

# Cleanscape LintPlus for Windows®

## Quick Start Guide

Rev: 5.6.03

Cleanscape Software International

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## PART I INTRODUCTION

### .1 DOCUMENTATION

#### A. About LintPlus Quick Start Guide

1. This is the “quick start” guide for the LintPlus graphical user interface. For the main manual, see the file **lplusman.pdf** stored in the **doc** subdirectory.

### .2 PURPOSE

#### A. Functions

1. Cleanscape LintPlus is a programming tool that simplifies the debugging and maintenance of both large and small 'C' programs.
2. Cleanscape LintPlus includes a source code analyzer that can detect a wide range of 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. Applications

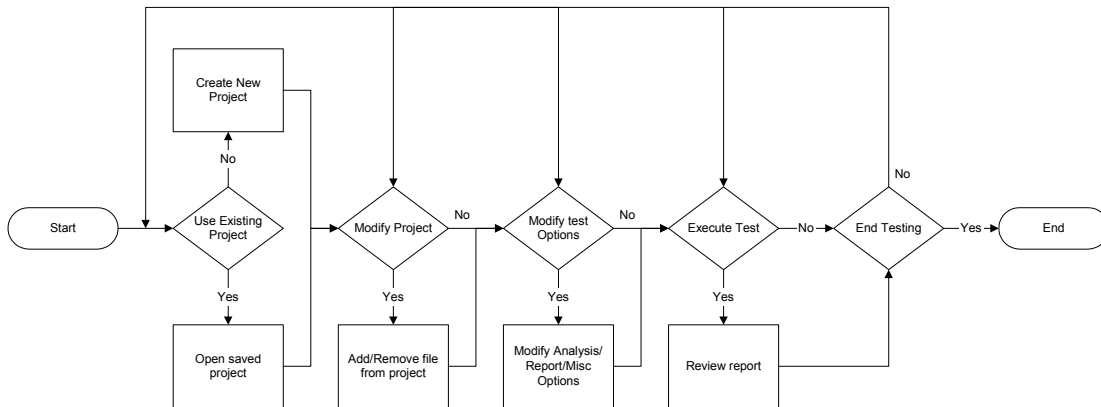
1. Cleanscape LintPlus can be used to:
  - a. Check source files before they are compiled
  - b. Isolate obscure problems
  - c. Identify problems before debugging is required
  - d. Map out unfamiliar programs
  - e. Enforce programming standards

#### C. Advantages

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

## D. Flow of Analysis

1. The following flowchart illustrates the LintPlus for Windows test process:



## PART II SETUP AND ACTIVATION

### .1 WINDOWS

#### A. System Requirements

##### 1. Hardware

- Minimum 30MB of free hard disk space
- Minimum 128MB of RAM
- Mouse

##### 2. Software

###### a. Operating Systems

- [Microsoft Windows 98®](#) and [98® SE](#)
- [Microsoft Windows NT® 4.0](#) with [Service Pack 6a \(SP6a\)](#)
- [Microsoft Windows 2000®](#) with [Service Pack 2 \(SP2\)](#)
- Linux
- [Sun Solaris®](#)
- Other UNIX platforms

###### b. Web Browsers

- [Microsoft Internet Explorer®](#) 5.x or above
- [Netscape Navigator®](#) 4.7x or above
- [Opera](#) 6.x or above

#### B. Software Setup Procedure

##### 1. Installation

###### a. To install the package, proceed as follows:

- Copy **lpluswin.exe** to a temporary directory, then run the program.
- An installer window should appear. Click the *Install* button. This should extract a number of files. After all files are extracted, click *Exit*.

- 3) LintPlus is now installed. The installer creates a shortcut on the desktop automatically. To run LintPlus, double-click the shortcut.

Note: A system reboot is not required.

- 4) If you'd like to use the command-line version of LintPlus, two additional steps are required:
  - (i) Set the environment variable IPTLINT as follows:

```
SET CSIHOM=C:\PROGRA~1\CLEANSCAPE\LPLUS\MAIN
```

- (ii) Modify PATH as follows:

```
PATH %CSIHOM%;%PATH%
```

Note: Under Windows 98, you may need to add double quotes as follows:

```
PATH "%CSIHOM%;%PATH%"
```

2. Additional steps for Windows 2000

If you're going to install LintPlus 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 [Part V.1](#)

3. Un-installation

- a. To "uninstall" the MS-Windows LintPlus package:

- 1) Delete the following directory (including subdirectories):

```
C:\Program Files\Cleanscape\LPLUS
```

- 2) Remove the LintPLUS shortcut from the desktop

## 2 UNIX

### A. Software Setup Procedure

1. Installation

- a. At this point, you should already have a LintPlus "tarball". The tarball will have a name similar to:

```
csilint_SYSTEM.tar.Z    or  
csilint_SYSTEM.tar.gz
```

For example:

```
Standard Linux    - csilint_linux.tar.gz  
libc5-based Linux - csilint_libc5.tar.gz  
Sun Solaris       - csilint_solaris.tar.Z  
HPUX              - csilint_hpux.tar.Z  
etc.
```

Note: The Standard Linux version is intended for recent versions of Linux; use kernel 2.4.15 or above. For versions of Linux that are more than two years old, use the libc5-based version.

2. Copy the tarball to the **/tmp** directory on the target system.

3. Create a directory for Cleanscape applications. For example:

```
Under Linux or HPUX:  mkdir -p /usr/local/cleanscape  
Under Solaris:       mkdir -p /opt/cleanscape  
etc.
```

Note: If you're going to create a system directory, you'll need to log-in as **root**. Otherwise, any user account may be used.

4. Go to the new Cleanscape directory.

5. Unpack the tarball inside the new directory.

If the tarball's name ends with .tar.gz (or .tgz), use a command similar to the following:

```
gzip -c -d < /tmp/foo.tar.gz | tar xf -
```

If the name ends with ".tar.Z" (or ".taz"), use a command like this:

```
compress -c -d < /tmp/foo.tar.Z | tar xf -
```

Note: Under Linux, you can use a simple command of the following form to unpack either kind of tarball:

```
tar xzf /tmp/foo.tar.gz
```

6. Set up the required environment variables.

Edit your UNIX "login" scripts (and the "login" scripts for any other users who will be running LintPlus). Add commands similar to the following:

- a. For "sh" or "bash" users:

```
CSIDIR=/usr/local/cleanscape  
CSIHOME=$CSIDIR/lplusgui.dir/main  
CSIHOST=localhost  
export CSIHOME  
export CSIHOST  
PATH=$CSIDIR:$CSIHOME:$PATH
```

- b. For "csh" or "tcsh" users:

```
setenv CSIDIR /usr/local/cleanscape  
setenv CSIHOME $CSIDIR/lplusgui.dir/main  
setenv CSIHOST localhost  
set path = ( $CSIDIR $CSIHOME $path )  
rehash
```

Note: "CSIDIR" should specify the new Cleanscape directory created in step 3. Modify the setting shown here as necessary.

- c. After adding the appropriate commands, log out, then log-in again.
- d. If you only plan to run the GUI version of LintPlus, and you don't intend to use the command-line version, you don't need to set CSIHOME or CSIHOST. In this case, the following setup commands should be sufficient:

- 1) For "sh" or "bash" users:

```
CSIDIR=/usr/local/leanscape  
PATH=$CSIDIR:$PATH
```

- 2) For "csh" or "tcsh" users:

```
setenv CSIDIR /usr/local/leanscape  
set path = ( $CSIDIR $path )  
rehash
```

Note: "CSIDIR" should specify the new Cleanscape directory created in step 3. Modify the setting shown here as necessary.

7. You should now be able to run LintPlus in GUI mode. To do so, execute the command **lplusgui**.

After you "activate" the GUI (see the next section), you will also be able to run the command-line version of LintPlus. To do so, execute the command **lplus**.

### **PART III          ACTIVATING LintPlus**

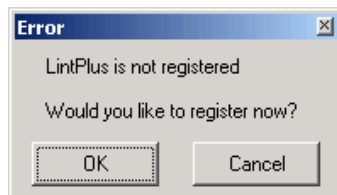
#### **.1    ACTIVATION PROCEDURE**

##### **A.    Registration Process**

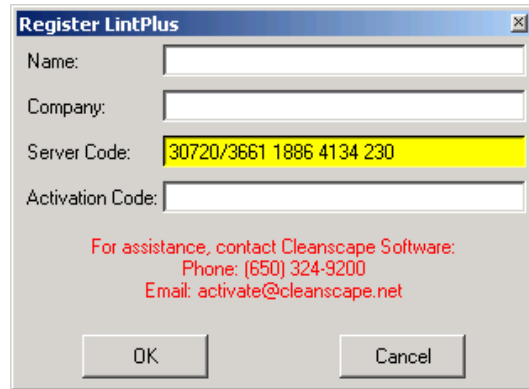
The first time that you run the program, a registration prompt will be displayed. You must "register" the program before you can use them. This is a one-time process.

##### **B.    LintPlus Activation Procedure**

1. If LintPlus is not registered, a dialog box will be displayed. To continue, press *OK*:



2. LintPlus registration window



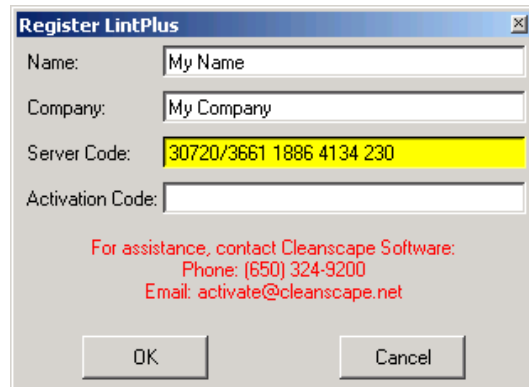
The 'Register LintPlus' dialog box contains the following fields and text:

- Name:
- Company:
- Server Code:  (highlighted in yellow)
- Activation Code:
- For assistance, contact Cleanscape Software:  
Phone: (650) 324-9200  
Email: [activate@cleanscape.net](mailto:activate@cleanscape.net)
- Buttons: OK, Cancel

To obtain your activation code, 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:

To reach Cleanscape, call (650) 324-9200 or send email to [activate@cleanscape.net](mailto:activate@cleanscape.net)

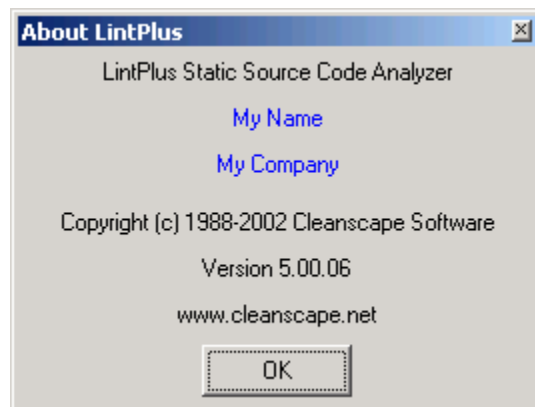
3. Enter your name, company name and the activation code. When ready, press *OK*:



The 'Register LintPlus' dialog box now shows the following information entered:

- Name:
- Company:
- Server Code:  (highlighted in yellow)
- Activation Code:
- For assistance, contact Cleanscape Software:  
Phone: (650) 324-9200  
Email: [activate@cleanscape.net](mailto:activate@cleanscape.net)
- Buttons: OK, Cancel

4. Confirm your registration information. When ready, press *OK*:



The 'About LintPlus' dialog box displays the following information:

- LintPlus Static Source Code Analyzer
- My Name
- My Company
- Copyright (c) 1988-2002 Cleanscape Software
- Version 5.00.06
- [www.cleanscape.net](http://www.cleanscape.net)
- Button: OK

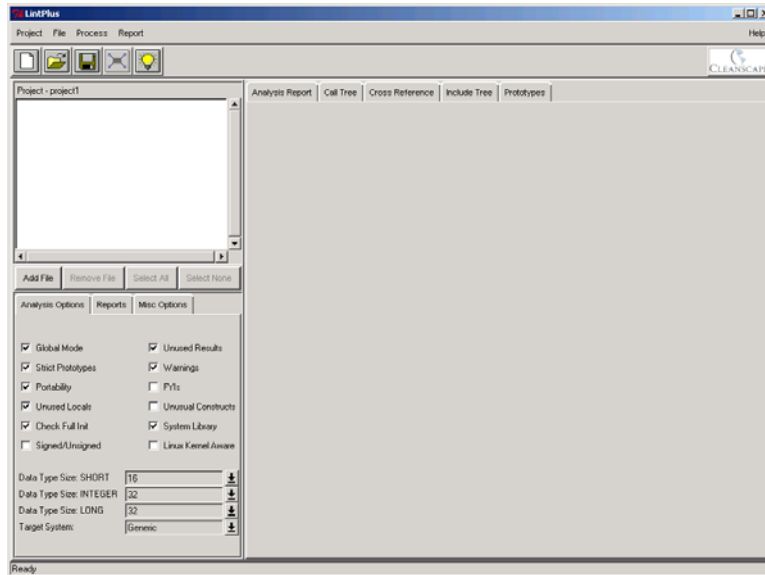
5. LintPlus is now registered and operational.



## PART IV      RUNNING LintPlus

### .1 USER INTERFACE

#### A. Overview



#### B. Components

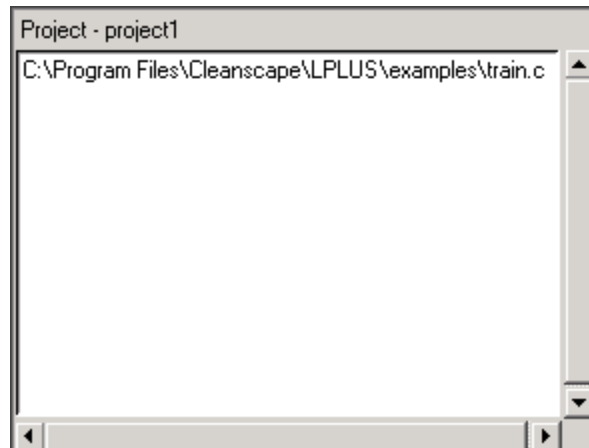
##### 1. Program menu:



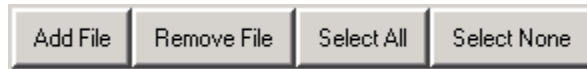
##### 2. Shortcut bar:



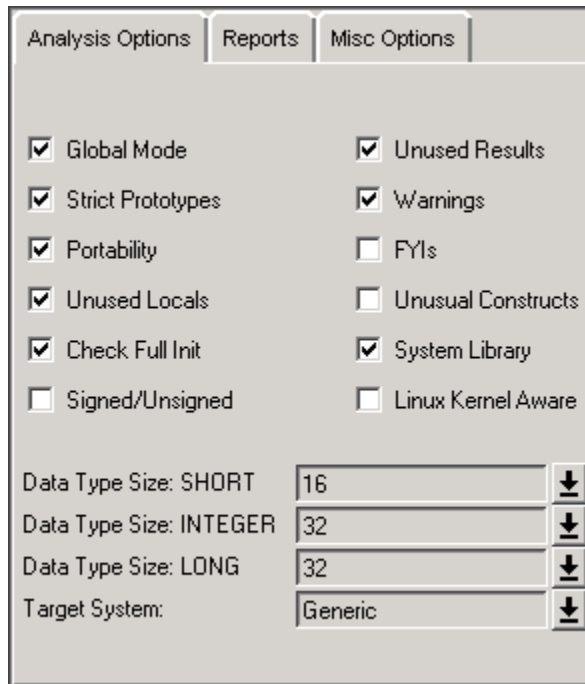
##### 3. Project window:




4. Project shortcut buttons:



5. Analysis Options window:



6. Report Options window:

Analysis Options	Reports	Misc Options
<input checked="" type="checkbox"/> Call Tree	<input checked="" type="checkbox"/> Verbose Messages	
<input checked="" type="checkbox"/> Clip Tree	<input checked="" type="checkbox"/> Make Prototypes	
<input type="checkbox"/> Squash Tree	<input checked="" type="checkbox"/> Cross-Reference	
<input checked="" type="checkbox"/> Trim Tree	<input type="checkbox"/> Source Listing	
<input checked="" type="checkbox"/> Include Tree	<input type="checkbox"/> List Includes	
<input checked="" type="checkbox"/> Clip Tree	<input checked="" type="checkbox"/> Statistics	
<input checked="" type="checkbox"/> Squash Tree	<input checked="" type="checkbox"/> Add Separators	
<input checked="" type="checkbox"/> Trim Tree	<input checked="" type="checkbox"/> Auto-save reports	
<input type="checkbox"/> Show paths	<input checked="" type="checkbox"/> Auto-load reports	
<input checked="" type="checkbox"/> Standard includes	Color: <input type="text" value="Blue"/> 	
<input type="checkbox"/> Single tree		

7. Miscellaneous Options window:

Analysis Options	Reports	Misc Options
Define symbols:		
<input type="text"/>		
Undefine symbols:		
<input type="text"/>		
Disable specific messages:		
<input type="text"/>		
Enable specific messages:		
<input type="text"/>		
"Standard include" directories:	<input type="button" value="Browse..."/>	
<input type="text"/>		
"Local include" directories:	<input type="button" value="Browse..."/>	
<input type="text"/>		

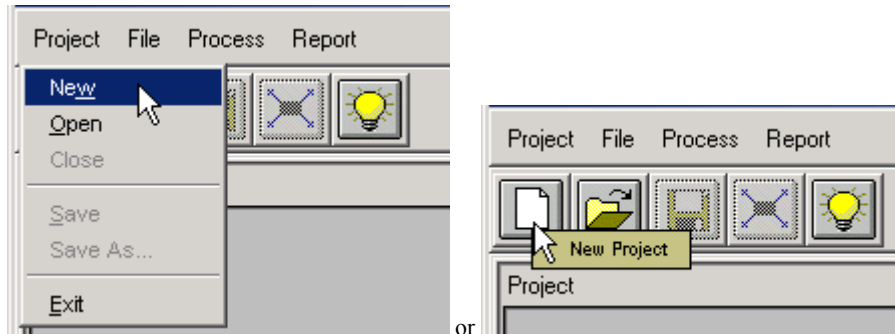
8. Report windows:

Analysis Report	Call Tree	Cross Reference	Include Tree	Prototypes

### 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.

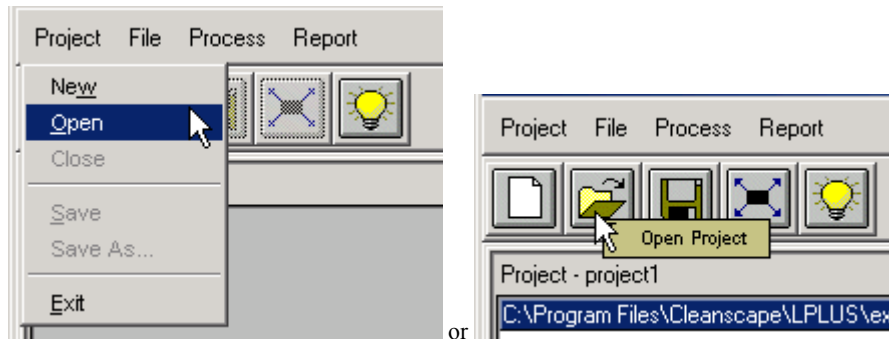


2. A new project name appears in the title:

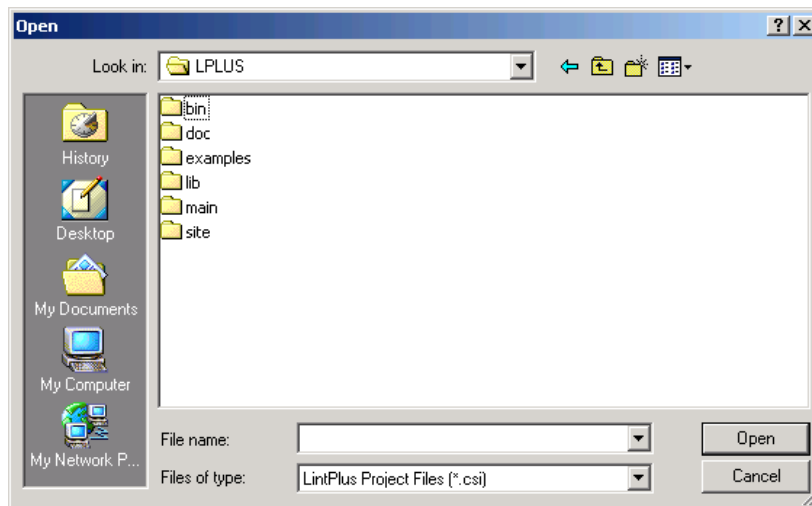
Project - project1

D. Opening an existing project

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



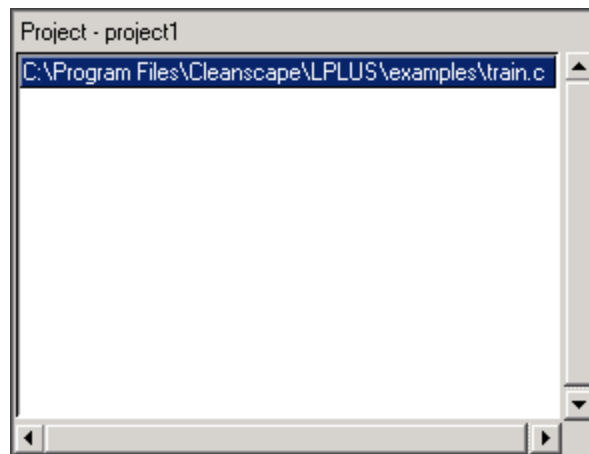
2. The **Open** window will appear:



- a. Select a project file (*filename.csi*) from the browse window.
- b. When ready, press *Open*:

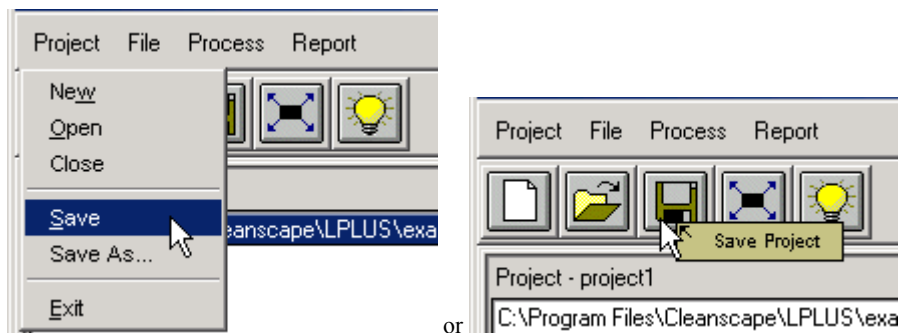


- Files associated with the project are displayed in the file listing window:

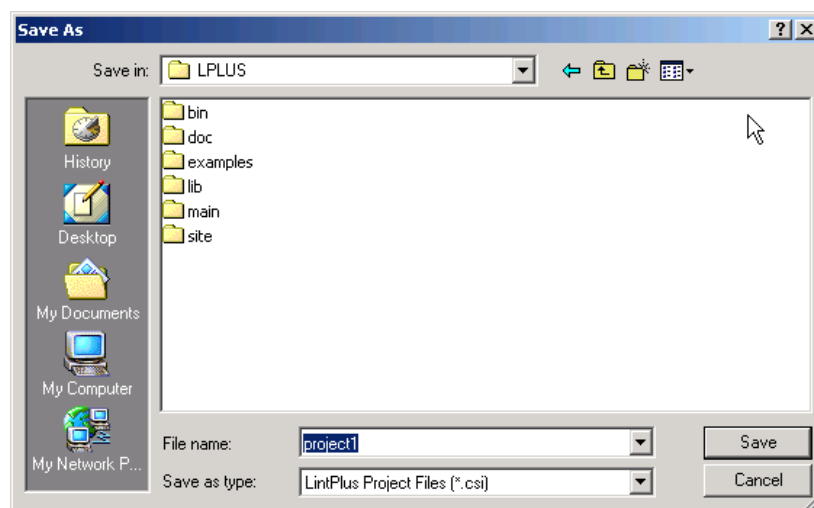


#### E. Saving project

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



- If this is a new project, the **Save As** window will appear.



- a. Enter a name for the project.



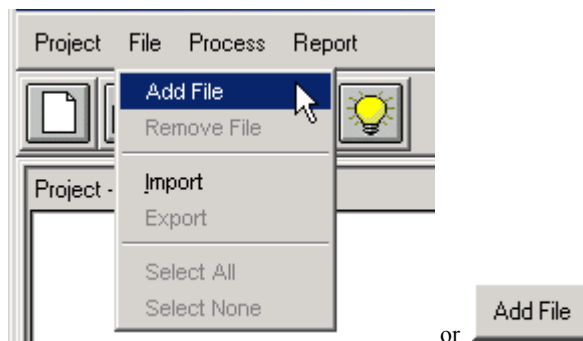
- b. When done, press the *Save* button:



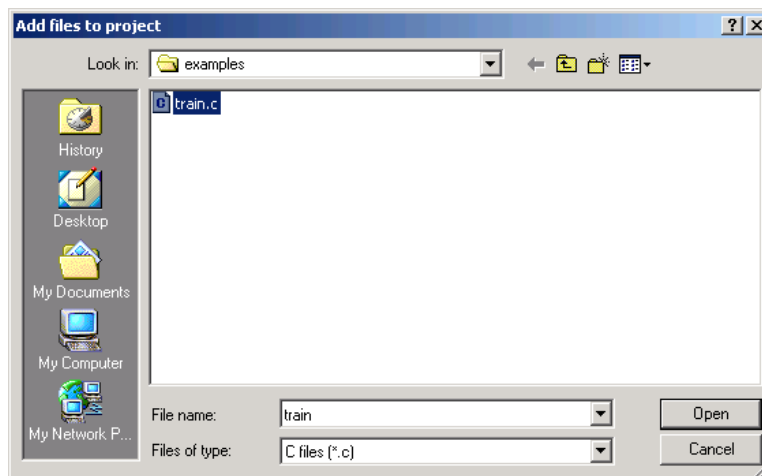
## F. Modifying project

### 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:

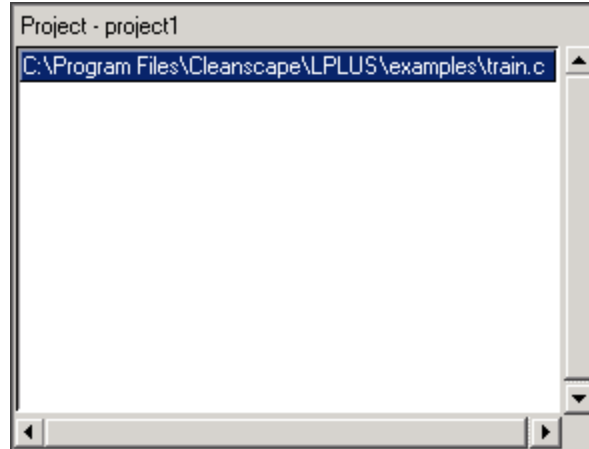


- c. To add 'C' source files to a project, use *Add File* on the *File* menu, or press the *Add File* button.
  - 1) The file-selection dialog supports multiple-file selection under both MS-Windows and UNIX.
  - 2) To add multiple files individually: use <Control> + Left Mouse Button.

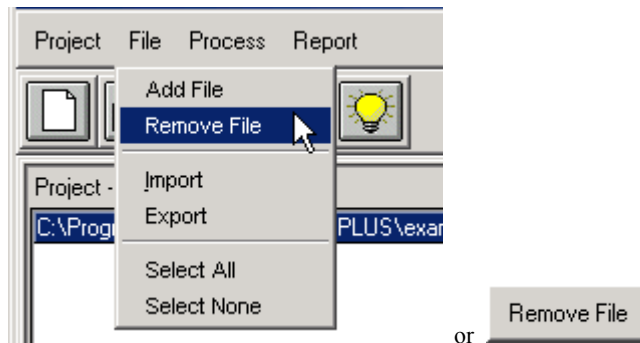
- 3) To add a group of files:
  - (i) Left-click on the first file
  - (ii) Hold down <Shift> + Left Mouse Button
  - (iii) Drag the mouse.

4) When done, press the *Save* button: 

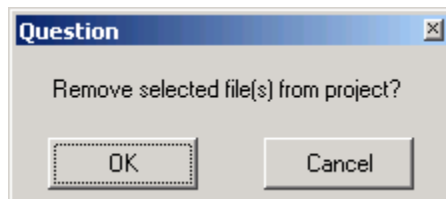
## 2. Removing files from a project



- a. To remove individual source files from a project, select the files to be removed (as explained in the preceding section), and then press the *Remove File* button:
- b. To remove all files from a project (i.e., to clear the file list), press *Select All*, and then press the *Remove File* button:

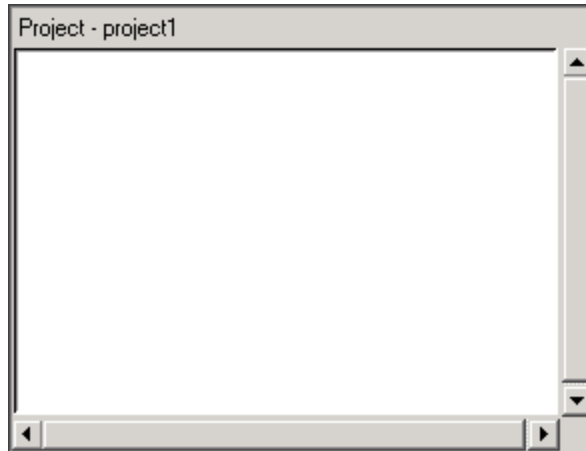


- c. Press the *OK* button to confirm the removal operation:





- d. Updated file list is displayed in the project window:



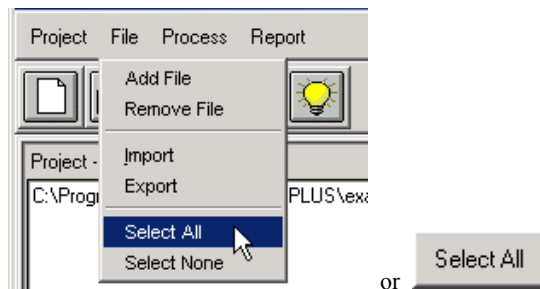
G. Execute test

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

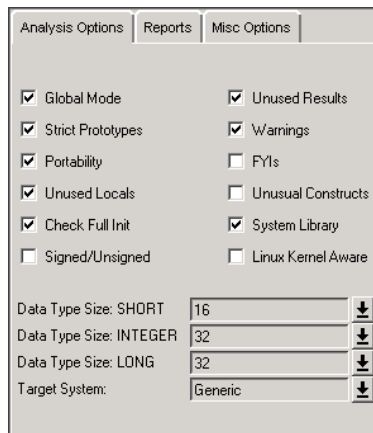
To create a new project, see [section III.2.B.](#)

To open an existing project, [section III.2.C.](#)

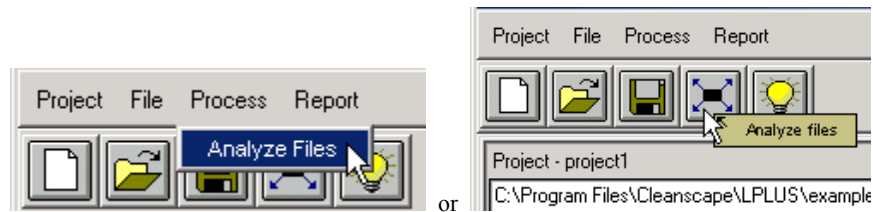
2. Select the files to be analyzed as explained in [Section IV.F.1:](#)



3. Modify options as necessary:

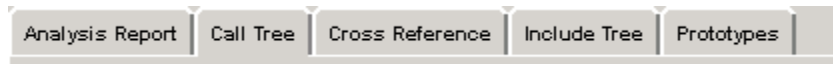


4. To analyze the selected files, use *Process/Analyze Files* from the menu or press the *Execute test* button on the shortcut bar:

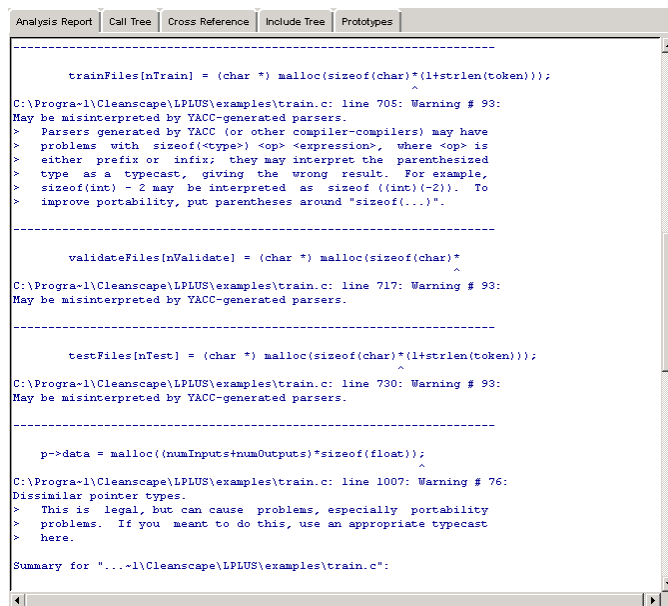


#### H. Review reports

- a. To view the generated reports, use the report tabs:



- b. To print reports, or to save them to disk, use the *Report* menu at the top of the screen. Reports may be printed or saved collectively or individually.
- c. Sample Analysis Report:



d. Sample Call Tree report:

Analysis Report | Call Tree | Cross Reference | Include Tree | Prototypes

----- PRIMARY CALL TREE FOR "main" -----

\*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

e. Sample Cross Reference report:

Analysis Report	Call Tree	Cross Reference	Include Tree	Prototypes
double atof();	...a-1\Cleanscape\LPLUS\examples\train.c	739	740	
	741	760		
int atoi();	...a-1\Cleanscape\LPLUS\examples\train.c	742	744	
	746	747	748	
void calcError();	...a-1\Cleanscape\LPLUS\examples\train.c	137-P	401	
	477	501	513	1073-D
void calcOutput();	...a-1\Cleanscape\LPLUS\examples\train.c	139-P	460	
	1113	1172-D		
char *ctime();	...a-1\Cleanscape\LPLUS\examples\train.c	1503-E	1506	
char *date();	...a-1\Cleanscape\LPLUS\examples\train.c	150-P	379	
	386	1500-D		
void exit();	...a-1\Cleanscape\LPLUS\examples\train.c	175	188	
	442	683	703	709
	734	739	740	741
	747	748	749	760
	1000	1018	1489	766
				797
				807
double exp();	...a-1\Cleanscape\LPLUS\examples\train.c	1414		
int fclose();	...a-1\Cleanscape\LPLUS\examples\train.c	197	380	
	1036	1435	1535	
int fexists();	...a-1\Cleanscape\LPLUS\examples\train.c	128-P	1529-D	

f. Sample Include Tree report:

```
*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)
```

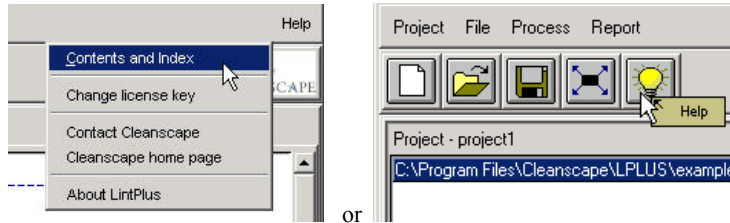
g. Sample generated Prototypes report:

```
float Dlogistic(float);
float acgrnd();
void addIfNew(char *);
void calcError(struct set_struct *,float *,float *,float *,float *,float *,float *,int);
void calcOutput(float *,float *,float *,float *);
char *date();
int feexists(char *);
int findFile(char *);
void initParse(char *);
void init_acgrnd_by_time();
void loadSet(struct set_struct *,char **,int,char *);
float logistic(float);
int main(int,char **);
int mysystem(char *);
void nLinesWords(char *,int *,int *);
int parseNext();
int printData(char *,struct pattern_struct *);
void printMet(int,int,int,int,float *,float *,float *,float *,float *,float *,float *);
void readPatterns(struct file_struct *);
void trainHammer();
```

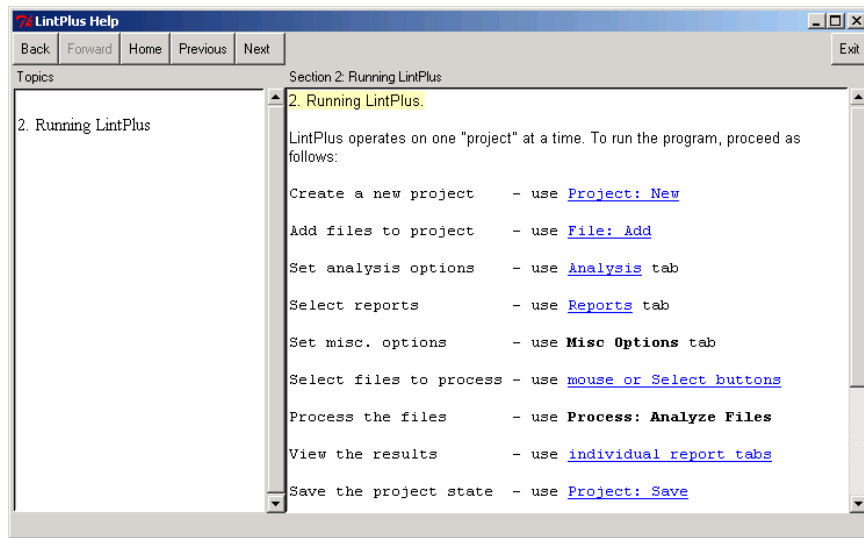
## I. Online Help

### 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:



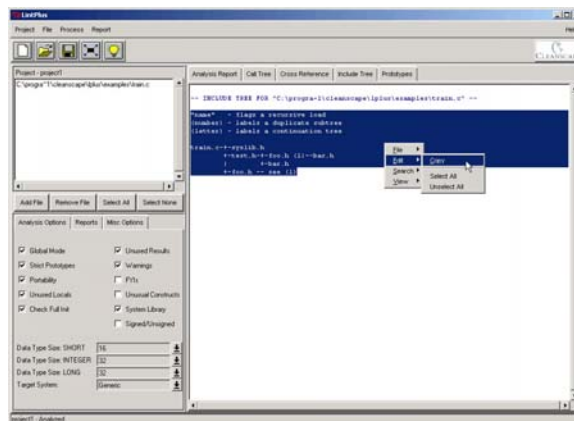
- b. The **LintPlus Help** browser will appear:



## J. Sub-Menu Functions

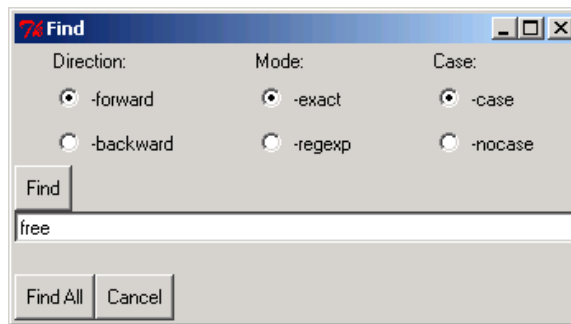
### 1. Copy (Microsoft Windows Only)

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

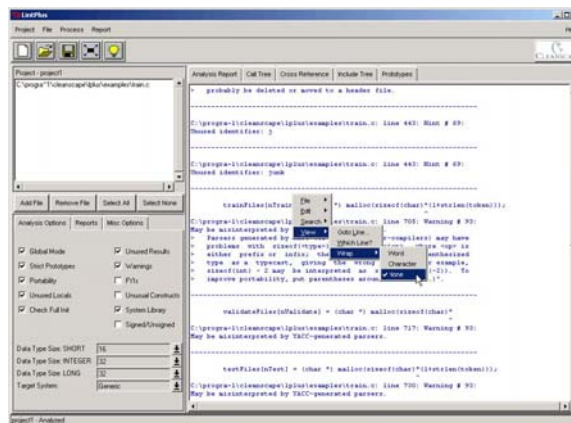




- c. Enter string to search and select the desired options



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



## PART V MISCELLANEOUS INFORMATION

### .1 ADDITIONAL STEPS FOR WINDOWS 2000

#### A. Important notes

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

#### B. Details

1. For LintPlus 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.

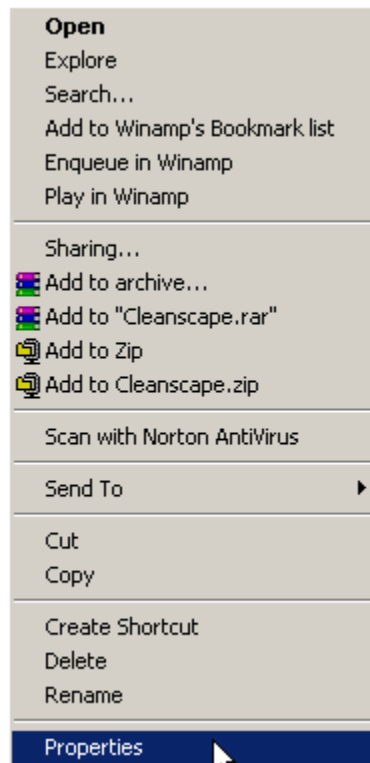
- a. Log in as 'administrator' and finish installing LintPlus for Windows



- b. Double-click on the 'My Computer' icon on the desktop

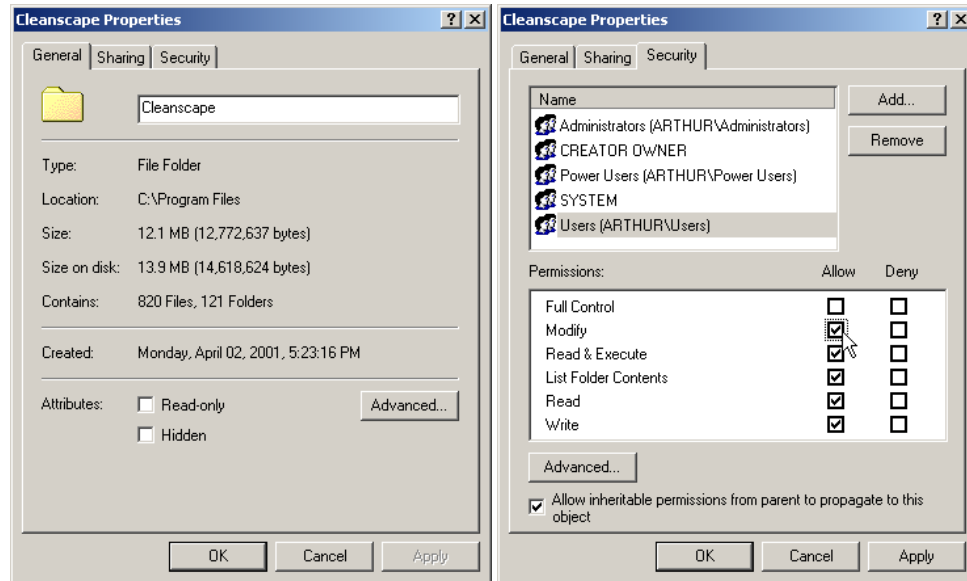


- c. Right-click on the 'Cleanscape' folder and select Properties from the sub-menu.





- 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. LintPlus is now ready to run on Windows 2000 for the 'Users' group.