S-mode (Doug Bates, Ed Kademan, Frank Ritter, David M. Smith), SAS-mode (Tom Cook) and Stata-mode (Thomas Lumley).

1.1 License

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1.2 Starting an ESS process

To start an S session on Unix or on Windows when you use the Cygwin bash shell, simply type `M-x S RET`.

To start an S session on Windows when you use the MSDOS prompt shell, simply type `M-x S+6-msdos RET`.

1.3 New Features

Changes/New Features in 5.3.1:

- See the docs for 2 ways to install ESS for XEmacs
  1. by uncommenting the XEmacs part of Section 1 of '`Makeconf`' and performing `make install`

2. by unpacking either 'ess-5.3.1.tgz' or 'ess-5.3.1.zip' into 'PREFIX/lib/xemacs/site-packages' on unix or 'PREFIX\XEmacs\site-packages' on windows

- ESS[R]: fixed bugs so that Rterm.exe can be found by XEmacs
- ESS[S]: *ess-toggle-S-assign-key* is slightly changed; in particular, the default `ess-assign-key` is now `C-x =`.
- ESS[R]: *M-x R-site-search* is a new (slightly experimental) utility similar to R's `RSiteSearch(..)` but with the advantage of using Emacs' preferred browser, see `browse-url-browser-function`

Changes/New Features in 5.3.0:

- ESS[BUGS]: sanely re-format statistical output, '`.bog`', from scientific notation to numbers rounded with 4 decimal places with *M-x ess-bugs-sci-round-to-4-dp*.
- The keys for navigating among section headings in help buffers worked, but only for one language per session; they should now work for multiple languages. (They were also broken on Windows machines.)
- ESS[S] long standing buglets in the internal logic for loading lisp code on Windows. Particularly fixed behavior in help mode with S-plus GUI.
- New variable, `ess-use-inferior-program-name-in-buffer-name`, which enables using the executable name instead of the dialect name for R. Feature request.
- ESS[S] *ess-execute-screen-options* now also works correctly when there is more than one window *side-by-side* in the same frame and runs in the correct buffer also when there is more than one S buffer.
- iESS[S] new functions `ess-eval-paragraph-and-step` and `ess-eval-function-or-paragraph-and-step` are bound to keys `C-c C-p` and `C-c C-c` respectively and to the menu in ESS-mode; also bound in the help mode (for evaluating examples).
- ESS[S] new function `ess-toggle-S-assign-key` allows to assign the " `<-` " insertion to an arbitrary key.

Changes/New Features in 5.2.12:

- ESS[SAS]: *M-;* fixed, but the XEmacs function `comment-dwim` may be broken, if so, use *M-x comment-region* and *M-x uncomment-region* instead; only valid PROCs are fontified which is very helpful finding syntax errors (currently supported: BASE, ETS, FSP, GRAPH, IML, INSIGHT and STAT); the "feature" where *F*-keys take you to an empty buffer when the requested destination is a file that does not exist has been fixed, now the request results in a no-op. Further, sas-mode now also works in simple terminals.
- Rterm/Cygwin combination works under Microsoft Windows.
- ESS[R]: internal calls use baseenv() instead of NULL and define 'baseenv' where needed.
- New experimental support for installing ESS. See the file '`lisp/ess-install.el`'.

Changes/New Features in 5.2.11:

- ESS Info entry and '`dir`' handled more effectively for GNU Emacs users
- ESS[SAS]: temporary files created for batch submission of a region are now named based on the current file; see `ess-sas-file-root` for details; all `lag` and `dif` functions now fontified correctly

- iESS[SAS]: fixed a few nagging bugs, however, still does not appear to work at this time; please let us know if you have any ideas.
- ESS[S]: Support for running other versions of Splus has been added for unix. Two new variables, `ess-s-versions` and `ess-s-versions-list`, are used to tell ESS what other versions of Splus you would like to run.

Changes/New Features in 5.2.10:
- ESS[R]: ess-r-versions can no longer be customized (since the customization was not taking effect unless customizations were loaded before ESS). Its value has been changed so that it will also find R executables beginning "R-devel" and "R-patched". If you wish to change this variable, it must be set in your '`.emacs`' before ESS is loaded.
- Installation with GNU Make enhanced: unix and unix-like operating systems will now be able to install ESS for all users in either a GNU Emacs site-lisp or an XEmacs package configuration by editing '`lisp/ess-site.el`' and '`Makeconf`' accordingly, then issuing `make install`
- ESS[S]: Filename completion (inside strings) now also works in XEmacs for R and S-plus.

Changes/New Features in 5.2.9:
- ESS[R] for Windows: the \ directory character bug with respect to ess-load-file has been eradicated.
- iESS[SAS]: `C-c C-r` and `C-c C-b` once again work as intended and documented.
- ESS[S]: M-x ess-fix-EQ-assign is a bit more agressive.
- ESS[S]: Imenu now also shows setAs(), etc.
- ESS[R]: R function pattern enhanced with underlying code such that `M-C-a` (`ess-beginning-of-function`) etc now work for many more cases, including S4 method definitions.
- iESS[R]: myOwnhelp(1) no longer wrongly triggers help(1).
- ESS[R]: Improved detection of bogus help buffers: valid help buffers containing with the string "no documentation"(e.g. contour) were being treated as bogus.
- ESS[R]: In R help buffers, if `options("help.try.all.packages" = TRUE)` then `?rlm` will list which packages rlm is defined in. This help buffer is not bogus, but instead is now relabelled "*help[R](rlm in packages)*".
- ESS[STA]: add "//" as comment starting character to syntax-table.

Changes/New Features in 5.2.8:
- iESS: [Tab] completes **file** names "inside string" as in earlier (<= 5.2.3) ESS versions.

Changes/New Features in 5.2.7:
- If you use Custom to change the variable ess-toolbar-items, the new toolbar is used in all subsequent ESS buffers.
- ESS[SAS]: new feature: if ess-sas-log-max >0 and your .log grows to more than ess-sas-log-max bytes, just the first ess-sas-log-max bytes are refreshed; this is helpful when your .sas program generates lots of error messages and gets too big for emacs to display
- ESS[R/S]: `M-;` in R/S editing modes will now indent with either one or two hashes depending on context.

- ESS[R]: David Whiting's Sweave extensions (to 'noweb') are now available (from ess-swv.el loaded by default).

Changes/New Features in 5.2.6:

- Removed non-ASCII characters in a few files.
- ESS[R]: now works better when UTF-8 locale is active; in particular, you get correct directional quotes in R's startup message for R-devel (unstable development version of R 2.1.0) when using environment variables LANGUAGE=en@quot LC_ALL=en_US.UTF-8
- ESS[SAS]: toggling of .log mode improved (`F10`); toggling of .lst mode now also available (`C-F10`); killing all buffers associated with .sas program no longer bound to `C-F10` since its a bit overzealous.
- S-Plus 7 for Windows is now recognized.
- ESS[S] (incl. R): in auto-fill mode, strings are not wrapped anymore.
- ESS[S] (incl. R): font-lock now correctly differs between R and S, e.g., for `"_"`; both now fontify warning(.) and S does terminate() additionally.
- Support for 'bell' aka 'beep' aka 'ding' aka 'alarm' in all inferior modes: When \a is output "to the the console" at the beginning of a line, the bell is rung.

Changes/New Features in 5.2.5:

- ESS[R]: `C-c C-q` or 'Quit S' from the menu now should work (again and less klunkily) and do not append '-exited' to the buffer name. Further, the behavior of (`ess-cleanup`), called from ess-quit, now depends on the new customizable variable `ess-S-quit-kill-buffers-p` which defaults to `nil`. Consequently, the question *"Delete all buffers associated with ..?"* will not be asked anymore by default.
- ESS[SAS] – ess-ebcdic-to-ascii-search-and-replace will now work with the `recode` application as well which is available on many platforms
- ESS[S] (incl. R): Name completion for slots of S4 objects now works!

Changes/New Features in 5.2.4:

- The documentation now includes an overview of how to use the emacs TAGS facility for S functions. (The distribution also used to contain a directory '`etc/other/Tags`' where a ~1990 version of '`etags.c`' was distributed; this is no longer relevant and so has been deleted.)
- ESS[SAS] – When you are working with EBCDIC files on an ASCII platform, .log NOTEs may display as gibberish since the EBCDIC characters are not converted to ASCII prior to their display. So, the function ess-ebcdic-to-ascii-search-and-replace is provided for convenience and is bound to `C-F11`. This function requires the `dd` command (only available on unix or unix-like platforms).
- ESS: Completion of object names is now always done dynamically rather than allowing the option of using a pre-computed database (by `ess-create-object-name-db`) since modern computers seem fast enough for dynamic completion. (We expect few users, if any, have been using the pre-computed database method.)
- ESS: object completion in iESS buffers running on Windows was very slow (for GNU Emacs, but not XEmacs) and has now been fixed. Further, it was more or less broken

for all versions of S-plus 6.x, and has been fixed to work everywhere but with the Windows' GUI of S-plus. The list of objects now shows unique names also when an object appears more than once in the search path.

- ESS[R]: Completion of object names now also includes those starting with ".".

Changes/New Features in 5.2.3:

- ESS: When new inferior ESS processes are created, by default they will replace the current buffer (this restores behavior from pre 5.2.0). If you wish new ESS processes to start in another window of the current frame, set inferior-ess-same-window to nil.
- New variables inferior-Splus-args and inferior-R-args provide a way to pass command line arguments to starting S and R processes.

Changes/New Features in 5.2.2:

- bug-fixes for 5.2.1 (require 'executable), html docs, etc.
- ess-lisp-directory/../doc/info added to Info-directory-list if ess-info not found by info
- ESS[R]: If you have other versions of R on your exec-path, such as "R-1.8.1" with Unix or "rw1081" with Windows, ESS will find them and create appropriate functions, such as `M-x R-1.8.1` or `M-x rw1081`, for calling them. By default only Unix programs beginning "R-1" and "R-2" and Windows programs parallel to the version of R in your exec-path will be found, but see ess-r-versions and ess-rterm-versions for ways to find other versions of R.
- ESS[R]: Other versions of R, such as "R-1.8.1" on Unix and "rw1081" on Windows, are added to the "ESS / Start Process / Other" menu.
- ESS[S]: If you have other versions of S-Plus on your Windows computer, such as S-Plus 6.1 or S-Plus 4.5, ESS will find them and create appropriate functions, such as `M-x splus61`, for calling the console version (Sqpe) inside an emacs buffer. By default only programs installed in the default location will be found, but see ess-SHOME-versions for ways to find other versions of S-Plus.
- ESS[S]: Other versions of Sqpe on Windows, such as "splus61", are added to the "ESS / Start Process / Other" menu.
- ESS[R]: (bug fix) ess-quit (bound to `C-c C-q`) should now quit the inferior R process, when issued from either the inferior buffer, or from a .R buffer.

Changes/New Features in 5.2.1:

- ESS[S] (R and S-plus): now have toolbar support with icons to evaluate code in the inferior process or to switch there. This code is experimental and likely to change as XEmacs/Emacs issues get resolved. The toolbar should be enabled if your Emacs displays images, but can be disabled with the variable ess-use-toolbar. Thanks to David Smith from Insightful for the S-plus logo.
- ESS[SAS]: ess-sas-graph-view (`F12`) enhanced; you can specify external file viewers for each graphics file type via the alist ess-sas-graph-view-viewer-alist; also .jpg/.gif are now handled by image-mode on XEmacs, if available, otherwise by graphics primitives as before

Changes/New Features in 5.2.0:

- ESS[BUGS]: new info documentation! now supports interactive processing thanks to Aki Vehtari; new architecture-independent unix support as well as support for BUGS v. 0.5

- ESS[SAS]: convert .log to .sas with ess-sas-transcript; info documentation improved; Local Variable bug fixes; SAS/IML statements/functions now highlighted; files edited remotely by ange-ftp/EFS/tramp are recognized and pressing SUBMIT opens a buffer on the remote host via the local variable ess-sas-shell-buffer-remote-init which defaults to "ssh"; changed the definition of the variable ess-sas-edit-keys-toggle to boolean rather than 0/1; added the function ess-electric-run-semicolon which automatically reverse indents lines containing only "run;"; `C-F1` creates MS RTF portrait from the current buffer; `C-F2` creates MS RTF landscape from the current buffer; `C-F9` opens a SAS DATASET with PROC INSIGHT rather than PROC FSVIEW; "inferior" aliases for SAS batch: `C-c C-r` for submit region, `C-c C-b` for submit buffer, `C-c C-x` for goto .log; `C-c C-y` for goto .lst

- ESS[S]: Pressing underscore ("_") once inserts " <- " (as before); pressing underscore twice inserts a literal underscore. To stop this smart behaviour, add "(ess-toggle-underscore nil)" to your .emacs after ess-site has been loaded; ess-dump-filename-template-proto (new name!) now can be customized successfully (for S language dialects); Support for Imenu has been improved; set ess-imenu-use-S to non-nil to get an "Imenu-S" item on your menubar; ess-help: Now using nice underlines (instead of 'nuke-* ^H_')

- ESS[R]: After (require 'essa-r), `M-x ess-r-var` allows to load numbers from any Emacs buffer into an existing *R* process; `M-x ess-rdired` gives a "directory editor" of R objects; fixed ess-retr-lastvalue-command, i.e. .Last.value bug (thanks to David Brahm)

- ESS: Support for creating new window frames has been added to ESS. Inferior ESS processes can be created in dedicated frames by setting inferior-ess-own-frame to t. ESS help buffers can also open in new frames; see the documentation for ess-help-own-frame for details. (Thanks to Kevin Rodgers for contributing code.)

Changes/New Features in 5.1.24:

- The version number is now correct even inside ESS/Emacs

Changes/New Features in 5.1.23:

- Minor more Makefile clean up.

Changes/New Features in 5.1.22:

- Besides info documentation, PDF and HTML documentation are also provided (instead of built using "make") and available on the web as well; see ESS web page and StatLib

- Now that info documentation is available, the README.* files are no longer supported. However, they are still distributed for what it's worth.

- ESS is now an XEmacs package! See XEmacs Installation HOWTO for details (specifically, items 10-15).

- ESS[SAS]: more user-friendly enhancements for remote SAS batch jobs with Kermit file transfers (LOG and OUTPUT function key features now supported). Multiple shells now supported so you can run SAS on different computers from different buffers by setting the buffer-local variable ess-sas-shell-buffer to unique buffer names.

- Major re-vamping of Makefile/Makeconf.

Changes/New Features in 5.1.21:

- ESS[SAS]: info documentation now available!, see ESS->Help for SAS; `F12` opens GSAS-FILE nearest point for viewing either within emacs, when available, or via an external viewer; more syntax highlighting keywords; more enhancements for remote SAS batch jobs with Kermit; new framework for remote SAS interactive jobs, see ess-remote
- ESS[S]: info documentation now available!, see ESS->Help for the S family
- Makefile: tag now independent of rel; info files made by doc/Makefile and installed in new info sub-directory

Changes/New Features in 5.1.20:

- New 'options()$STERM' in the S dialects (S, S-Plus, R). The S program can determine the environment in which it is currently running. ESS sets the option to 'iESS' or 'ddeESS' when it starts an S language process. We recommend other specific values for S language processes that ESS does not start.
- New 'ess-mouse-me' function, assigned to S-mouse-3 by default. User may click on a word or region and then choose from the menu to display the item, or a summary, or a plot, etc. This feature is still under development.
- GNU Emacs 21.1 is now supported (fixed for S dialects, SAS & BUGS), (some from Stephen Eglen).
- XEmacs 21.x is now supported (fixed w32-using-nt bug)
- XEmacs on Win (NT) is better supported.
- Workaround for bug in Sqpe+6 (S-PLUS 6 for Win).
- should now work even when imenu is not available (for old XEmacsen).
- ESS[SAS]: XEmacs-Imenu fix; `C-TAB` is globalized along with your function-key definitions, if specified; you can specify your SAS library definitions outside of autoexec.sas for ess-sas-data-view with SAS code placed in the variable ess-sas-data-view-libname, also the dataset name is defaulted to the nearest permanent dataset to point; Speedbar support now works for permanent datasets, please ignore first./last.; new font-locking is now the default with more improvements for font-locking PROCs, macro statements, * ; and %* ; comments; you can toggle sas-log-mode with `F10` which will font-lock your .log (if it isn't too big); submit remote .sas files accessed with ange-ftp, EFS or Tramp (Kermit is experimental) by setting ess-sas-submit-method to 'sh; ess-sas-submit-command and ess-sas-submit-command-options are buffer-local so you can have local file variable sections at the end of your .sas files to request different executables or specify special options and the local file variables are re-read at submit instead of only at file open so that if you make a change it is picked up immediately;
- ESS[BUGS]: font-lock with 'in' fixed.
- for STATA: font-lock bug fixed.
- for Rd mode: `C-c C-v` and 'switch-process' in menu. further, `C-c C-f` prefix (Rd-font) for inserting or surrounding a word by things such as \code{.}, \code{\link{.}}, \emph{.} etc.
- new functions (ess-directory-function) and (ess-narrow-to-defun) ess-directory <-> default-directory logic (Jeff Mincy).

- Re-organized Makefile and fixed a few bugs.

Changes/New Features in 5.1.19:

- S+6 now supported (Tony Rossini (Unix) and Rich Heiberger (Windows))
- New BUGS support through ESS[BUGS] mode (Rodney Sparapani) Templates assist you in writing .bug and .cmd code (.cmd and .log are replaced by .bmd and .bog to avoid emacs extension collisions). Substitution" parameters facilitate "automagic" generation of data...in" and "init...in" filenames, "const N=" from your data file and "monitor()/stats()" commands. Activated by pressing `F12`.
- Fixes for 'ess-smart-underscore' SAS breakage (Rich Heiberger)
- You can change between PC and Unix, local and global SAS function-key definitions interactively (Rich Heiberger)
- `C-Submit` a highlighted region to SAS batch (Rodney Sparapani)
- New and improved SAS syntax highlighting (Rodney Sparapani) To get the new functionality, set ess-sas-run-make-regexp to nil. Also available in .log files via `F10`.
- Open a permanent SAS dataset for viewing via `F9` (Rodney Sparapani) You must have the library defined in autoexec.sas for it to work.
- User-friendly defaults for 'sas-program', 'ess-sas-batch-pre-command' and 'ess-sas-batch-post-command' as well Customize support for these and other ESS[SAS] variables (Rodney Sparapani)
- 'ess-sas-suffix-2' now defaults to .dat via `F11` (Rodney Sparapani)
- Emacs/XEmacs, Unix/Windows issues collectively handled in ess-emcs.el
- defadvice solves problem of missing *ESS* (thanks to Jeff Mincy)
- Improved manual a bit by including things that were only in 'README'.

Changes/New Features in 5.1.18:

- New 'ess-smart-underscore' function, now assigned to "_" by default. Inserts 'ess-S-assign' (customizable " <- "), unless inside string and comments where plain "_" is used instead. (MM)
- Fixes for longstanding interactive SAS breakage (RMH)

Changes/New Features in 5.1.17:

- Documentation for Windows Installation (Rich Heiberger)
- removal of ess-vars, finalization of customize support (in the sense that there is no more use of ess-vars, but that we need to fix ess-cust) (AJ Rossini)
- Many small (and large) fixes/contributions (MMaechler)
- addition of the "S-equal" variable and provide `M-x ess-add-MM-keys` a way to remap "_" to 'ess-S-assign', typically " <- ", but customizable. (MMaechler)

Changes/New Features in 5.1.16:

- BUG FIXES
- Better SAS support

Changes/New Features in 5.1.15:

- BUG FIXES

Changes/New Features in 5.1.14:

- Yet more fixes to SAS mode, (Rich Heiberger and Rodney Sparapani)
- Customize support (for most Emacsen which support it) (AJRossini)
- ARC and ViSta support out of the box, and fixes for XLispStat (AJRossini)

Changes/New Features in 5.1.13:

- Version numbering finally all depending on the ./VERSION file, thanks to Martin Maechler.
- Yet more fixes to SAS mode, thanks to Rich Heiberger.

Changes/New Features in 5.1.12:

- Splus 5.1 stabilized, thanks to Martin Maechler, Bill Venables, Chuck Taylor, and others.
- More fixes to SAS mode, thanks to Rodney Sparapani and Rich Heiberger.

Changes/New Features in 5.1.11:

- More fixes to Stata mode, thanks to Brendan Halpin.
- fixed bugs in ESS-elsewhere, thanks to many testers
- README.SPLUS4WIN has DETAILED instructions for S-PLUS 2000, thanks to David Brahm.
- Fixes to SAS mode, thanks to Rodney Sparapani

Changes/New Features in 5.1.10:

- More fixes to Stata mode
- primitive generic version of ESS-elsewhere
- Small fixes to SAS/Stata.

Changes/New Features in 5.1.9:

- Stata mode works
- Literate Data Analysis using Noweb works

Changes/New Features in 5.1.8:

- Bug fixes
- R documentation mode defaults changed

Changes/New Features in 5.1.2:

- able to use inferior iESS mode to communicate directly with a running S-Plus 4.x process using the Microsoft DDE protocol. We use the familiar (from Unix ESS) `C-c C-n` and related key sequences to send lines from the S-mode file to the inferior S process. We continue to edit S input files in ess[s] mode and transcripts of previous S sessions in ESS Transcript mode. All three modes know the S language, syntax, and indentation patterns and provide the syntactic highlighting that eases the programming tasks.

1.4 Current Features

- Languages Supported:
  - S family (S 3/4, S-PLUS 3.x/4.x/5.x/6.x/7.x, and R)
  - SAS
  - BUGS
  - Stata
  - XLispStat including Arc and ViSta
- Editing source code (S family, SAS, BUGS, XLispStat)
  - Syntactic indentation and highlighting of source code
  - Partial evaluation of code
  - Loading and error-checking of code
  - Source code revision maintenance
  - Batch execution (SAS, BUGS)
  - Use of imenu to provide links to appropriate functions
- Interacting with the process (S family, SAS, XLispStat)
  - Command-line editing
  - Searchable Command history
  - Command-line completion of S family object names and file names
  - Quick access to object lists and search lists
  - Transcript recording
  - Interface to the help system
- Transcript manipulation (S family, XLispStat)
  - Recording and saving transcript files
  - Manipulating and editing saved transcripts
  - Re-evaluating commands from transcript files
- Help File Editing (R)
  - Syntactic indentation and highlighting of source code.
  - Sending Examples to running ESS process.
  - Previewing

1.5 Stability

Versions 5.3.x are meant to be release-quality versions. While some new features are being introduced, we are cleaning up and improving the interface. We know about some remaining documentation inconsistencies. Patches or suggested fixes with bug reports are much appreciated!

1.6 Requirements

ESS has been tested with

- R >=0.49
- S-PLUS 3.3-4, 4.5, 5.0-1, 6.0-2, 7.0, 2000
- S4
- SAS >=6.12
- BUGS 0.5, 0.603
- Stata >=6.0
- XLispStat >=3.50

on the following platforms

- Linux (all)
- Solaris/SunOS (all)
- Microsoft Windows 95/98/NT/2000/XP (R, SPLUS 4.5/6.0-2/7.0/2000, SAS and BUGS)
- Apple Mac OS (SAS for OS 9 and R for OS X)

with the following versions of emacs

- GNU Emacs 20.3-7, 21.1, 21.3-4, 22.0.50-pretesting
- XEmacs 21.0, 21.1.13-14, 21.4.0-8, 21.4.9-13[1], 21.4.14-15, 21.4.17-18, 21.5.23

1.7 Getting the Latest Version

The latest released version of ESS is always available on the web at: ESS web page or StatLib

The latest development version of ESS is available via https://svn.R-project.org/ESS/,█ the ESS Subversion repository. If you have a Subversion client (see http://subversion.tigris.org/),█ you can download the sources using:

    % svn checkout https://svn.r-project.org/ESS/trunk *path*

which will put the ESS files into directory *path*. Later, within that directory, 'svn update' will bring that directory up to date. Windows-based tools such as TortoiseSVN are also available for downloading the files. Alternatively, you can browse the sources with a web browser at: ESS SVN site. However, please use a subversion client instead to minimize the load when retrieving.

If you remove other versions of ESS from your emacs load-path, you can then use the development version by adding the following to .emacs:

    (load "/path/to/ess-svn/lisp/ess-site.el")

Note that https is required, and that the SSL certificate for the Subversion server of the R project is

---

[1] require the files.el patch to revert-buffer for the Local Variables updating problem

```
    Certificate information:
     - Hostname: svn.r-project.org
     - Valid: from Jul 16 08:10:01 2004 GMT until Jul 14 08:10:01 2014 GMT
     - Issuer: Department of Mathematics, ETH Zurich, Zurich, Switzerland, CH█
     - Fingerprint: c9:5d:eb:f9:f2:56:d1:04:ba:44:61:f8:64:6b:d9:33:3f:93:6e:ad█
```

(currently, there is no "trusted certificate"). You can accept this certificate permanently
and will not be asked about it anymore.

1.8 Installation (from tar file)

We now discuss installation, which might happen under Unix or Microsoft Windows.
First, we discuss Unix installation. See Section 1.9 [Unix installation], page 12.

For Microsoft Windows Installation please skip to the See Section 1.10 [Microsoft Windows installation], page 13.

1.9 Unix installation

1. `cd` to a directory where you want to install ESS, creating it if necessary. This directory
   will be referred to below as 'ESSDIR'.
2. Retrieve the latest version from ESS downloads area to 'ESSDIR'.
3. Decompress/unarchive the files from the disribution.

   Either, `gunzip < ess-VERSION.tgz | tar xf -`,
   or using GNU tar, `tar zxf ess-VERSION.tgz`.

   The `tar` command will create the subdirectory 'ess-VERSION' and install the files there.
4. Edit the file 'ESSDIR/ess-VERSION/lisp/ess-site.el' as explained in the comments
   section of that file.
5. Add the line

   `(load "ESSDIR/ess-VERSION/lisp/ess-site")`

   to your user or system installation file (GNU Emacs uses '$HOME/.emacs' and XEmacs
   uses '$HOME/.xemacs/init.el' for the user initialization file. GNU Emacs uses
   'default.el' or 'site-init.el' and XEmacs uses 'site-start.el' for the system
   installation file).

   Alternatively, if 'ess-site.el' is in your current `load-path`, then:

   `(require 'ess-site)`

   to configure emacs for ESS.
6. That's it! If you are installing just a local copy of ESS for yourself, ESS is now ready
   to be used. (The remaining step below is for advanced installation.) To edit statistical
   programs, load the files with the requiste extensions ('.sas' for SAS, '.S' for S-PLUS,
   '.R' for R, and '.lsp' for XLispStat). To start a statistical process within emacs, such
   as R, type `M-x R`.
7. **(OPTIONAL) READ THIS ITEM THOROUGHLY BEFORE STARTING**:

   If you want to place the compiled files in other locations edit the `LISPDIR`, `INFODIR`
   and `ETCDIR` entries in Section 1 of 'Makeconf' in the 'ESSDIR/ess-VERSION' directory
   (if you are using XEmacs, then see the XEmacs subsection in Section 1 of 'Makeconf').
   You can compile those files by:

```
make all
```

When that completes successfully, install the compiled files:

```
make install
```

Note: ESS is no longer available as an XEmacs package. But, you can still install ESS into the XEmacs package system by choosing the appropriate directory for unpacking as follows: 'PREFIX/lib/xemacs/site-packages' on unix or 'PREFIX\XEmacs\site-packages' on windows *Note:* ESS will work best if the XEmacs sumo tarball (all XEmacs packages combined) has been installed. For more information on installing XEmacs packages, see Quickstart Package Guide.

1.10 Microsoft Windows installation

For **Microsoft Windows installation**, please follow the next steps: (see separate instructions above for UNIX See Section 1.9 [Unix installation], page 12.

1. `cd` to a directory where you keep emacs lisp files, or create a new directory (for example, 'c:\emacs\') to hold the distribution. This directory will be referred to below as "the ESS distribution directory".

2. Retrieve the latest zip file ('ess-VERSION.zip') or compressed tar file 'ess-VERSION.tgz' from ESS downloads area and store it in the ESS distribution directory. Be aware that http browsers on Windows frequently change the "." and "-" characters in filenames to other punctuation. Please change the names back to their original form.

3. Extract all the files from 'ess-VERSION.zip' or 'ess-VERSION.tgz' into the ESS distribution directory as 'c:\emacs\ess-VERSION\'. You may use the commands 'unzip' on the zip archive or 'gunzip' and 'tar' on the tgz file. It is possible to unpack the zip archive in Windows Explorer, by double clicking on the folder; you should then see a new folder called 'ess-VERSION'. Drag that folder into your ESS distribution directory.

4. Add the line

```
(load "C:/emacs/ess-VERSION/lisp/ess-site")
```

to your emacs initialization file. (GNU Emacs uses the filename '~/.emacs' and XEmacs uses the filename '~/.xemacs/init.el' for the initialization file. The tilde is recognised by emacs as your HOME directory, i.e. the value of your HOME environment variable.) Replace `VERSION` above with the version number of ESS. Remember to use forwardslashes /, rather than backslashes \, in your filename inside emacs code files.

After saving your initialization file, ESS is now installed. Start a new emacs and you should be ready to use ESS. For example, to edit statistical programs, load the files with the requisite extensions (".sas" for SAS, ".S" or "s" or "q" or "Q" for S-PLUS, ".r" or ".R" for R, and ".lsp" for XLispStat). One further step is needed if you wish to run statistical processes, see below.

5. To run statistical processes under ESS, Windows users will need to make sure that the directories for the software they will be using is in the PATH environment variable. On Windows 9x, add lines similar to the following to your 'c:\autoexec.bat' file:

```
path=%PATH%;c:\progra~1\insightful\splus70\cmd
```

On Windows NT/2000/XP, add the directories to the PATH using the `My Computer/Control Panel/System/Advanced/Environment Variables` menu. Note that the directory containing the program is added to the PATH, not the program itself. One such line is needed for each software program. Be sure to use the abbreviation `progra~1` and not the long version with embedded blanks. Use backslashes `"\"`.

An alternative, for R users, is that rather than adjusting the PATH variable, you can add the following to your emacs initialization file (and restart emacs):

```
(setq inferior-R-program-name "C:/progra~1/R/R-2.2.1/bin/Rterm.exe")
```

This assumes that you have installed R-2.2.1 in the default location. Change the path otherwise to point to other locations.

Windows users who place S-PLUS anywhere other than the default location will also need to add the following three lines (properly adjusted for their location) to their '%HOME%/.emacs' or '%HOME%/.xemacs/init.el' file:

```
(setq-default inferior-S+6-program-name
    "c:/progra~1/Insightful/SPLUS70/cmd/Splus")
(setq-default inferior-Sqpe+6-SHOME-name
    "c:/progra~1/Insightful/SPLUS70")
(setq-default inferior-Sqpe+6-program-name
    "c:/progra~1/Insightful/SPLUS70/cmd/Sqpe.exe")
```

The above example uses the default location of S-PLUS in `c:/progra~1/Insightful`. Please note that ESS considers S-PLUS 6, 7, and 8 to be variants of S+6.

These users may also need to modify the emacs variable `ess-SHOME-versions` to match their installation in order to get the full set of S-PLUS versions on their machine into the `ESS` menu.

To start the S-PLUS [678].x GUI from ESS under emacs:

1. If you use Cygwin bash as your primary shell, then

    ```
    M-x S
    (or M-x S+6).
    ```

2. If you use the MSDOS prompt window as your primary shell, then

    ```
    M-x S+6-msdos
    ```

You will then be asked for a pathname ("S starting data directory?"), from which to start the process. The prompt will propose your current directory as the default. ESS will start the S-PLUS GUI. There will be slight delay during which emacs is temporarily frozen. ESS will arrange for communication with the S-PLUS GUI using the DDE protocol. Send lines or regions from the emacs buffer containing your S program (for example, '`myfile.s`') to the S-PLUS Commands Window with the `C-c C-n` or `C-c C-r` keys. (If you are still using S-PLUS 4.x or 2000,\ then use `M-x S+4` or `M-x S+4-msdos`.)

To start an S-PLUS [678].x session inside an emacs buffer—and without the S-PLUS GUI:

```
M-x Sqpe
(or M-x Sqpe+6).
```

This works with both the bash and msdos shells. You will then be asked for a pathname ("S starting data directory?"), from which to start the process. The prompt will propose your current directory as the default. You get Unix-like behavior, in particular the entire transcript is available for emacs-style search commands. Send lines or regions from the emacs buffer containing your S program (for example, 'myfile.s') to the *S+6* buffer with the `C-c C-n` or `C-c C-r` keys. Interactive graphics are available with Sqpe by using the java library supplied with S-PLUS 6.1 and newer releases. Enter the commands:

```
library(winjava)
java.graph()
```

Graphs can be saved from the `java.graph` device in several formats, but not PostScript. If you need a PostScript file you will need to open a separate `postscript` device. (If you are still using S-PLUS 4.x or 2000, then use `M-x Sqpe+4`.)

To connect to an already running S-PLUS GUI (started, for example, from the S-PLUS icon):

```
M-x S+6-existing
```

or

```
M-x S+6-msdos-existing
```

You will then be asked for a pathname ("S starting data directory?"), from which to start the process. The prompt will propose your current directory as the default. ESS will arrange for communication with the already running S-PLUS GUI using the DDE protocol. Send lines or regions from the emacs buffer containing your S program (for example, 'myfile.s') to the S-PLUS Commands Window with the `C-c C-n` or `C-c C-r` keys. (If you are still using S-PLUS 4.x or 2000, then use `M-x S+4-existing` or `M-x S+4-msdos-existing`.)

If you wish to run R, you can start it with:

```
M-x R
```

XLispStat can not currently be run with

```
M-x XLS
```

Hopefully, this will change. However, you can still edit with emacs, and cut and paste the results into the XLispStat *Listener* Window under Microsoft Windows.

6. That's it!

1.11 Reporting Bugs

Please send bug reports, suggestions etc. to ESS-bugs@stat.math.ethz.ch

The easiest way to do this is within Emacs by typing

M-x ess-submit-bug-report

This also gives the maintainers valuable information about your installation which may help us to identify or even fix the bug.

If Emacs reports an error, backtraces can help us debug the problem. Type "M-x set-variable RET debug-on-error RET t RET". Then run the command that causes the error and you should see a *Backtrace* buffer containing debug information; send us that buffer.

Note that comments, suggestions, words of praise and large cash donations are also more than welcome.

1.12 Mailing Lists

There is a mailing list for discussions and announcements relating to ESS. Join the list by sending an e-mail with "subscribe ess-help" (or "help") in the body to ess-help-request@stat.math.ethz.ch; contributions to the list may be mailed to ess-help@stat.math.ethz.ch. Rest assured, this is a fairly low-volume mailing list.

The purposes of the mailing list include

helping users of ESS to get along with it.

discussing aspects of using ESS on Emacs and XEmacs.

suggestions for improvements.

announcements of new releases of ESS.

posting small patches to ESS.

1.13 Authors

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