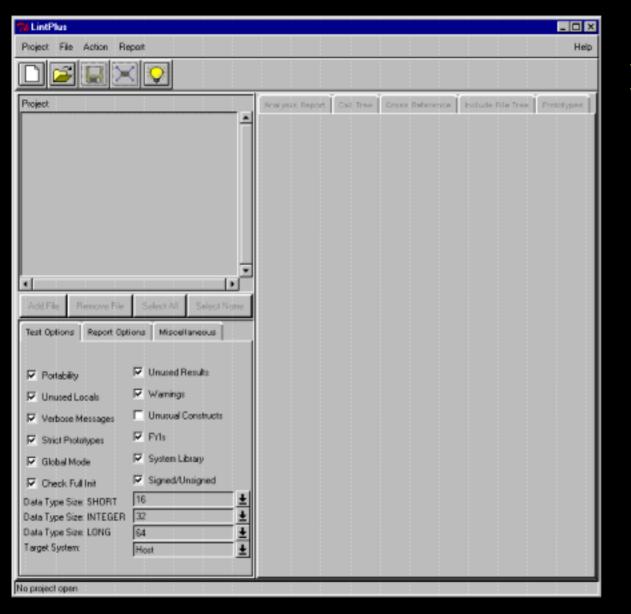
# How to stop C programming problems at the source

Cleanscape LintPlus Source Analyzer for C Tutorial and Demonstration

Keywords: software programming tools, static source code analyzers, c language, lint, software test automation, source code analysis, C language, software development automation



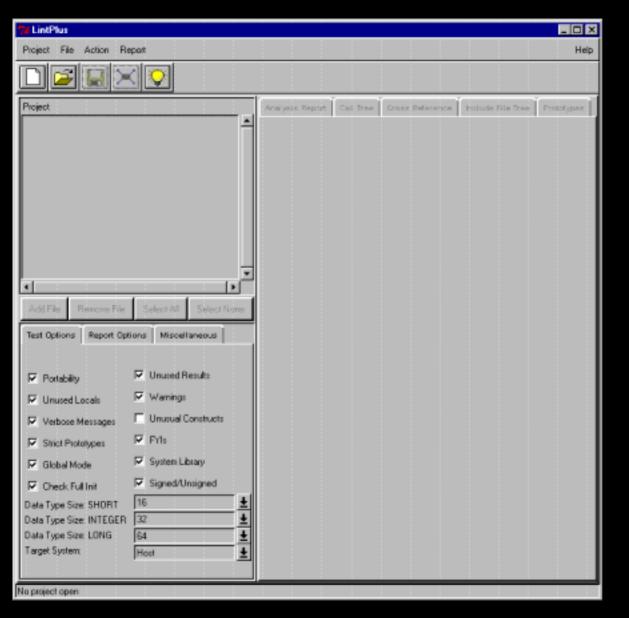


### Introduction

- Advanced Static Source Code Analysis for C
- Catch problems in source code
  - Develop faster, better, smarter, cheaper, cleaner
  - Reduce risk

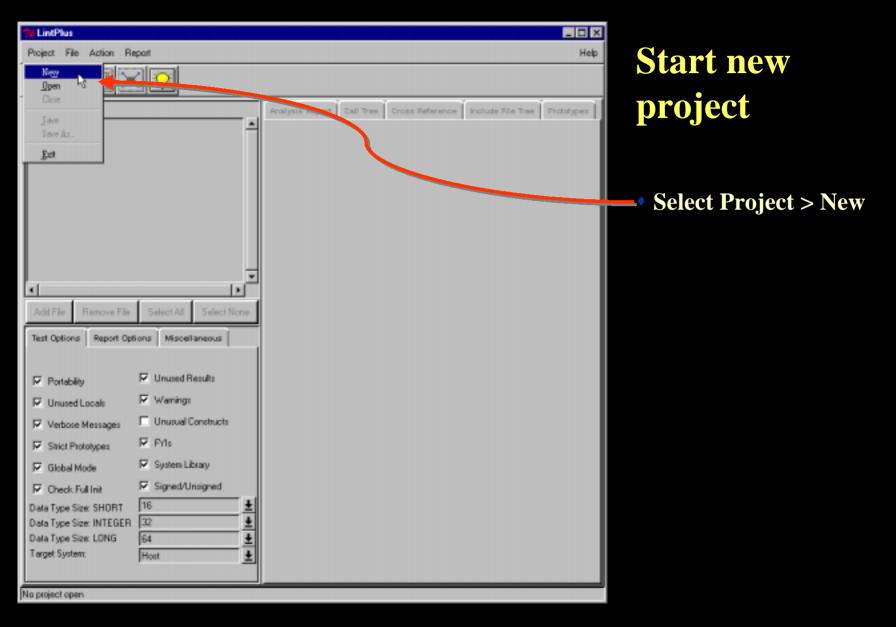
#### • Ideal for:

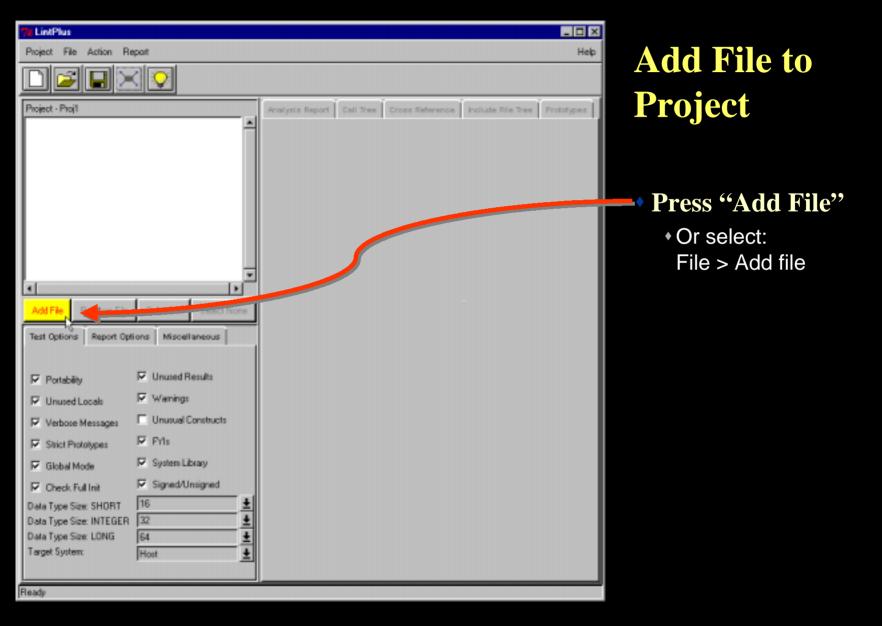
- Packaged software development
- Cross-platform development
- Embedded systems development



# Graphical User Interface

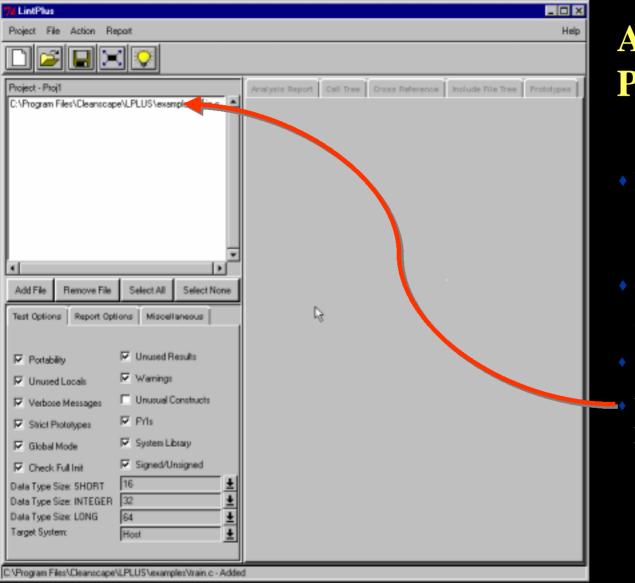
- Just click to access to powerful analysis features
- Simple to use
- No learning curve





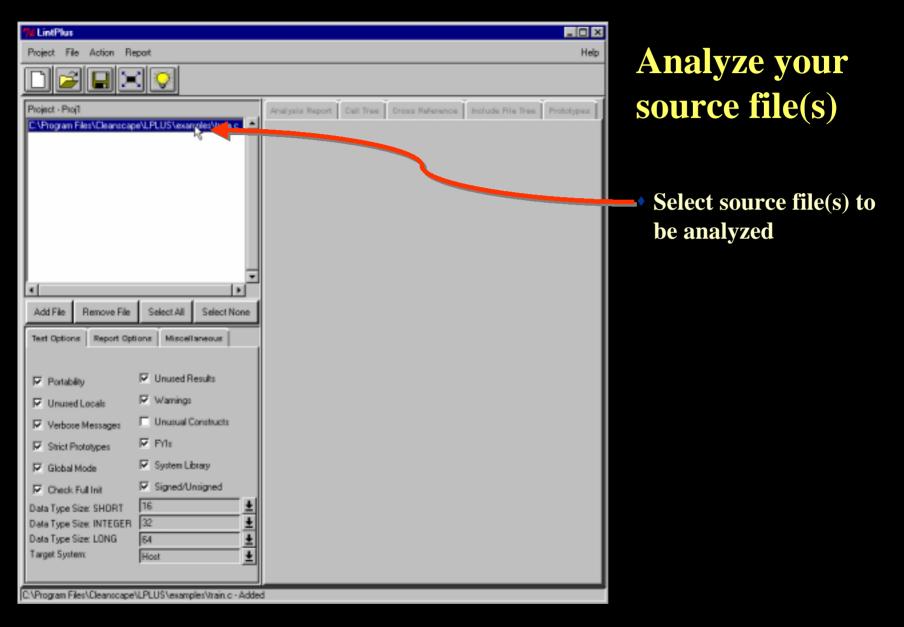
LintPlus	
Project File Action Report Help	Add File to
Project - Proji Project - Proji Project - Proji Add files to project Lock jrc exemples Lock jrc exemples Protobility Test Options Rep Verbook Messay File game: Itain c Verbook Messay File of type: C sources Static Phototypes File of type: C sources Static Phototypes Static Phototypes Static Phototypes Static Phototypes Static Phototypes	<section-header><list-item><list-item><text></text></list-item></list-item></section-header>
Image: Check Full Init     Image: Signed/Unsigned       Data Type Size: SHORT     16       Data Type Size: INTEGER     32       Data Type Size: LONG     64       Target System:     Host	
or Help, press F1	

Add files to project	
Pojed: Poil Pojed: Poil Pojed: Poil Projed:	File to
Add files to project	
<ul> <li>Add files to project</li> <li>Cock jr:</li> <li>examples</li> <li>i i i i i i i i i i i i i i i i i i i</li></ul>	
For Help, press F1	> Add file : file(s) to be zed



# Add File to Project

- Press "Add File"
   Or select: File > Add file
- Select file(s) to be analyzed
- Click "Open"
- View the project files in Project window



72 LintPlus		
Project File Action Report	Help	Analyze your
Project - Proj1	Analysis Report Call Tree Cross Reference Include File Tree Prototypes	source file(s)
C VProgram Files/Cleanecape/LPLUS/examples/train.c		
		<ul> <li>Select source file(s) to be analyzed</li> </ul>
		Select Test Options
Add File Remove File Select All Select None		
Test Options Report Options Niscellaneous	<u> </u>	
Portability IP Unused Results		
🔽 Unused Locals 🖾 Warnings		
Verbose Messages Unusual Constructs		
Shict Prototypes F FY1=		
Global Mode System Library		
Check Full Init     Otata Type Size: SHORT     16		
Dala Type Size: INTEGER 32		
Data Type Size: LONG 64 ± Target System: Host ±		
L C:\Program Files\Cleanscape\LPLUS\esamples\Vrain.c - Adde	d	

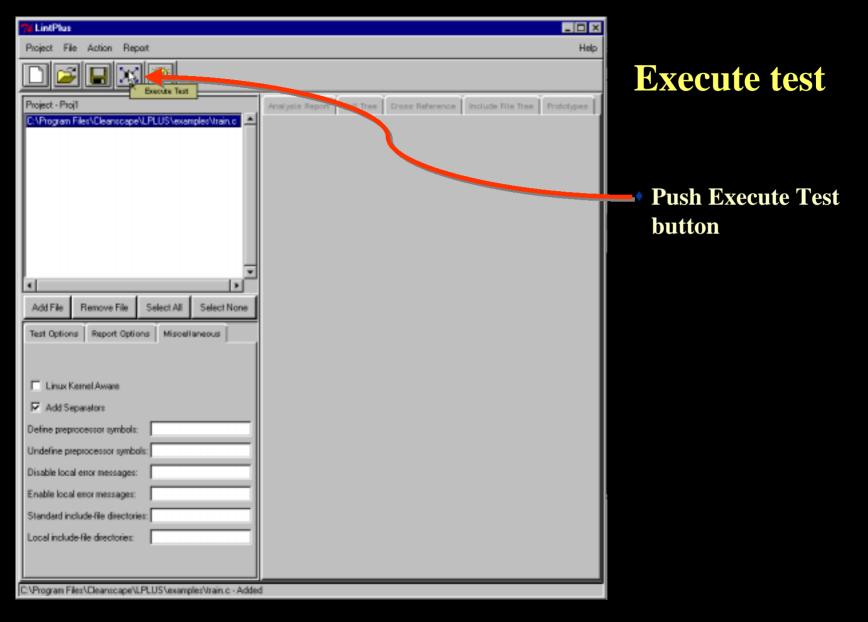
🕫 LintPlus	
Project File Action Report	Analyze your
Project - Proj1 Analysis Report Call Tree Cross Reference	Include File Tree   Prototypes   Source file(s)
Add File Remove File Select All Select None  Test Options Report Options Miscelfaneous	<ul> <li>Select source file(s) to be analyzed</li> <li>Select Test Options</li> <li>Select Report Options</li> </ul>
Include Tree I⊽ Cross-Reference	
Call Tree Save Reports with Project	
Trim Tree C Source Listing	
Squash Tree List Includes	

7/ LintPlus	
Project File Action Report	Help
Project - Proj1	Analysis Report Call Tree Cross Reference Include File Tree Prototypes
CMProgram Files/Cleanscape/LPLUS/examples/Utain.c	
Linux Kernel Aware	
Add Separators	
Define preprocessor symbols:	
Undefine preprocessor symbols:	
Disable local error messages:	
Enable local error messages:	
Standard include-file directories:	
Local include-file directories:	
C:\Program Files\Cleanscape\LPLUS\examples\train.c - Adde	đ

## Analyze your source file(s)

- Select source file(s) to be analyzed
- Select Test Options
- Select Report Options
- Select Miscellaneous Options

2/1/02



### **Execute test**

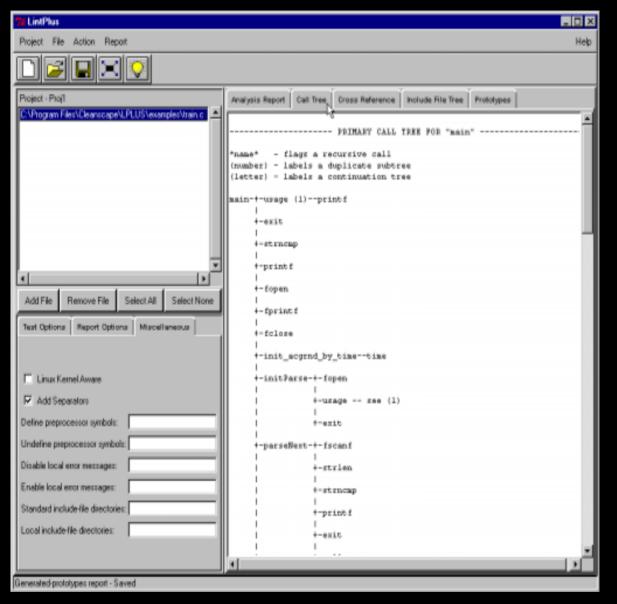
- Push Execute Test button
- Don't blink!
  - Almost instantaneous processing for 100,000 lines of code
  - A few seconds for
    1 million lines of code

#### Analysis Report

- Call Tree Report
- Cross Reference Report
- Include File Trees Report
- Prototypes Report

15

2/1/02



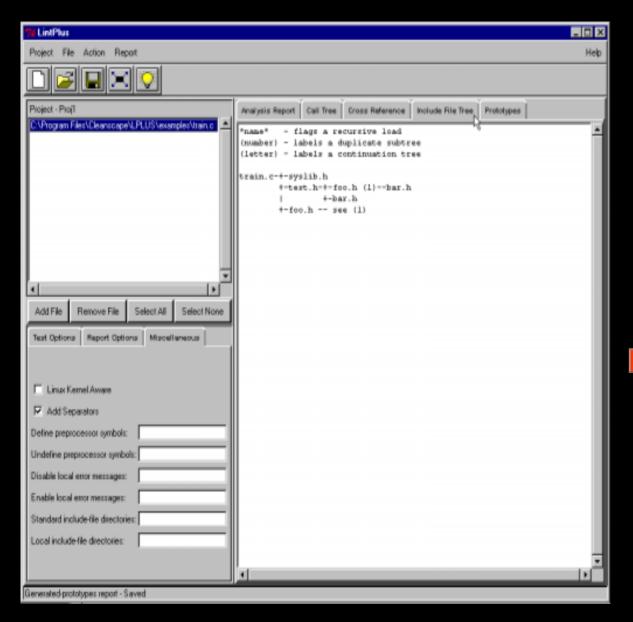
Analysis Report

Call Tree Report

- Cross Reference Report
- Include File Trees Report
- Prototypes Report

71 LintPlus						-	
Project File Action Report							Help
Project - Proj1	Analyziz Report	Call Tree	Cross Reference	Include File Tree	Prototypes		
C. VProgram Files \ Cleanscape \L.PLUS \ examples \ Vrain c 📩	-D definitio		FUNCTION CR	declaration			•
	-> prototype		-R function				
	float Diogist a-1\0 1336	leanscap	e\LPLUS\examp1 1 1348	es\train.c 1419-D	144-P	1329	I
	float acgrnd( a-1\0 332		e\LP5US\examp1 1472-D	es\train.c	147-8	326	I
Add File Remove File Select All Select None	void addIfNev a~1\0 720		e\LPLUS\exampl 788-D	es\train.c	133-P	707	I
Test Options Report Options Miscellaneous	double atof() a-1\0 741	P	e\LP5US\examp1	es\train.c	739	740	I
Linux Kernel Aware     Add Separators	int atoi(); a~1\0 746	leanscap 747	e\LPLU5\examp1 749	es\train.c	74Z	744	I
Define preprocessor symbols:	void calcErro a-1\0 477		e\LPLUS\exampl 513	es\train.c 1073-D	137-P	401	I
Disable local error messages:	void calcOuty a~1\0 1113	leanscap	e\LPLUS\exampl 2-D	es\train.c	139-P	460	I
Standard include file directories:	char "ctime() a-1\0	-	e\LPLUS\exampl	es\train.c	1502-	1506	
Local include-file directories:	char *date(); a-1\0		e\LPLUS\exampl 	es\train.c	150-P	379	Ľ
Generated prototypes report - Saved		_					

- Analysis Report
- Call Tree Report
- Cross Reference Report
- Include File Trees Report
- Prototypes Report



- Analysis Report
- Call Tree Report
- Cross Reference Report
- Include File Trees Report
- Prototypes Report

2/1/02

7/ LintPlus	
Project File Action Report	Help
Project - Proj1	Analysis Report Call Tree Cross Reference Include File Tree Prototypes
Project - Proj1 C.VProgram Files/ICIbanscope/L.PLUS/sexamples/Urain c	<pre>Analysis Report Call Tree Cross Reference Include File Tree Prototypes GENEPATED PROTOTYPES GENEPATED PROTOTYPES float acgrnd(); void addIfNew(char *); void calcError(struct set_struct *,float *); char *date(); int fexists(char *); void initParse(char *);</pre>
Linux Kernel Aware  Add Separators  Define preprocessor symbols:  Undefine preprocessor symbols:  Disable local error messages:  Enable local error messages:  Standard include file directories:  Local include file directories:  Generated prototypes report - Saved	<pre>void init_acgrnd_by_time(); void loadSet(struct set_struct *,char **,int,char *); float logistic(float); int main(int,char **); int main(int,char **); void nLinesWords(char *,int *,int *); int parseNext(); int printData(char *,struct pattern_struct *); void printNet(int,int,int,float *,float *,fl</pre>

- Analysis Report
- Call Tree Report
- Cross Reference Report
- Include File Trees Report

Prototypes Report

7% LintPlus		
Project File Action Report	Help	
Save Andycki Save Complete Boport Call Tree Cross Ba		
Project Proj1 Print Include ]		
VPiogram Files/LElears     Print Complete Report     Print Complete Report     Print Complete Report     floa     f		
Define preprocessor symbols:	main(int,char **);	
Undefine preprocessor symbols:	nysystem(char *);	
	int parseMent();	
	printData(char *,struct pattern_struct *);	
Local include-file directories	<pre>i printNet(int,int,int,float ",float ",fl</pre>	
Generated prototypes report - Saved		

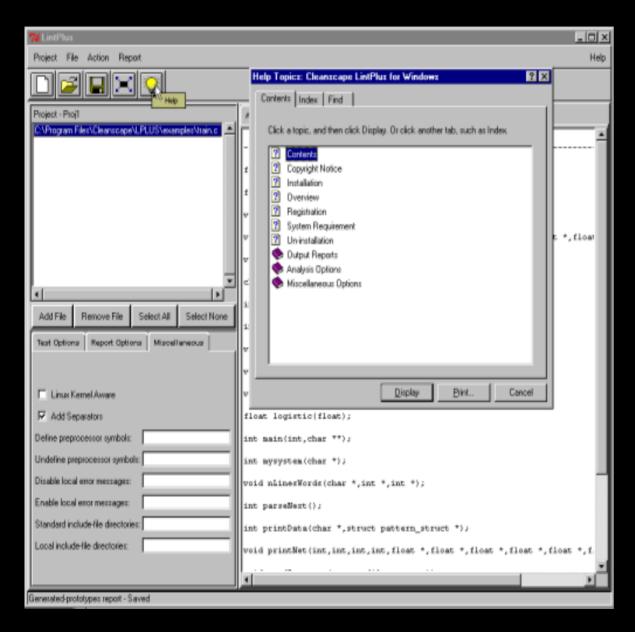
# Save & Print Reports

#### Save

- Select Report > Save
  - Select each report separately
  - Save complete report

#### Print

- Select Report > Print
  - Print each report separately
  - Print complete report



# Get help

- Online Help
   Push Help button
- Documentation
  - Getting Started Guide
  - User Guide
  - Tutorial
- Support

http://www.cleanscape.net

Project File Action Report	
Project File Action Report File Action Report Save your	
Project - Proj Analyziz Report Call Inter Crozz Reference Include Rile Tree Prototypez	
ENTRATED PROTOTYPES	
float Diogistic(float);	
(lost acgrnd();	
void addIfNew(char *);	
void calcError(struct set_struct ",float ",float ",float ",float ",float ",float	•
void caleOutput(float *, float *, float *, float *)	e
thar *date();	
Push Save     Push Save	
Add File Remove File Select None into findFile(char *);	
Test Options Report Options Miscellaneous void initParse(char *);	
<pre>void init_acgrnd_by_time();</pre>	
Linux Kenel Aware void loadSet(struct set_struct *, char **, int, char *);	
F Add Separators float logistic(float);	
Define preprocessor symbols: int main (int, char **);	
Undefine preprocessor symbols: int aysystem (char *);	
Disable local even messages: void nLinesWords (char *, int *);	
Enable local error messages: into parseNext();	
Standard include file directories: int printData(char *,struct pattern_struct *);	
Local include-file directories: void printNet(int,int,int,int,float *,float *,	
For Help, press F1	

👫 LintPlus 📃 🔜 🕺	
Project File Action Report Help	Sovo vour
	Save your
Project - Pioj1 Analysis Report Call Tree Cross Reference Include File Tree Prototypes	project
C.\Program Files\Cleanscape\LPLUS\examples\train.c  GENERATED PROTOTYPES	
float Dlogistic(float);	
float acgrnd();	
void addIfNew(char *);	<ul><li>Push Save button</li></ul>
Save As	Two project nome
Save jn: 🔄 Cleanscape examples 💌 💽 🚮 📅 🖽 п 🔹 *) ;	Type project name
	<b>→ Push Save</b>
Add File Remove File Selec	
Text Options Report Options N	
Linux Kemel Aware     File gene: Cleanscape test     Save     Save	
Add Separatore     Save as type: LintPlus Project Files (*.bp)     Cancel	
Define preprocessor symbols:	
Undefine preprocessor symbols int mysystem(char *);	
Disable local enor messages: void nlinesWords(char +,int +);	
Enable local error messages: int parseNext();	
Standard include file discotories: int printData(char *,struct pattern_struct *);	
Local include file directories void printNet(int,int,int,int,float *,float *,f	
x	
For Help, press F1	



#### Software Development Powerfully Simplified

- Code: Automatically generate code from patterns
- Analyze: Stop problems at the source
- Test: Test and visualize software
- Manage: Automate the software development process

#### http://www.cleanscape.net

### LintPlus

- Gives you advanced Static Source Code Analysis for C
- Helps you catch problems in source code to
  - Develop faster, better, smarter, cheaper, cleaner
  - Reduce risk

#### Is ideal for:

- Packaged software development
- Cross-platform development
- Embedded systems development