

Cleanscape Lint-Plus GUI User's Guide

Version 6.2



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PART I Introduction

1.1 WELCOME

Thank you for your product purchase! With Cleanscape Lint-Plus (Lplus), you now have four static source analyses to assist in the development of ANSI C code. Lplus in its command-line form has been assisting C programmers for over 15 years; the GUI is an ease-of-use enhancement to the venerable Lplus product for a new generation programmers – and anyone tired of command prompts or desiring the productivity gains from using a GUI.

1.2 DOCUMENTATION

This is the “quick start” guide for the Lplus static analyzer. There are two modes of Lplus operation:

- A. *Cleanscape GUI*
- B. *Command line*

This document's sole purpose is to describe the ease-of-use enhancements provided by Cleanscape GUI over the Lplus command-line product. Lplus is very rich in analysis controls and reporting; to gain maximum benefit from your product purchase, we urge you to read and keep handy the companion document, [Lplus Reference Manual](#) (last bookmark in the Acrobat .pdf version of this document).

While on the topic of documentation: if you use the Cleanscape GUI, be sure to check out the Online Help facility! It's concise yet useful information. The Table of Contents and many interrelated items in the help text are hyperlinked to make information access quick and easy.

1.3 PURPOSE

A. *Function*

1. Lplus is a programming tool that simplifies the debugging and maintenance of both large and small C programs. The Lplus GUI provides ease-of-use enhancements to the venerable Lplus command line product.
2. The Lplus source code analyzer can detect numerous potential problems, including:
 - a. Inappropriate arguments passed to functions
 - b. Inappropriate library calls
 - c. Non-portable code
 - d. Type usage conflicts across different modules
 - e. Unused variables and dead code

B. Application

1. Lplus can be used to:

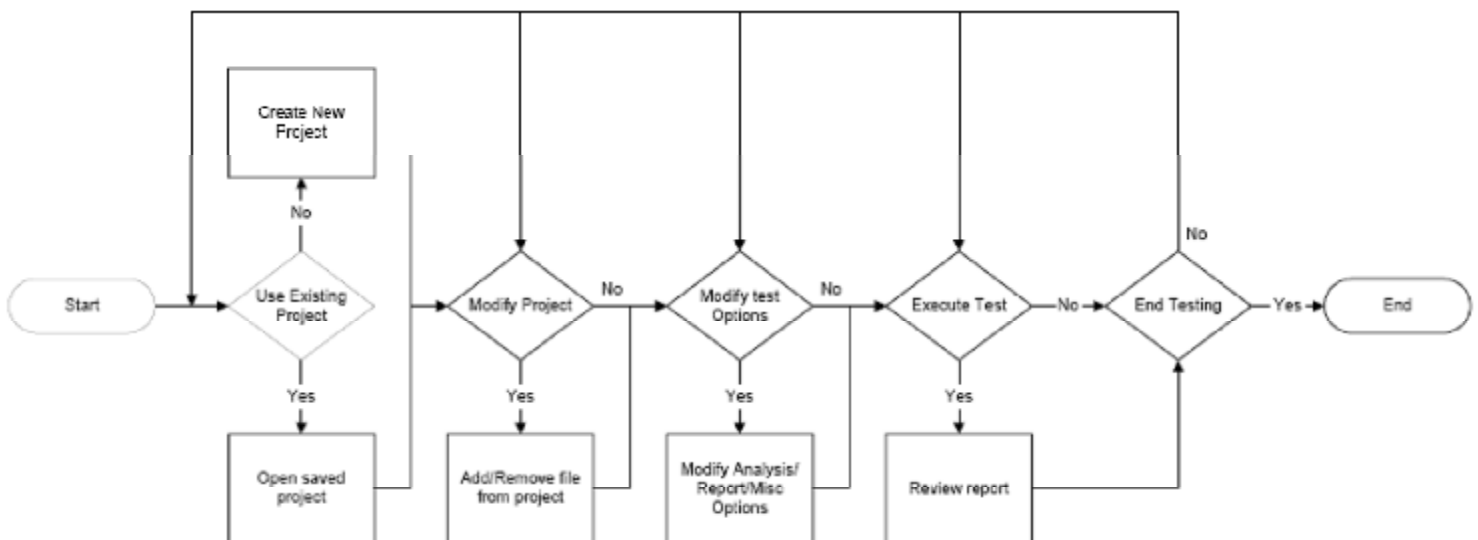
- a. Check source files before they are compiled
- b. Isolate obscure problems
- c. Identify problems before debugging is required
- d. Documentation (call trees, cross reference)

C. Advantages

1. The diagnostic messages produced by Lplus are more detailed than those produced by standard compilers, and cover a wider range of syntactic and semantic problems.
2. Lplus analyzes source files both individually and as a group, and can therefore identify problems that are beyond the scope of a compiler.
3. Lplus is effective in reducing development time and improves C programming style.

D. Flow of Analysis

1. The following flowchart illustrates the Lplus test process:



PART II Requirements, Installation, and Uninstallation

2.1 WINDOWS

A. System Requirements

1. Hardware

Any configuration sufficient to run Windows is sufficient for Lplus.

2. Operating System

- a. Microsoft Windows 98® and 98® SE
- b. Microsoft Windows NT® 4.0 with Service Pack 6a (SP6a)
- c. Microsoft Windows 2000® with Service Pack 2 (SP2)
- d. Microsoft Windows XP® with Service Pack 2 (SP2)
- e. Microsoft Windows Vista®

3. Web Browsers

- a. Firefox® 1.2 or above
- b. Microsoft Internet Explorer® 5.x or above
- c. Opera® 6.x or above
- d. Mozilla® 1.7 or Netscape Navigator® 4.7x or above

B. Software Setup Procedure

1. Installation

- a) Copy `lpinst.exe` to a temporary directory, then run it.
- b) An installer window should appear. Click the OK button. This should extract a number of files to “cleanscape\lplus” under the directory contained in environment variable `%PROGRAMFILES%`. For Win98, Lplus uses `c:\progra~1`. The installer exits automatically, and no reboot is required.
- c) The installer automatically creates a shortcut for the Lplus GUI on the desktop. To run the GUI, double-click the shortcut.
- d) The installer adds the “main” subdirectory to your system PATH – necessary for running Lplus (or any of its associated support programs) from the command line. To do this manually, run this command:

```
set PATH=%PATH%;%PROGRAMFILES%\cleanscape\lplus\main
```

You must exit any MS-DOS shells (i.e., `cmd.exe` prompts) in WinNT+ or reboot your Win98 system for this setting to take effect (this is a Windows limitation).
- e) Double-click the LintPlus icon on your desktop to start the program, and follow the instructions to obtain a license key.

2. Additional steps for Windows 2000

If you're going to install Lplus under Windows 2000 as Administrator, and you want to make the program accessible to ordinary “Users”, some additional steps are required. For more information, see [Section 6.1](#).

C. Uninstallation – manual process

a) Delete the following directory (including subdirectories):

`%ProgramFiles%\cleanscape\lplus`

b) Remove the Lplus shortcut from the desktop

c) Delete the Cleanscape directory from your PATH:

- **In Windows 98, delete the appropriate “set path=” statement from your `c:\autoexec.bat` file.**
- **In Windows NT/2K/XP/Vista, right click your “My Computer” icon on the desktop, select “Properties”, click the “Advanced” tab, click the “Environment Variables”, double-click the text field “Path” in the System Variables area, and from that string, delete “`c:\progra~1\cleanscape\lplus\main`” (or equivalent).**

You can also restore your system to the point just before Lplus installation – NOT available for Windows NT/2k!

The Lplus installer created a Windows system restore point just prior to installation. If you have not added new programs in the interim, you can safely roll your system back to this point. For Win98, use “`scanreg /restore`”.

2.2 UNIX/LINUX

A. System Requirements

1. Hardware

A minimum of 256 MB memory is required for Lplus GUI.

2. Operating System. At the time of this writing, the GUI version may differ amongst the various host OSes.

- a. Most GNU/Linux OSes, including RedHat®, SuSE®, Debian®, Ubuntu®
- b. Mac OS-X® Tiger
- c. Sun Solaris®
- d. HP HP-UX®, Tru64®
- e. SGI Irix®
- f. IBM AIX®

3. Web Browsers

- a. Firefox® 1.2 or above
- b. Mozilla® 1.7 or Netscape Navigator® 4.7x or above
- c. Opera® 6.x or above

B. Software Setup Procedure

Installation – installation as root is easier and recommended. Refer to the [installation notes](#) for details.

a) Copy the appropriate version of `lplusgui620_<host>.taz` to a temporary directory, e.g., `/tmp`.

b) Create directory `/usr/local/cleanscape`, and `cd` to it.

c) Use the following command to extract the files (root prompt left of '#'):

```
/usr/local/cleanscape# tar -xvzf /tmp/lplusgui620_<host>.taz
```

or the following two commands if the 'z' option is not available in 'tar':

```
/usr/local/cleanscape# unzip /tmp/lplusgui620_<host>.taz
```

```
/usr/local/cleanscape# tar -xvf /tmp/lplusgui620_<host>.tar
```

d) Set the PATH (bash example):

```
/usr/local/cleanscape# export PATH=/usr/local/cleanscape:$PATH
```

If you plan to use the command line interface, run these commands:

```
/usr/local/cleanscape# export IPTLINT=\
```

```
  /usr/local/cleanscape/lplusgui.dir/main
```

```
/usr/local/cleanscape# export PATH=$IPTLINT:$PATH
```

e) Start the GUI:

```
/usr/local/cleanscape# lplusgui &
```

and follow the instructions to obtain a license key.

C. Uninstallation – manual process

Delete the following file and directory (including subdirectories):

```
/usr/local/cleanscape# rm /usr/local/cleanscape/lplusgui
```

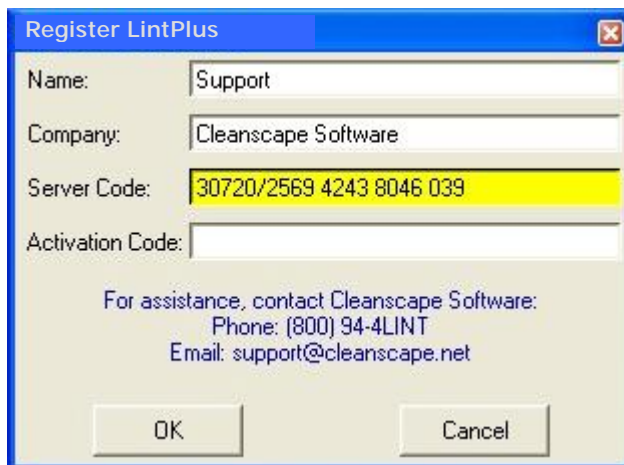
```
/usr/local/cleanscape# rm /usr/local/cleanscape/lplusgui.dir
```

PART III Activating Lplus

A. Registration Process – GUI

The first time that you run the program, a registration prompt will be displayed. You must "register" the program before you can use it. This will run every time the activation key (provided by Cleanscape) expires.

1. If Lplus is not registered, a dialog box will be displayed. The following dialog will appear (NOTE: your server code will be different!):

A screenshot of a Windows-style dialog box titled "Register LintPlus". It contains four text input fields: "Name:" with "Support", "Company:" with "Cleanscape Software", "Server Code:" with "30720/2569 4243 8046 039" (highlighted in yellow), and "Activation Code:" which is empty. Below the fields, it says "For assistance, contact Cleanscape Software: Phone: (800) 94-4LINT Email: support@cleanscape.net". At the bottom are "OK" and "Cancel" buttons.

2. To obtain your activation key, contact Cleanscape Software and provide the server code listed on the "Register LintPlus" window. The "Server Code" is on the line with a yellow background. HINT: Highlight the server code with your mouse, then type CTRL-C on your keyboard to copy the server code.
To reach Cleanscape, call 800-944-5468 (94-4LINT) or send email to support@cleanscape.net.
3. Enter your name, company name and the activation key. HINT: Copy the activation key from your email from Cleanscape, then paste it by typing CTRL-V on your keyboard. When ready, press OK.
4. You should then see an "About LintPlus" dialog box. At this stage, Lplus is now registered and operational. If you do not see this dialog box, contact Cleanscape for further assistance (see #2 directly above for contact info).
5. Unix/Linux: Your registration screen also has two options: "Single-User or Network Server" and "Network Client". The former is used to configure demo licenses, node-locked systems, or the server in a multi-user (floating) environment; the latter is used only for each client workstation in a floating environment.

B. Registration Process – command line

0. If you wish, you can register the product using the GUI – the license key is created and stored correctly using either method. Just be sure to set up the environment variables per the instructions in [Section 2.1.B.1](#) or [Section 2.2.B](#) above! If you use this method, you can skip the rest of this section.

1. Run the command, `lplus -license=activate`

Hit <Enter> to leave the number of license servers at its default of 1.

The next line from the activation program will contain your server code. On Windows machines, it starts with “30720/”.

To obtain your activation key, contact Cleanscape Software and provide this server code.

To reach Cleanscape, call 800-944-5468 (94-4LINT) or send email to support@cleanscape.net.

2. Once the activation key is entered, Lplus is registered and operational.

The next two sections describe in detail the operation your Cleanscape product

- from the GUI [Part IV](#)
- from the command line [Part V](#)

PART IV Running the Lplus GUI

A. Overview

The Cleanscape GUI is a tried-and-true graphical interface used successfully for years. It is also the planned interface for future C/C++ and Java analyzers and test tools.

The Cleanscape GUI provides hyperlinking between the various reports (in the Reports frame) and the line of source in the source file that caused the message.

Advantages of the Cleanscape GUI include:

- Fast
- Easy to learn, navigate, and use
- Information readily at the programmer's fingertips
- Point-and-click control for options-laden Lplus command-line product. NOTE: Your suggestions to improve this ease-of-use feature are appreciated! Email suggestions/comments to sales@cleanscape.net.

Supported code editors are below. It is also possible for you to integrate your own editor! See [Section 6.2](#) for details on the `seteditor` program. User contributions are welcome and will be placed in a "master" file at http://www.cleanscape.net/products/contributed_editors.html

Windows editors:

- | | |
|-------------------------------|-----------------------------|
| • Borland CodeWright | • Starbase CodeWright |
| • Crimson Editor | • TextPad |
| • Emacs | • UltraEdit |
| • Epsilon Programmer's Editor | • Visual SlickEdit |
| • GVim | • Visual Studio 6 * |
| • GWD Text Editor | • Visual Studio .NET 2003 * |
| • MultiEdit | • Visual Studio 2005 * |

Unix/Linux editors:

- | | |
|----------|----------|
| • Elvis | • NEdit |
| • Emacs | • Pico * |
| • Jed * | • Vi * |
| • Joe * | • Vim * |
| • Nano * | • XEmacs |

* Multiple instances of these editors will open with each link click.

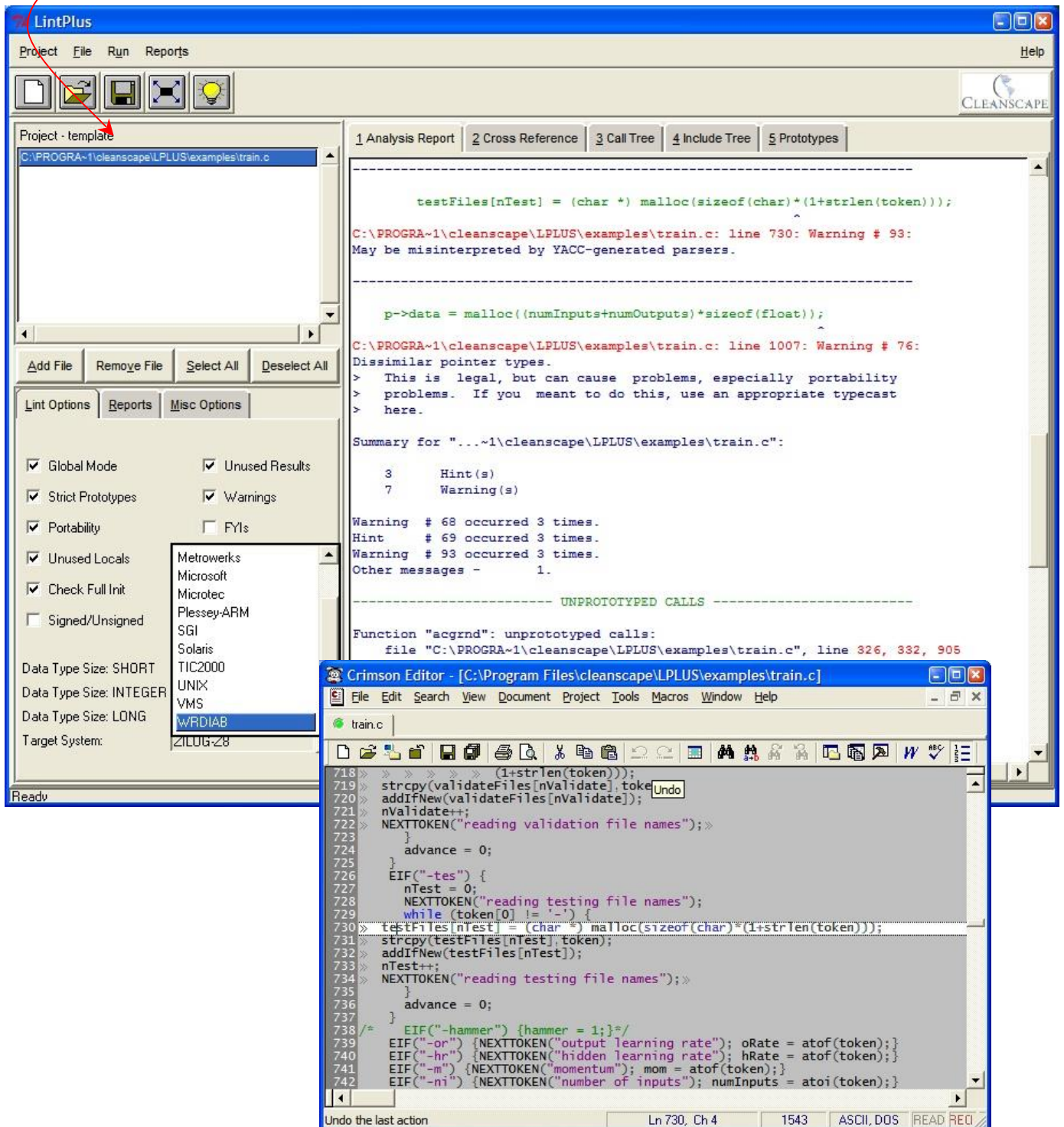
All elements of the GUI are controllable from the keyboard; this is discussed in [Section K](#) below.

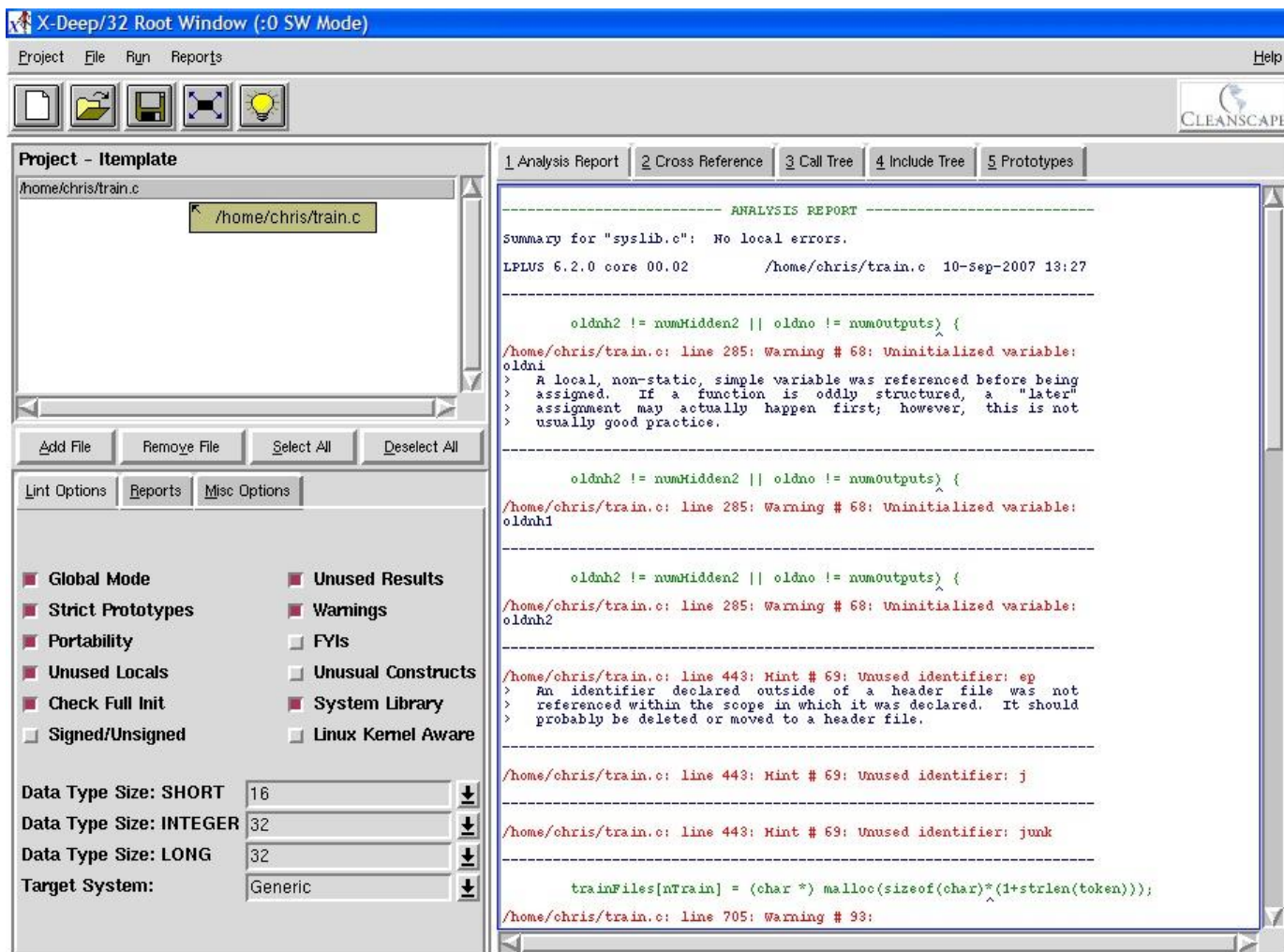
The following screenshots depict sample GUI sessions.

NOTE: Below, a sample Unix/Linux screen shot is shown in addition to one from Windows. All subsequent screen shots are Windows-based, but the functionality is identical between the two environments.

The Crimson Editor (previously selected in the [Reports tab](#) in the lower left frame) was activated when the “**line 730 Warning #93**” hyperlink near the top of the Analysis Report was left-mouse-clicked. Lplus positioned the editor to the line in the source file that caused the analysis result.

It is possible to open any file listed in the Project window (upper left frame of the GUI) by right-mouse-clicking (Windows) or middle-mouse-clicking (Unix/Linux) on the desired filename.





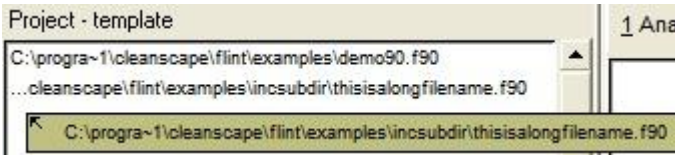
The Lplus GUI remembers settings (e.g., checkboxes, include path, external editor – but not filenames) from the previous session by creating a template file in the “bin” subdirectory on Windows or your home directory on Unix/Linux. There is no template file upon installation.

B. Components

Where possible, each component features “balloon” help which will appear if you hover the mouse over an item or control description. Additional help for each item may be found in the Online Help (see [Section 4.I](#)).

1. Program menu: 

2. Shortcut bar: 

3. Project window: 

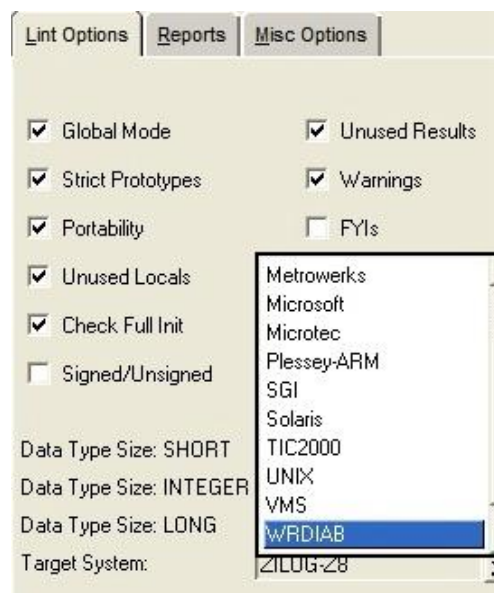
Any file listed in the Project window can be opened in the selected editor by right-mouse-clicking (Windows) or middle-mouse-clicking (Unix/Linux) the filename. Any filenames too long to fit the window are shortened to ~60 characters and an ellipsis is prepended. The full filename appears in a balloon tip if hovering the mouse over the name, as shown above.

4. Project shortcut buttons: 

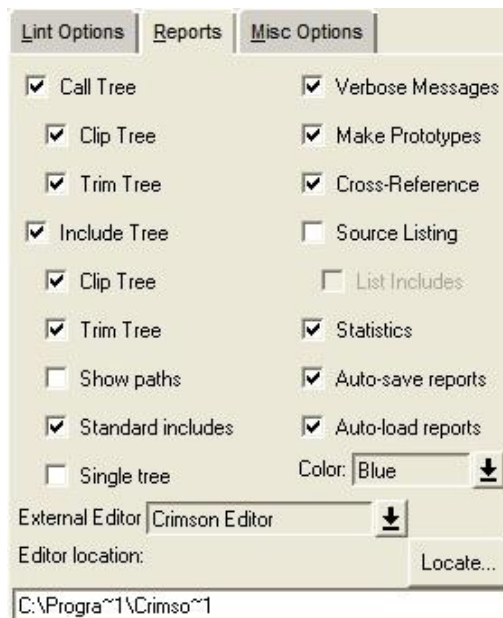
5. Lint Options tab (with “Target System” listbox activated).

This kind of point-and-click control makes using the options-laden Lplus command-line product easy! NOTE: Your suggestions to improve this feature are appreciated – email suggestions to sales@cleanscape.net.

USAGE NOTE: Individual analyses can be enabled/disabled by number in the appropriate text box on the [Miscellaneous Options tab](#).

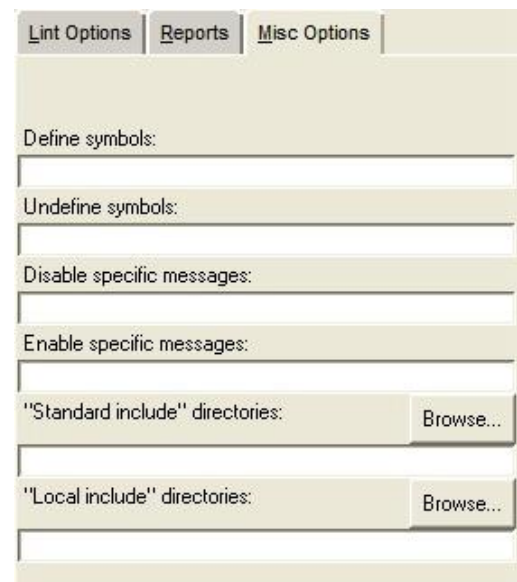


6. **Report Options tab.** Here you can enable/refine or disable the call tree, cross reference, and include tree reports. Other options include refining to the analysis (lint) report, selecting the external editor, and generating prototypes.

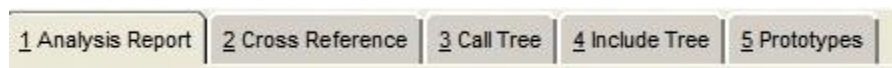


7. **Miscellaneous Options tab.** This tab includes the ability to

- Define/undefine symbols to follow specific preprocessor branches
- Enable/disable specific error messages as defined in the [Lplus Reference Manual](#) (last bookmark in the Acrobat .pdf version of this file).
- Specify the standard and local include directories. This distinction is important to restrict reporting to your sourcebase (skipping results for system header files).



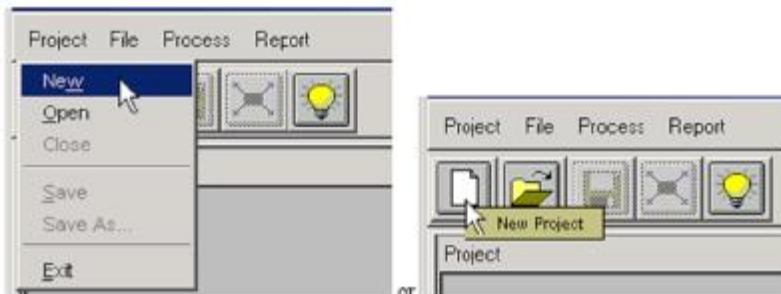
8. **Report windows:**



Example reports appear in [Section H](#) below.

C. Creating a new project

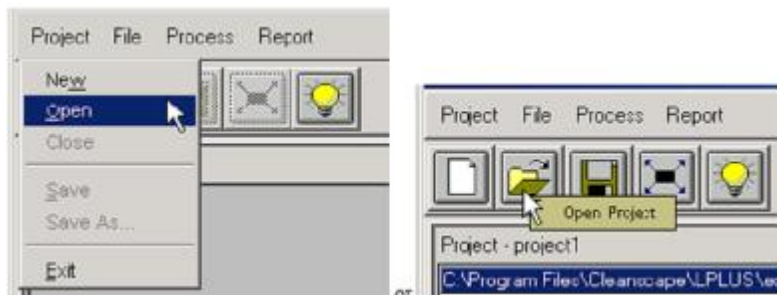
1. To create a new project, select Project/New from the menu or press the New Project button on the shortcut bar. Note: If a project is already open, a dialog box will prompt you to save the old project first.



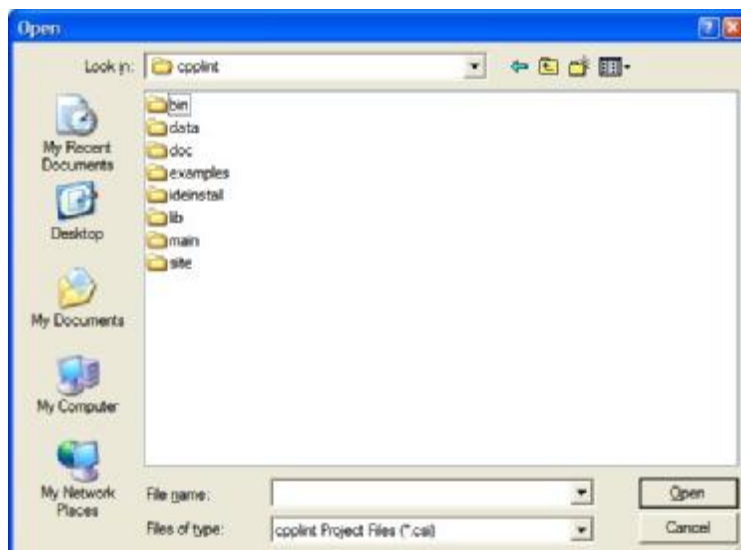
2. A default project name appears in the title, which can be saved to any desired name later.

D. Opening an existing project

1. To open an existing Cleanscape GUI project, select Project/Open from the menu or press the Open Project button on the shortcut bar:

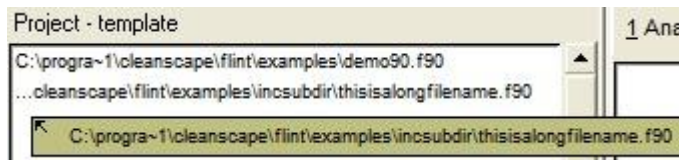


2. The Open dialog will appear:

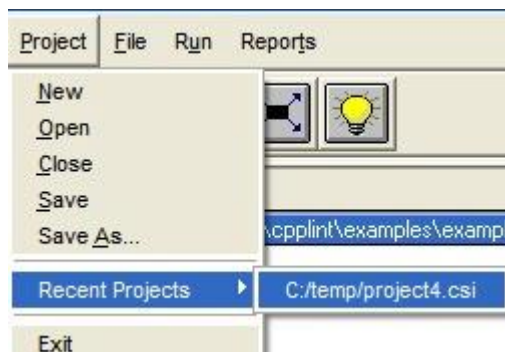


- a. Browse to find/select a project file (with extension `.csi`).
- b. When ready, press the Open button in the lower right corner.

3. Files associated with the project are displayed in the Project window:

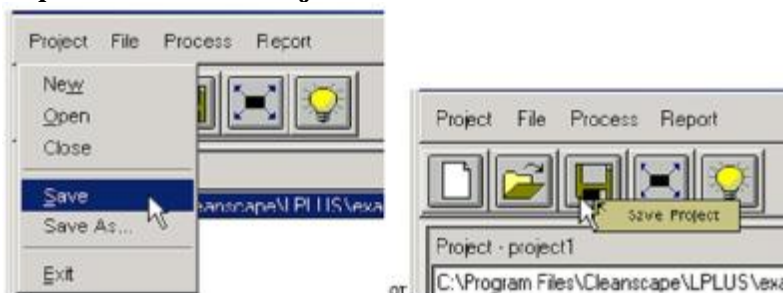


4. It is also possible to open recent projects using the Recent Projects menu:



E. Saving a project

1. To save the current state of a project, select Project/Save from the menu or press the Save Project button on the shortcut bar:



2. If this is a new project, the Save As window will appear.
 - a. Enter a name for the project.
 - b. When done, press the Save button.
 - c. You can also use the "Save As..." feature in the Project dropdown to save an existing project under a new name.

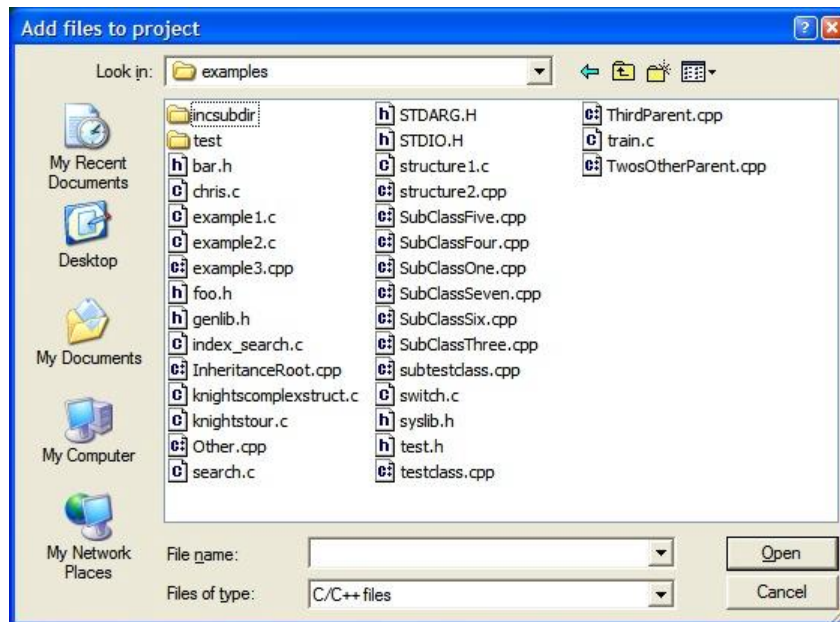
F. Modifying a project

1. Add files to a project

- a. To add one or more files to a project, select File/Add File from the menu to add files into the project or press the Add File button on the project shortcut bar:



- b. The Add file window will appear:



- c. For the Lplus GUI, C source files will be the default file type (.c).

UNIX NOTE: The default file type can be modified by entering the appropriate type in the Filter textbox at the bottom of the dialog.

- 1) The file-selection dialog supports multiple-file selection under both MS-Windows and UNIX.
- 2) To add multiple files individually, use <Control> + Left Mouse Button. Each selected file will be highlighted.
- 3) To add a group of files:
 - (i) Left-click on the first file.
 - (ii) Hold down the <Shift> key.
 - (iii) Click the last file desired. The first, last, and all files in-between will be highlighted.

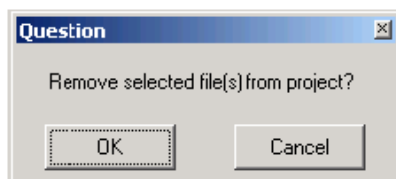
(iv) When done, press the Open button.

2. Removing files from a project

- a. To remove individual source files from a project, select the files to be removed, and then press the Remove File button. To remove all files from a project (i.e., to clear the file list), first press Select All, and then press the Remove File button.



- b. Press the OK button to confirm the removal operation:



The updated file list is displayed in the project window.

- c. Note that this operation has no effect on the actual file on-disk.

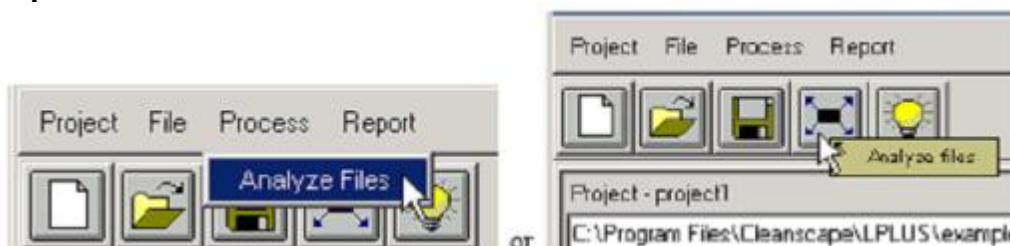
G. Execute test

1. Create a new project or open an existing project for testing.

To create a new project, see [Section 4.C](#).

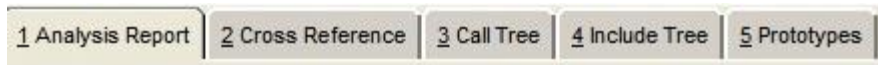
To open an existing project, [Section 4.D](#).

2. Select the files to be analyzed as explained in [Section 4.F.1](#).
3. Modify options as necessary, using the tabs in the lower left frame of the GUI, as displayed in [Sections 4.B.5-7](#). See balloon help, Online Help, and the [Lplus Reference Manual](#) (last bookmark in the Acrobat .pdf version of this file) for descriptions of each option.
4. To analyze the selected files, use Process/Analyze Files from the menu or press the Execute test button on the shortcut bar:



H. Review reports

1. To view the generated reports, click on the appropriate report tab:



2. To print reports, or to save them to disk, use the Report menu dropdown at the top of the screen. Reports may be printed or saved collectively or individually.
3. Samples of each of the five reports are depicted below. Remember that clicking any entry in **red** will open the source file at the appropriate source line in the External Editor specified on the [Reports tab](#).

```

1 Analysis Report | 2 Cross Reference | 3 Call Tree | 4 Include Tree | 5 Prototypes
-----
Function "acgrnd": unprototyped calls:
    file "C:\PROGRA~1\cleanscape\LPLUS\examples\train.c", line 326, 332, 905

Function "init_acgrnd_by_time": unprototyped calls:
    file "C:\PROGRA~1\cleanscape\LPLUS\examples\train.c", line 200

----- UNUSED FUNCTIONS -----
The following functions are defined but not used:

fexists          printData          printNet

----- LIBRARY FUNCTIONS -----
The following library functions are used:

atoi             atoi             ctime
exit             exp             fclose
fflush           fopen           fprintf
free             fscanf          malloc
printf           sleep           sprintf
sqrt             strcmp          strcpy
strlen           strncmp         system
time

----- UNUSED GLOBAL VARIABLES -----
The following global variables are defined but not used:

deltah1          deltah2          deltao
deltax           epoch_error      newAlgorithm
previousAlgorithm swp             whchange
wochange         wp              x
xyz

----- GLOBAL STATISTICS -----
Source  files processed:                2
Include files processed:                7

Source-file lines processed:            2,281
Source-file chars processed:            69,648
  
```

| 1 Analysis Report | 2 Cross Reference | 3 Call Tree | 4 Include Tree | 5 Prototypes |
|--------------------------------------|---|-------------|----------------|--------------|
| ----- FUNCTION CROSS-REFERENCE ----- | | | | |
| -D definition | -E external declaration | | | |
| -P prototype | -R function pointer | | | |
| float Dlogistic(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 144 | -P | |
| | 1329 1336 1341 1348 1419 | | -D | |
| float acgrnd(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 147 | -E | |
| | 326 332 905 1472 | | -D | |
| void addIfNew(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 133 | -P | |
| | 707 720 732 788 | | -D | |
| double atof(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 739 | | |
| | 740 741 760 | | | |
| int atoi(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 742 | | |
| | 744 746 747 748 | | | |
| void calcError(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 137 | -P | |
| | 401 477 501 513 1073 | | -D | |
| void calcOutput(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 139 | -P | |
| | 460 1113 1172 | | -D | |
| char *ctime(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 1503 | -E | |
| | 1506 | | | |
| char *date(); | | | | |
| | C:\PROGRA~1\cleanscape\LPLUS\examples\train.c | 150 | -P | |
| | 379 386 1500 | | -D | |

| 1 Analysis Report | 2 Cross Reference | 3 Call Tree | 4 Include Tree | 5 Prototypes |
|---|-------------------|-------------|----------------|--------------|
| ----- PRIMARY CALL TREE FOR "main" ----- | | | | |
| <pre> *name* - flags a recursive call (number) - labels a duplicate subtree (letter) - labels a continuation tree main--usage (1)--printf +-exit +-strncmp +-printf +-fopen +-fprintf +-fclose +-init_acgrnd_by_time--time +-initParse--fopen +-usage -- see (1) +-exit +-parseNext--fscanf +-strlen +-strncmp +-printf +-exit +-malloc +-strcpy +-addIfNew--printf +-fflush +-findFile (2)--strcmp +-exit +-strcpy +-nLinesWords--sprintf +-mysystem--printf +-fflush +-system +-sleep +-fopen +-fscanf +-fclose +-readPatterns--fopen +-printf +-exit +-malloc +-fscanf </pre> | | | | |

| | | | | |
|-------------------|-------------------|-------------|----------------|--------------|
| 1 Analysis Report | 2 Cross Reference | 3 Call Tree | 4 Include Tree | 5 Prototypes |
|-------------------|-------------------|-------------|----------------|--------------|

```

-- INCLUDE TREE FOR "C:\PROGRA~1\cleanscape\LPLUS\examples\train.c" --

*name*   - flags a recursive load
(number) - labels a duplicate subtree
(letter) - labels a continuation tree

train.c+-syslib.h
      +-test.h+-foo.h (1)--bar.h
      |      +-bar.h
      +-foo.h -- see (1)
  
```

| | | | | |
|-------------------|-------------------|-------------|----------------|--------------|
| 1 Analysis Report | 2 Cross Reference | 3 Call Tree | 4 Include Tree | 5 Prototypes |
|-------------------|-------------------|-------------|----------------|--------------|

```

----- GENERATED PROTOTYPES -----

float Dlogistic(float);

float acgrnd();

void addIfNew(char *);

void calcError(Set *,float *,float *,float *,float *,float *,float *,int);

void calcOutput(float *,float *,float *,float *);

char *date();

int fexists(char *);

int findFile(char *);

void initParse(char *);

void init_acgrnd_by_time();

void loadSet(Set *,char **,int,char *);

float logistic(float);

int main(int,char **);

int mysystem(char *);

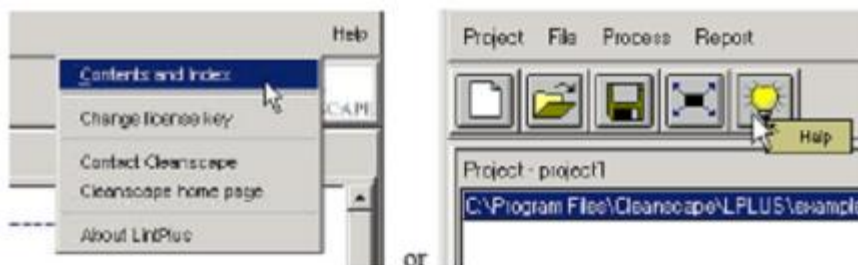
void nLinesWords(char *.int *.int *);
  
```

I. Online Help

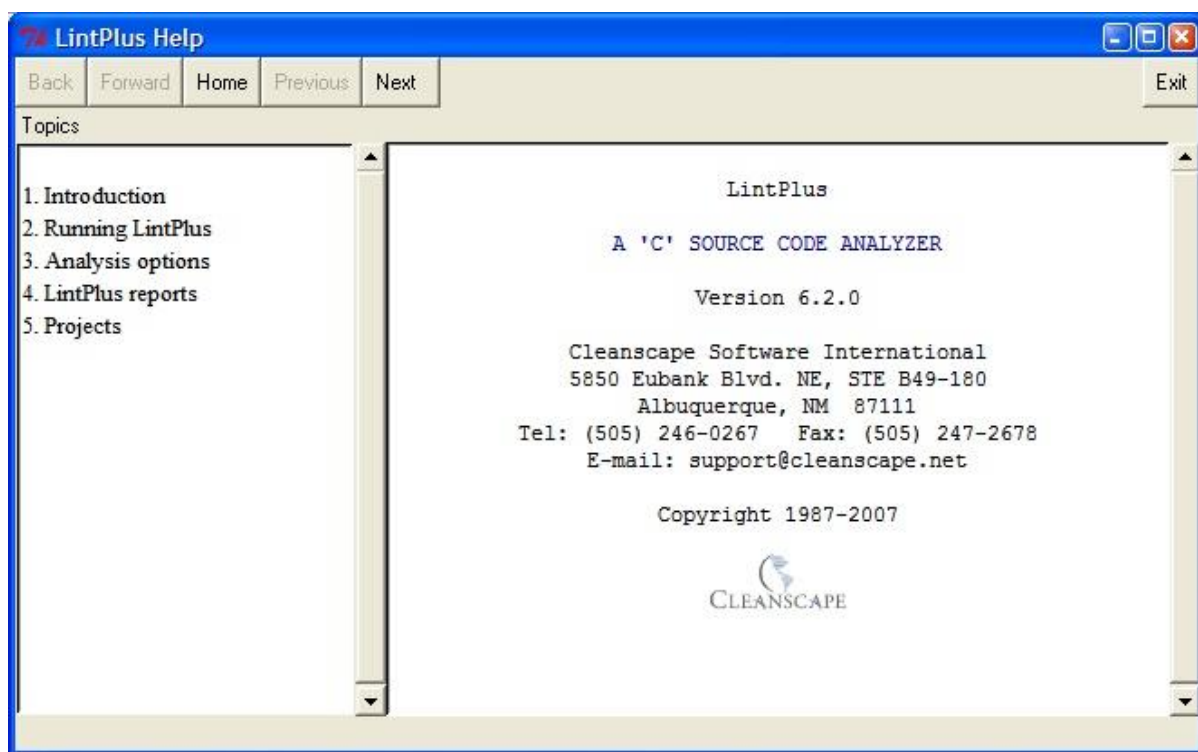
The Online Help System contains concise yet useful information for running the Cleanscape GUI. The Table of Contents and many interrelated items in the help text are hyperlinked to make information access quick and easy.

1. Accessing the Help System

- a. To access the online help system, select Help/Contents and Index from the menu or press the Help button:



- b. The Lplus Help browser will appear:

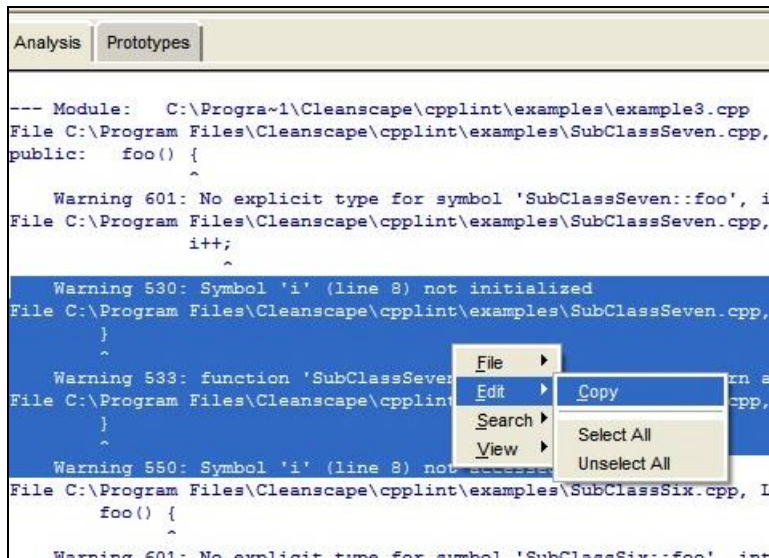


J. Sub-Menu Functions

There are several “right-mouse-click” options available while in the Reports frame on the right hand side of the GUI. These features should be self-explanatory for those familiar with graphical environments. The more commonly used features are shown in detail below.

1. Copy

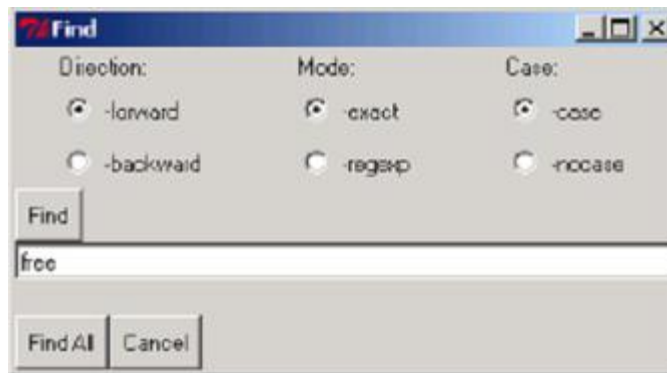
- a. Press the right mouse button inside reports frame
- b. Select Edit -> Copy



- c. The text can now be pasted into other applications (e.g., Microsoft Word).

2. Search

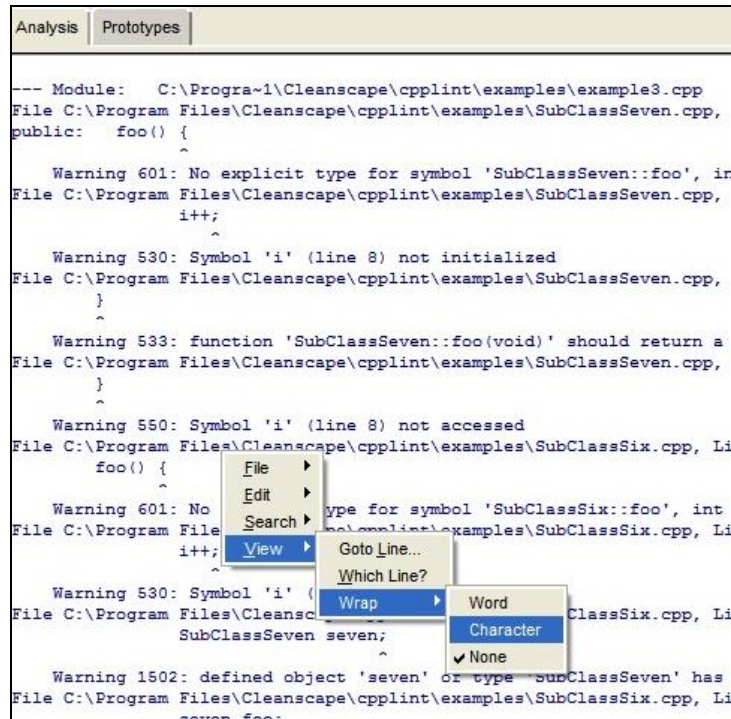
- a. Press the right mouse button inside a report frame.
- b. Select Search -> Find.
- c. Enter string to search and select the desired options:



- d. The search result(s) will be highlighted.

3. Line Wrap

- a. Press the right mouse button inside a report frame
- b. Select View -> Wrap. The default is None.



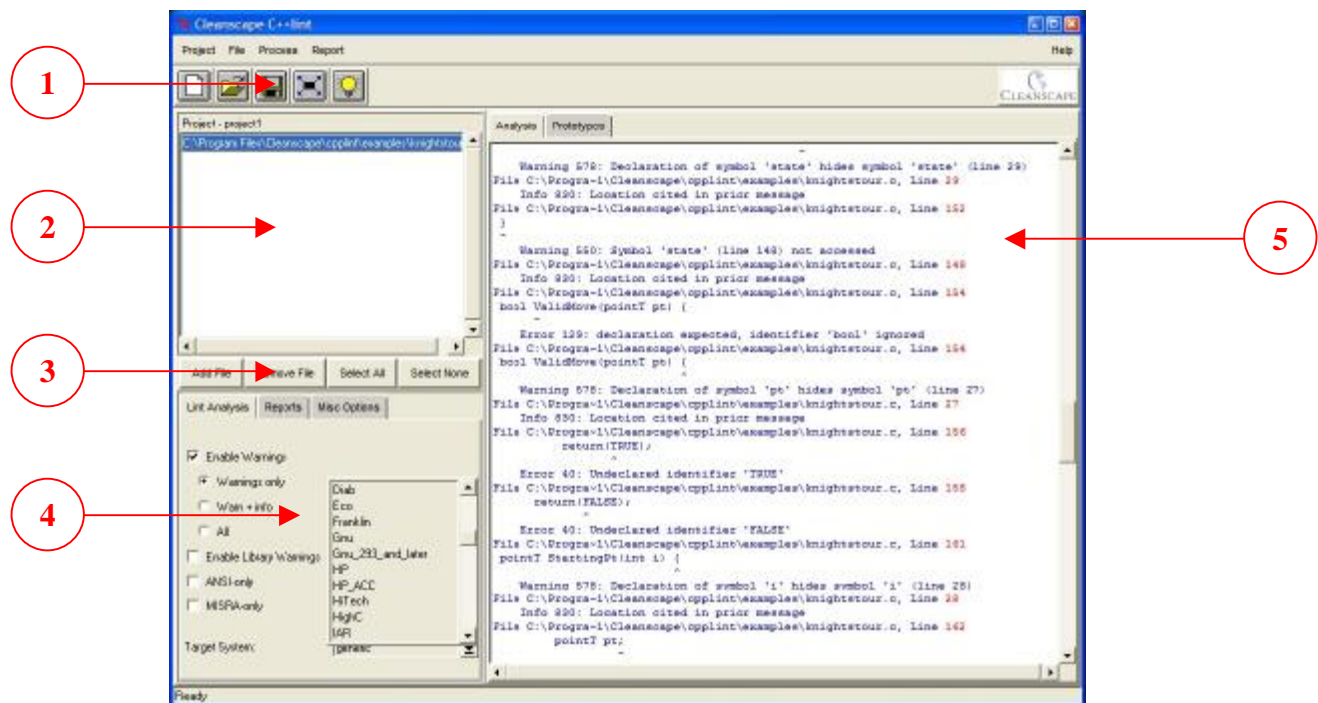
K. Operating the GUI using the Keyboard; Keyboard Shortcuts

All aspects of the Lplus GUI can be controlled from the keyboard. This capability was added to [comply](#) with the US Government's [Section 508](#) provisions.

1. Accessing dropdown menus and items using keyboard accelerators. This is the standard mode common to all Windows products.
 - a. Select the desired menu by holding down the <ALT> key, then pressing the underlined letter for that menu item. For instance, this screen image was obtained by pressing and holding <ALT>, then typing the "h" key:



- b. To open the GUI manual, release the <ALT> key and then press "g".
2. Navigating amongst screen elements. There are 5 screen elements in the GUI, as shown below:



- a. The <TAB> key scrolls between these five screen elements and all active items within each element. <SHIFT>+<TAB> reverses the scrolling. The item with focus will have a dotted line around its border. *Note:* Because

of the background color, the icon buttons in Element 1 will not show the dotted-line highlighting.

- b. For buttons (including radio buttons), pressing the space bar will “push” the button.
 - c. For checkboxes, pressing the space bar will “check/uncheck” the box.
 - d. For dropdown boxes, pressing the space bar will open the dropdown; the up/down arrows will navigate the dropdown, and the <ENTER> key will select.
3. Keyboard shortcuts.
- a. The standard Windows shortcuts are available. For instance, pressing <F1> will bring up the Help listing; <ALT>+<F4> exits the program.
 - b. Use the alt-key combination to access a menu, then type just the underlined letter to access a submenu item. For instance, to invoke Project-Save As, one would type <ALT>+<p>, then <a>. Alternately, the arrow keys can be used to navigate submenu selections once the menu dropdown has been activated with <ALT>+<p>.
 - c. The following keyboard shortcuts are also available within the GUI:

| | |
|-----------|--|
| <ALT>+<o> | <u>O</u> pen Project |
| <ALT>+<g> | Run the Analysis (<u>G</u> o) |
| <ALT>+<x> | <u>E</u> xit GUI |
| <ALT>+<l> | Jump to <u>L</u> int Options tab (in Element 4) |
| <ALT>+<r> | Jump to <u>R</u> eports tab (in Element 4) |
| <ALT>+<m> | Jump to <u>M</u> isc Options tab (in Element 4) |
| <ALT>+<1> | Jump to Report # <u>1</u> (Analysis report in Element 5) |
| <ALT>+<2> | Jump to Report # <u>2</u> (Xref report in Element 5) |
| <ALT>+<3> | Jump to Report # <u>3</u> (Call Tree report in Element 5) |
| <ALT>+<4> | Jump to Report # <u>4</u> (Include Tree report in Element 5) |
| <ALT>+<5> | Jump to Report # <u>5</u> (Prototypes report in Element 5) |

PART V Running Lplus from the Command Line

A. Introduction

Lplus has a command line facility suitable for standalone operation or for inclusion in scripts, e.g., for “make lint” purposes.

For details on the actual operation of Lplus and its control and reporting options, refer to the companion document, [Lplus Reference Manual](#) (last bookmark in the Acrobat .pdf version of this file).

B. Operation

To run Lplus in command line mode, you need to have set the environment variables as defined in [Section 2.1.B.1](#) or [Section 2.2.B](#) and registered the product as described in [Section 3](#).

The format of the Lplus command line is quite simple:

```
lplus <parameters_to_be_supplied_to_Lplus> <source_filename(s)>
```

Entering `lplus` without parameters yields a command summary.

Details on all the command line parameters may be found in Chapter 5 of the [Lplus Reference Manual](#) (last bookmark in the Acrobat .pdf version of this file).

Other important sections in the Lplus reference manual include report format/content sub-options (Chapter 6), using magic comments (Chapter 8), and the Unix install guide (Appendix A), which also provides details on the license daemon (not used under Windows).

C. Return Codes

- A return code >1 indicates that there was a problem securing a valid license key to run the program, or

A detailed description is of course available in the analysis report. If there was a problem starting the program or securing a key, contact support@cleanscape.net. If you are under maintenance, you may also contact Cleanscape Support for questions regarding any analysis output message.

PART VI MISCELLANEOUS INFORMATION

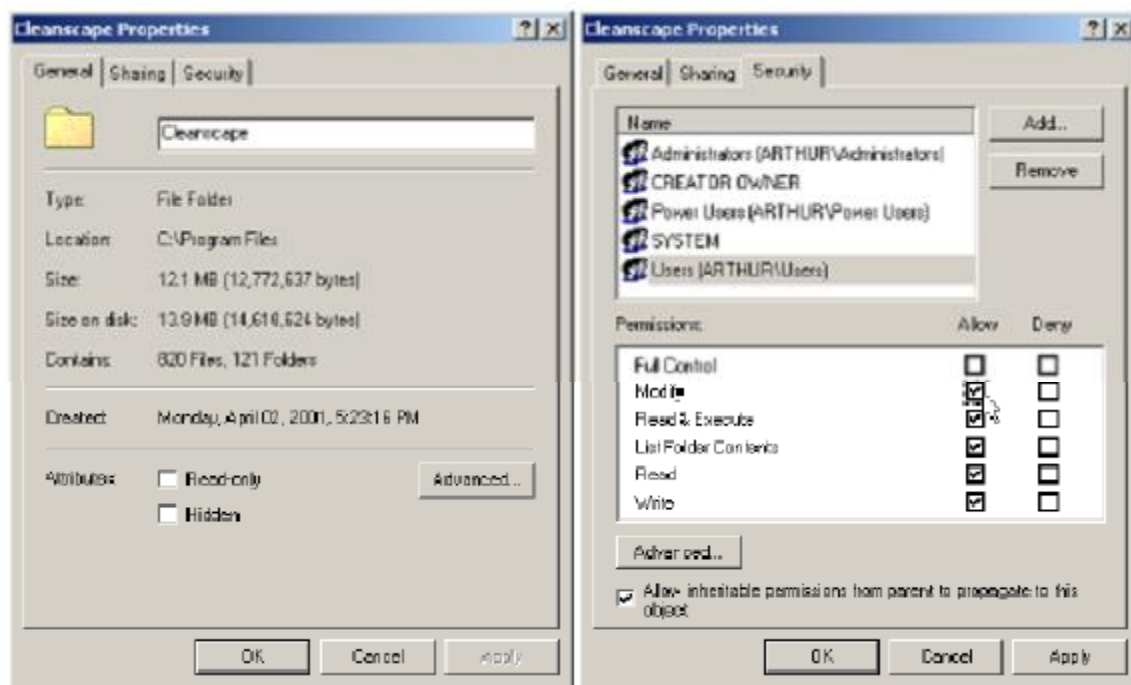
6.1 ADDITIONAL STEPS FOR WINDOWS 2000

A. Important note

1. This section applies to users running Windows 2000 who belong to the “Users” group, and only to that group.

B. Details

1. For Lplus to run correctly under Windows 2000, users must have “write” and “modify” access rights to the directory “C:\Program Files\Cleanscape” and all sub-directories under it. This document explains the procedure used to change the access rights described above.
 - a. Log in as “administrator” and finish installing Lplus.
 - b. Double-click on the “My Computer” icon on the desktop.
 - c. Double-click on the “Program Files” folder, then right-click the “Cleanscape” folder. Select Properties from the sub-menu.
 - d. Select “Security” tab on the Cleanscape Properties screen:



- e. Select the “Users” group and enable the “Modify” and “Write” permission.
- f. Click the “Apply” button.
- g. Click the “OK” button. This should close the Cleanscape Properties window.
- h. Lplus is now ready to run on Windows 2000 for the “Users” group.

6.2 ADDING AN EXTERNAL EDITOR TO THE GUI USING SETEDITOR

A. Introduction

By popular demand, Cleanscape has added the ability for users to add their own favorite editor to any Cleanscape GUI (as opposed to submitting a feature request to Cleanscape Support). This is implemented via an external program called `seteditor`, located in the 'bin' subdirectory.

User contributions welcome! Send them to support@cleanscape.net; any contributions will receive appropriate credit and be placed in a "master" file located at http://www.cleanscape.net/products/contributed_editors.html

B. Operation

Windows.

You can either run `seteditor` from the command line or via Explorer.

From a DOS shell (cmd or command prompt), run the following command:

```
"%PROGRAMFILES%\cleanscape\lplus\bin\seteditor"
```

From Explorer, navigate to the above directory and then double-click

`seteditor.exe`.

Unix.

From a shell prompt, run the following command:

```
/usr/local/cleanscape/bin/seteditor
```

Three pop-up dialogs (Windows) or a sequence of shell interactions (Unix/Linux) will guide you through

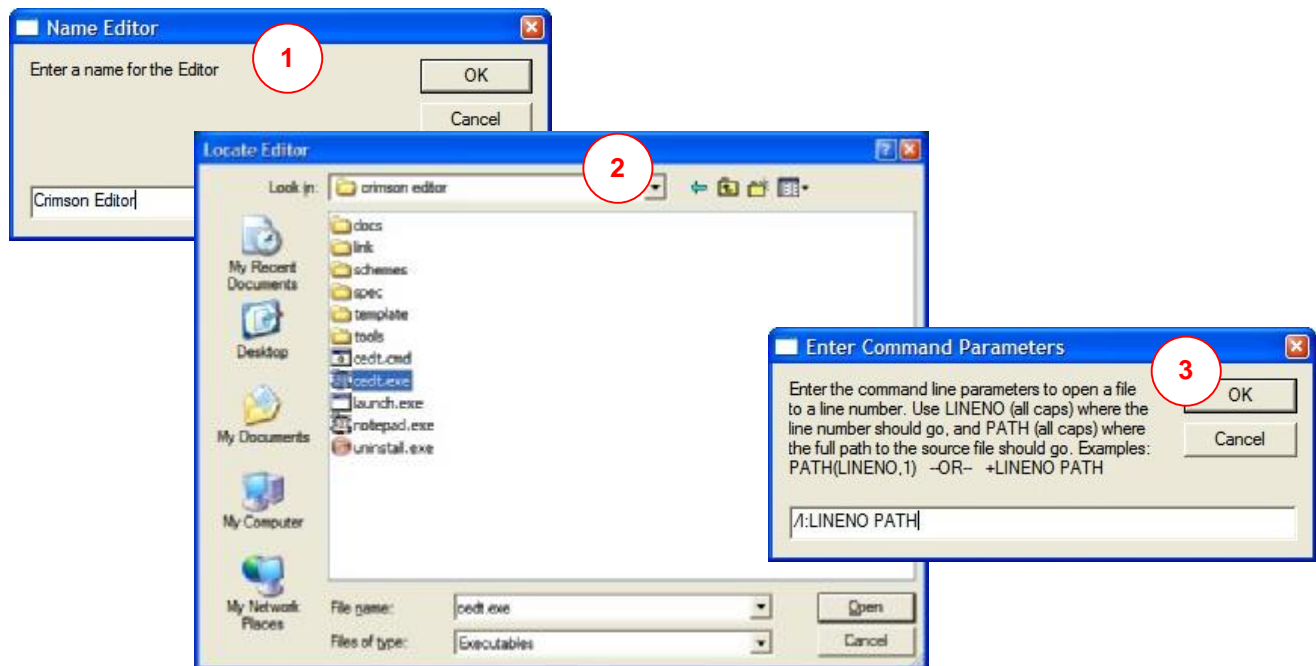
1. Naming the editor for the Editor dropdown in the Cleanscape GUI
2. Locating the editor executable itself
3. Setting command line parameters to open a file and jump to a line number.

A sample Windows session depicting the dialogs for all three steps (and labeled as such) is shown on the next page.

NOTE: Refer to your editor's documentation to get the editor's command line information required (i.e., specifying the filename to open and the line number to jump to when opening the file). If your editor does not support jumping to line numbers from the command line, you can still invoke the editor but it will be impossible to align the analysis message to the "offending" source line.

Any number of editors may be added in this fashion. Added file information is stored in file `myeditors.lst`, located in `%PROGRAMFILES%\cleanscape\lplus\bin` on Windows or your home directory if running Unix/Linux. Once successfully added, email your `myeditors.lst` file to support@cleanscape.net for inclusion in a Master file to share with other Cleanscape customers!

Finally, it is possible to edit the `myeditors.lst` file manually. See the comments inside the template version of the file in the 'bin' subdirectory, or in your home directory for Unix/Linux. A Unix/Linux session is shown below, as are the contents of `myeditor.lst` (which looks substantially similar under Windows).



```
suse:/home/chris
suse:~$ /usr/local/cleanscape/bin/seteditor

This program adds an external editor to the Cleanscape GUI(s).
You will need to supply the command line switches for loading a file and
jumping to a line number. Enter 'quit' to consult the editor documentation
first if necessary, or <Enter> to proceed:

Use CTRL-C to exit at any of the following prompts.
Enter a name for the Editor: Kwrite
Enter the path for the Editor (default /usr/bin): /opt/kde3/bin
Enter the filename for the Editor (default kwrite):
Is this a text-based editor intended to run inside a console window? (y/n): n

Enter the command line parameters to open a file to a line number.
Use LINENO (all caps) where the line number should go, and
PATH (all caps) where the full path to the source file should go.
Examples: PATH(LINENO,1) --OR-- +LINENO PATH
Parameters (default +LINENO PATH): --line LINENO PATH
Kwrite has been added to the list for Cleanscape GUI(s).
suse:~$ cat myeditor.lst
# This file holds information required to add an editor to the Cleanscape GUI.
# A line with '#' in column one is a comment.

# Program "seteditor" interactively adds a file, or edit this file using the
# template/example below (sans '#' in column one). "path_line" in the template
# represents your editor's command line parameters for specifying
# 1) the source file's fully qualified pathname (denoted as PATH) and
# 2) how to jump to a specified line when opening a file (denoted as LINENO).

# Note that PATH and LINENO must be in all caps, the executable starts with
# '/'; and the editor path does NOT have a trailing '/'.

# "text_based" in the template is either a Y or a N and indicates whether the
# editor is text-based and intended to run inside a console window. This
# field is ignored (but must still be present) for windows.

# TEMPLATE:
# editor-label__editor-filename__editor-path__text-based__path-line

# EXAMPLE:
# Joe__/joe__usr/bin__Y__+LINENO PATH

Kwrite__kwrite__opt/kde3/bin__N__--line LINENO PATH
suse:~$
```