XLTEST - Excel spreadsheet quality check

What XLTest can do for you

Detailed documentation reveals all the non-obvious content of the spreadsheet. It can reveal hidden rows, columns, and sheets. It helps you get to grips with a large spreadsheet that you have to understand.	
Colour maps give you an easily readable visualization of the structure and content of a spreadsheet. Inconsistent formulas and data stand out for attention.	900 640 445 611 6556 725 64 255 389 5263 1 4145 3124 3489 3173 38300 2 240 871 153 408 47703 3 377 616 224 457 6678 3 959 1955 651 1002 7074 3 959 1955 651 1002 7074 3 431 853 184 989 6114 4 215 4394 428 4150
Detailed error checking makes it easy to find and fix errors far more quickly than with tedious cell-by-cell inspection.	A B C 1 A.commendium of error values 2 2 Distailed Check E 3 AMyTest.ds E 4 SMF_Enror(1) Beltematics 5 Report as at ####################################
Test case maintenance and documentation make it easy to prove regression testing	Test Case Comment Test Sheet Test Cells Test Value TestCase1 General comment ActiveSheet Value
Utilities provide more ways to test, such as profiling VBA performance.	Add Debug code
Worksheet and workbook comparisons make it easy to see what has changed between two versions of a spreadsheet file	Vertil C C E 2 Vertil C E E 2 Vertil Vertil E E
Convenient keyboard and menu shortcuts make navigation and operations easier	Image: Solution of the soluti
Quickly scan folders of Excel files to create an inventory of spreadsheets and their statistics to assist in risk assessment	A B C D E F G H 1 Fullhame Full OCCUStampler/SLIS* Digits ALIS* Di

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Installation

Unzip the distribution package into a directory of your choice. You may need to unblock the file because Windows suspects files sent by email. To do this:

- 1. Locate the add-in file XLTest174.xlam in its folder in "Windows Explorer".
- 2. Right-click on the file and select "Properties" from the menu.
- 3. Click "Unblock" on the General tab. Click "OK".

If Excel crashes, it may decide to disable an add-in. To re-enable it:

- 1. Click "File", "Options". In the categories pane, click "Add-ins".
- 2. In the details pane, locate the add-in in "Disabled Application Add-ins".
- 3. In the Manage box, click "Disabled Items", and then click "Go".
- 4. Select the add-in and click "Enable".

You need to enable an Excel Trust option if you wish to analyse VBA content, otherwise (for example it may be blocked by your corporate Group policy), XLTest will be able to analyse spreadsheets but not VBA. To do this, click File, then Options; Trust Center, <u>T</u>rust Center Settings; in the Macro settings section, enable "Trust access to the VBA Project object model".

To install XLTest, in Excel Options click Add-Ins, in the Manage dropdown select Excel Add-ins, click <u>G</u>o, click <u>B</u>rowse, open the folder into which you unzipped the package, and select the file XLTest174.xlam.

To uninstall, go to the Add-Ins dialog as above, then deselect "XLTest spreadsheet tester".

The distribution package also contains example files. EX1Demo.xls has some changes to EX2Demo.xls to exercise the workbook comparison feature of XLTEST. In this document, screenshots are from EX1Demo.xls. TriangleFormula.xls is an exercise in the Test Cases feature of XLTest. You may receive a macro security warning on opening the files; if so, enable the macros. If you receive a circular reference warning, click Cancel.

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XLTest

Recent Version History

Changes up to version 1.74 (September 2021)

- 1. Start Session dialog changed to show internal workbook information before opening, and to open in manual calculation to prevent recalculation.
- 2. Start can remove sheet protection from unprotected OpenXML files to simplify processing.
- 3. Reports legacy BIFF properties in xls files to sheet \$FileDoc.
- 4. Handles Unicode file and folder names.
- 5. Warns on unusual range name reference starting with "=!".
- 6. New #Error values (#SPILL! etc) are reported in the detailed inspection.
- 7. Right-click shortcut to filter where-used listings for Names, Styles, Links.
- 8. Performance improvements.
- 9. VBA performance timing at procedure and optionally line level.

Changes in version 1.67 (November 2019)

- 1. VBA code is commented out before analysis, to avoid interference from event handlers.
- 2. XML protection is checked before the test workbook is opened.
- 3. Fix for incomplete VBA module/procedure listing

Changes in version 1.65 (April 2019)

- 1. Colour by Protection format
- 2. Cell comparison with character difference in Comparison menu
- 3. Remove secure Protection from XML
- 4. Partial recalculation with timing
- 5. Add VBA debugging and profiling code
- 6. Ribbon menu shows Calculation and Memory status

Changes in version 1.57 (July 2016)

- 7. Copy to New Workbook makes a clean copy without excess names and styles
- 8. Scan Files menu: more output options, List DB Schema command added
- 9. 64-bit Excel and Excel 2016 compatibility
- 10. Several usability tweaks: Workbook operations in own menu from Utilities menu, checking for path lengths over 200 characters, two-level progress bar for batch testing, improved Styles Cleaner, stability improvements.

Changes in version 1.56 (Jan. 2016)

- 11. File open passwords now case sensitive
- 12. Records both Workbook Open and Worksheet Protect passwords
- 13. Option to skip checking link status which would cause password prompt

Changes in version 1.55 (Apr. 2015)

- 1. On startup checks and fixes autonumber seed problems in database
- 2. Processing limit of 1 million cells made an option
- 3. ExportActiveProject procedure runnable by user
- 4. VBA Sort Procedures option
- 5. Option to list all sheet statistics separately when scanning files
- 6. Demo / 30-day evaluation version made available
- 7. Utility option to display current autofilter criteria
- 8. Numerous usability tweaks, Excel 2013.

(Earlier version changes not listed here)

The XLTest menu and toolbar

The XLTest tab appears after the Review tab of the Ribbon. The colours of the icons may be different depending on the version of Excel you use or your Office theme.

File	Home	Insert	Page La	yout	Formulas	Dat	a Rev	iew XL1	est	View
Start	Visualize and Document -	Compare	Test Cases -	Utilities	Workbook •	Scan Files *	Shortcut Keys •	Automatic No Iteratio	Men n	n:235MB

Each button has a shortcut key you can see by pressing the Alt key and then S. To learn how to use the menu, we suggest you work through the XLTest menu items in the following order with the examples shown.

The Start menu has the options

- 1. Start new test session
- 2. <u>XLTest</u> options
- 3. Batch process
- 4. <u>H</u>elp, About XLTest

The 'Visualize and Document' menu has the options

- 1. Workbook documentation
- 2. <u>R</u>eset settings, Unhide structure
- 3. Detailed Inspection
- 4. Styles and <u>C</u>onditional Formats
- 5. <u>Formulas List</u>, Colorize
- 6. Data Validation Formulas
- 7. Colorize by Protection
- 8. Data Type and usage
- 9. Colorize by <u>P</u>recedents
- 10. Colorize by Dependents
- 11. <u>D</u>ecolorize worksheets
- 12. Show Watch info
- 13. Add \$TOC, ReadMe, Palette

The '<u>C</u>ompare' menu has the options

- 1. Compare two cells
- 2. Compare worksheets
- 3. Compare workbooks
- 4. Quick diff report
- 5. Compare <u>VBA</u> projects

The '<u>T</u>est Cases' menu has the options

- 1. <u>N</u>ew test case workbook
- 2. <u>R</u>un test cases
- 3. \underline{T} ests to Scenarios
- 4. <u>Scenarios to Tests</u>

The 'Utilities' menu has the options

- 1. Remove secure <u>P</u>rotection from XML
- 2. Toggle R1C1/A1
- 3. Show active <u>A</u>utofilter
- 4. Reset Text To Columns settings
- 5. Reset Excel status
- 6. Recale Workbook
- 7. Recalc Sheets
- 8. <u>R</u>ecalc Selection
- 9. Recale <u>F</u>ormulas
- 10. Profile $\underline{V}BA$ execution

The ' \underline{W} orkbook' menu has the options

- 1. <u>Clear Unused Range</u>
- 2. Delete all <u>Styles</u>
- 3. Save Copy <u>A</u>s...
- 4. Copy to new <u>w</u>orkbook
- 5. Unprotect active sheet
- 6. Unprotect work book and sheets
- 7. Delete Unused Number Formats
- 8. Unhide/Delete Names
- 9. <u>Import all VBComponents</u>
- 10. Export all <u>V</u>BComponents
- 11. Export VBProject to text file

The 'Scan <u>F</u>iles' menu has the options:

- 1. List Excel filenames
- 2. Analyse files in list
- 3. Run macro on files
- 4. Manage passwords
- 5. Set Master password
- 6. List records for a file
- 7. SQL Command / Query DB
- 8. <u>C</u>ompact and Repair DB
- 9. List DB Schema

The 'Shortcut Keys' menu has the options: <u>1</u> Copy Formula <u>2</u> Copy Text <u>3</u> Copy Address <u>4</u> Operate on selection <u>5</u> Go To Reference <u>6</u> Flag active cell <u>7</u> Select from Active cell <u>8</u> Select Formula region <u>9</u> Selection in Names <u>0</u> Jump to bottom right [Show Precedent formulas] Show Dependent formulas <u>View \$DB_ filtered by this</u> <u>R</u>efresh Right-click menu

The numbers and square brackets in the Shortcut Keys menu are the shortcut keys you can press with Ctrl+Alt. XLTest also adds the Key Shortcuts options to the end of the cell context pop-up menu that appears when you right-click on a cell. If you do not see them, use the menu option 'Refresh Right-click menu'.

At the end of the XLTest group in the Ribbon is a set of information displays that shows the current recalculation status and memory usage.

XLTest provides 14 extra user-defined functions that you can use in your spreadsheets. These are listed at the end of this document.

The Start menu



Start > Start new test session

Open workbook for testing, start documentation, create \$APP sheet

Start New Test session	×
Close all other open workbooks including the personal macros	
Click the Select button to pick an Excel workbook to test. If it does not have a workbook open password, some initial properties will be examined. An audit log workbook will be created in manual calculation mode to document the test findings.	
<u>S</u> elect	
Permana back & aboot protection if any (OnerVMI, ank)	
Remove book & sneet protection if any (OpenAML only)	
When you click OK, it will be opened read-only, no recalculation, links not updated, workbook_open macro not run.	
□ Export <u>V</u> BA to a _VBC subfolder	
Comment out the VBA code to suppress event handlers In all modules	
○ In document modules only (workbook, sheets)	
\bigcirc Do not comment out the code	
<u>O</u> K <u>Cancel</u>	

If you check "Close all other...", XLTest closes all open workbooks including the personal macro workbook (PERSONAL.XLS or .XLSB) which is normally hidden.

When you click "Select", XLTest prompts you with a File Open dialog:

X Select						×
$\leftarrow \rightarrow \checkmark \uparrow$ 1 > This	PC > F (F:) > Examples		~ U	Search Examples		م
Organize New folder					•	0
🖹 Documents 💉 ^	Name	Date modified	Туре		Size	
Nictures 🖈	EX1DEMO.XLS	19/09/2008 14:17	Microsoft Excel 9	7-2003 Worksheet	120 K	В
Microsoft Excel	EX2DEMO.XLS	09/02/2011 15:51	Microsoft Excel 9	7-2003 Worksheet	138 KI	В
Desktop	TriangleFormula.xlsx	04/08/2016 14:24	Microsoft Excel V	/orksheet	47 KI	В
File <u>n</u> ame	e:		~	All Excel files (*.x	(l*)	~
			Too <u>l</u> s 💌	<u>O</u> pen	Cancel	

The dialog will then update to show you any internal information that XLTest has been able to read before opening. This is obtained from the BIFF records of .XLS format files, or the XML of OpenXML files of Excel 2007 and later. It will be recorded in the \$FileDoc tab of the XLTEST_LOG workbook (see below). If the workbook is protected, it will not be able to retrieve this information and you will need its password to open it.

d:19/09/2008 13:17:45,	
orkbook, has VBProject, alc Mode automatic, Calc B	Engine 11.421
	ed:19/09/2008 13:17:45, /orkbook, has VBProject, Calc Mode automatic, Calc I

When you click OK, XLTest opens a new workbook named "\$XT(1) XLTEST_LOG.xlsx" in manual calculation mode. This will ensure that the workbook under test will not be recalculated automatically when opened, which might change its data.

For OpenXML files, it exports a file "styles.xml", which it uses to check for excessive styles, and to report on Custom Number Formats (see below). If you checked "Remove book and sheet protection", those attributes are removed from the XML and a backup copy of the workbook is created.

XLTest opens the file you select read-only and with macros disabled. If you checked "Export VBA ...", XLTest will create a folder named after the workbook plus "_VBC" and export the VBProject modules to there.

If you checked the "Comment out..." option and the VBproject is unlocked, it comments out VBA code to disable any event handlers such as Sheet_Change.

It displays a summary message now that this workbook has been opened.

Calculatio	on Status	×		
i	"F:\Examples\EX1DEMO.XLS" Excel 97-2003 Workbook (xls) [Compatibility Mode] Calc Engine 11.421, Calc Mode automatic, Max Iterations 1 Max change 0.001 VBProject not locked will be exported and commented out Time to open: 0:01 1 other workbook was open before this was opened.			
	Calculation mode has been set to manual, no iteration, for analysis purposes			
	OK Cancel			

The XLTEST_LOG workbook will contain the various documentation sheets produced during an XLTest session. The sheet named XLTEST_LOG contains a record of each test performed and the time. It also has a sheet \$APP showing your current Excel settings, add-ins, and custom menus, so that you can review any Excel options that may need changing. Be sure to switch back to viewing the workbook under test before using more XLTest options.

			0	
Excel Application Settings	05/04/2019 16:09	C:\Program Files (x86)\Microsoft Office\Root\Office16		
	1			
Application Setting	Value	Notes		
Operating System	Version	Windows (32-bit) NT 10.00	1	
Excel Version Number	16	32-bit, Build 11328		
Excel User Name	@ExcelAnalytics	Separate from the Windows login user name		
Organization Name		Registered organization name		
Standard Font	Arial 11			
Default File Path		C:\Users\me\AppData\Roaming\Microsoft\Windows\Recent		
Open all files in	Startup folder	n en en her her her her die en der eine eine der her her her her her her her her her h		
Custom List Count	8			
Default Save Format	51	Excel 12 Workbook (xisx)		
Display Formula Bar	Visible			
Display Status Bar	Visible			
Display Scroll Bars	Visible			
Display comments, indicators	Indicators			
Calculation Interrupt Key	Any Key			
Calculation method	Manual	May have been set by XLTEST or another workbook opened		
Calculation Iterations	Max Iterations: 1, Max change: 0.001	This suppresses warnings about any circular references		
Calculate Before Save	Disabled	It is recommended to enable this		
Fixed Decimal places	Disabled			
Auto Complete	Enabled	This may enter unexpected values if the user is not careful.		
Prompt for Workbook properties on save	Disabled			
Reference Style	A1			
Transition navigation keys	Disabled			
Asks to Update Links	Enabled	Whether Excel asks the user to update links whenever a file that contains links is opened		
Extend list formats and formulas	Enabled	This may cause formulas to be unexpectedly changed.		
Background error checking	Enabled			
Auto Recover save interval	Disabled	minutes. It is recommended to enable this		
Add-Ins installed	No.	Comments	FullName	Author
Microsoft Power View for Excel	1	{509E7382-B849-49A4-8A3F-BEAB7E7D904C}		
Microsoft Power Map for Excel	3	(F39D01F3-69C1-45E1-93B2-7BF0BC6EB63E)		
Microsoft Excel Code Compatibility Inspector	4	{0000000-0000-0000-00000000000000000000		
Microsoft Data Streamer for Excel	5	{0000000-0000-0000-00000000000000000000		
Inquire	6	(237428F1-F2C7-4F86-B7ED-ADE148ACF95F)		
Microsoft Power Pivot for Excel	7	(A2DBA3BE-42CC-4D0E-95FD-BCAA051BA798)		
	Application Setting Operating System Excel Version Number Excel Version Number Excel Version Name Organization Name Standard Font Default File Path Open all files in Custom List Count Default Save Format Display Scroll Bars Display Comments, indicators Calculation Interrupt Key Calculation Interrupt Key Calculation Interrupt Key Calculation Interrupt Key Calculation Interrupt Ney Calculation Interrupt Ney Calculate Before Save Fixed Decimal places Auto Complete Transition navigation keys Asks to Update Links Extend list formats and formulas Background error checking Auto Recover save Interval Add-Ins installed Microsoft Power View for Excel Microsoft Power View for Excel Inquire Microsoft Power Pivot for Excel Inquire	Application Setting Value Application System Version Excel Version Number 16 Excel Version Number @ExcelAnalytics Organization Name 311 Obtault File Path 0 Openail files in Startup folder Custom List Count 8 Default File Path 6 Openail files in Startup folder Custom List Count 8 Daplay Formula Bar Visible Display Scroll Bars Visible Display Commets, indicators Indicators Calculation Interrupt Key Any Key Calculation method Manual Calculation method Manual Calculation method Mas Iterations: 1, Max change: 0.001 Calculation navigation keys Disabled Axis to Update Links Enabled Pompt for Workbook properties on save Di	Application Setting Value Notes Operating System Version 16 32-bit, Build 11328 Excel Version Number (Excel/nailytics Separate from the Windows (32-bit) NT 10.00 Excel Version Number (Excel/nailytics Separate from the Windows login user name Organization Name (Excel/nailytics Separate from the Windows) Recent Default File Path (C:Users'me:AppData)Roaming/Microsoft/Windows)Recent Open all files in Startup folder Custom List Count 8 Dafault Save Format 51 Diplay Status Bar Visible Diplay Status Bar Visible Diplay Somula Bar Max Iterations: 1 Calculation Interations Max Iterations: 1, Max change: 0.001 This suppreses warnings about any circular references 1 Calculation Interations Max Iterations: 1,	Application Setting Value Notes Application Setting Version 18 32-bit, Build 11328 Derailing System Version 18 32-bit, Build 11328 Excel Version Number @ExcelAnalytics Separate from the Windows login user name Organization Name Registered organization name Registered organization name Standard Font Arial 11 C:Users/me/AppDatal/Roaming/Microsoft/Windows/Recent Default File Path C:Users/me/AppDatal/Roaming/Microsoft/Windows/Recent Diplay Status Bar Visible Diplay Status Bar Diplay Commus Bar Visible Diplay Status Bar Diplay Status Bar Visible Diplay Status Bar Diplay Status Bar Visible Diplay Status Bar

The remainder of the Start menu items are described later. Next, we describe the options for creating documentation.

Visualize and Document menu

0	
Visualize and Co Document -	mpare Test Utilities Cases
Q Workboo	ok Document <u>a</u> tion
Reset set	ttings, Unhide structure
Detailed	Inspection
Styles an	d <u>C</u> onditional Formats
Eormulas	s List, Colorize
Data Vali	idation Formulas
Colorize	by Protection
Data Typ	e and <u>u</u> sage
	by <u>P</u> recedents
Colorize	by Dependents
	ze worksheets
Show Wa	atch info
	C, ReadMe, Palette

Workbook Documentation

Create \$DOC sheet for Workbook documentation

If you have not already done so, use *Start new test session* to open the sample workbook EX1DEMO.XLS read-only. XLTest opens a workbook for testing read-only so that you cannot accidentally overwrite the original. If you save the working file, it must be saved under a different name. You can use *Save Copy As* to save copies under different names, for example after each colouring exercise.

Documentation Options X				
All Automatically unprotect sheets				
□ Workbook settings				
\Box <u>Table of sheet statistics</u>				
Document Built-in and Custom Properties				
Inter-worksheet and External links, Data Sources				
Shapes with Onaction or Formula				
□ <u>V</u> BA statistics And References				
VBA list modules and procedures				
□ Defi <u>n</u> ed names				
□ St <u>y</u> les				
Custom Number <u>F</u> ormats				
Custom Color Palette				
Flagged notes added with XLTest				
Scenarios and Custom Views				
Place documentation worksheet in: \$XT_(2) XLTEST_LOG.xlsx				
<u>O</u> K <u>C</u> ancel				

The <u>All checkbox toggles all the selections on or off.</u> If you check 'Automatically unprotect sheets', which only applies to weak protection in Excel before 2007, you will be shown what password worked on them. This does not happen with the Ex1demo example because only a blank password was used.



This is an example \$Doc sheet in the \$XT documentation workbook:

14	A	В	С	D	E
1	AuditID		04-Mar-20	12:22:18	
2	Property	Туре	Name	Value	
3	1 10 11 1	File	Volume	F	
4	2	File	Path	F:\Examples	
5	3	File	Name	EX1DEMO.XLS	
6	4	File	Size	122880	
7	5	File	Modified	19/09/2008 13:17	
8	6	File	Attributes	RA	
			Excel 97-2003 Workbook (xls)		
9	7	Workbook	[Compatibility Mode]	F:/Examples/EX1DEMO.XLS	
10	8	Workbook	CalculationVersion	Calc Engine 11.421	
					Calculation status reported in
11	9	Workbook	Calculation	Calc Mode automatic	SFileDoc
12	10	Workbook	Iteration	Iteration	
13	11	Workbook	Calculate before Save	Disabled	
				[Compatibility Mode], 1 Custom	
				Document Properties, Check	
14	12	Workbook	Settings	Compatibility ,	
15	1.12				
				Examples for XLTest demonstration	
16	1	Buit-In	Title	with VBA	
17	2	Buit-In	Subject	Spreadsheet User Self-checking	
18	3	Built-In	Author	Patrick O'Beirne	
19	4	Buit-In	Manager		
20	5	Buit-In	Company	Systems Modelling Ltd.	
21	6	Built-In	Category		
22	7	Buit-In	Keywords		
-			2	Spreadsheet Quality Test Demonstration	
23	8	Buit-In	Comments		
24	9	Buit-In	remplate		
25	10	Buit-in	Last Author	MSDN2003	
20	11	Built-In	Revision Number	04 07 20000 00 05 00	
21	12	Buikin	Creation Date	01/07/2008 09:05:03	
28	14	Buit-in	Last Save Time	15/09/2008 21:42:58	
23		0	Charles II	The Tester	
30	1	Custom	Checked by	The rester	
31	Collections	Count			
32	Check	Count			
33	All Links	4			
20	Par Links	2			
00	Caperadian				
30	Connections	1			
31	Uther Links	0			
-38	Names	4	Al- 61-		
39	Styles	47	F:Examplesi-XML~ZIP/xfistyles.xml, Cannot Check NumberFormats		
40	Gustom Form	0			
41	Contra Vill	Mana	PL4		
42	Custom XML	Name	AML		
43	corer-ropertie	Patrick O Bernespreadsheet Quality	Test Demonstr		
44	Properties	systems Modelling Ltd.			
45	CoverPageP	openies			

Read the sheets to discover some interesting things about this workbook:

- 1. \$FileDoc: A list of properties obtained from the binary (BIFF) records. For .XLS files only. The file format, Excel build, calc engine build, and others.
- 2. \$Doc: A list of workbook properties, built-in and custom; a summary of functions used in the workbook; a list of any cells flagged using the Flag menu item; and a list of hidden settings reset. In Ex1Demo, calculation iteration was enabled, suppressing alerts about circular references. XLTest turns off iteration.
- 3. \$Sheets: a table gives summary statistical information about the sheets. The columns are Index, Codename, Name, Settings, Protection, First Entry, Last Cell, Last Data Cell, Last Column, Last Row, Cells, NonBlanks, Numerics, Errors, Sum, Min, Max, Comments, Formulas, FormatConditions, CF Cells, DV Cells, Objects, Tables, Query Tables, Hidden Rows, Hidden Columns, PrintArea, Page Header, Page Footer, Window Settings, Found In Formulas, Found In Values.
- 4. For Ex1Demo, \$Sheets reports that Sheet1 'Data' was protected and hidden; Sheet2 'Transfer' is very-hidden, a setting only available from the VBA Project, not from Excel's Format menu; and Sheet9 'Budget08' has some hidden columns and rows.
- 5. \$WSXref: A cross-tabulation of all sheets against all other sheets to show how the sheets refer to each other by formula links. It also lists everywhere that links are used.
- 6. \$Links: a list of the sources of external links, queries, and data connections.

- 7. \$Names: a list of the defined names along with their range dimensions and values, and any warnings about duplicate names. In a batch process, the column '\$DB_ Count' shows you how many uses of that name were found.
- 8. \$Styles: a list of the Styles in use with their properties (font, colour, etc) and whether any are not their default setting. Non-built-in-styles are highlighted in yellow in the 'Builtin' column. If you find that the Normal style has a Date number format, that is a corruption caused by pasting across different workbooks. In a batch process, the column '\$DB_ Count' shows you how many uses of that style were found.
- 9. \$Scenarios: A list of the scenarios in the workbook with their settings.
- 10. \$Views: A list of the custom views in the workbook with their settings.
- 11. \$Formats: a list of the custom number formats in the workbook, the number of sheets they are used in, and an example of each. Formats which hide data are highlighted in yellow. This sheet is produced only when there is an OpenXML styles.xml file saved.
- 12. \$VBA: a list of VBProject references, components, procedures, line count statistics, any of the "Find in VBA" strings (see below) that were found, and keyboard shortcuts assigned. These may have been commented out for safety when the file was first opened.

In more detail:

If the workbook was an Excel 2003 or earlier binary .xls file, the \$FileDoc sheet lists some properties of interest from the binary records.

1	A	В	С	D	E	F	G	н	1	J	К	L	М	N	0	Р
1	Workbook	Item	Name	Index	Report	Colorindex	TextValue	AltText	Count	er Location	Area	Number	Flag	ExtendedInfo	DataType	TypeName
2	EX1DEMO.XLS	Workbook	rupBuild	2057	Doc	C	8220	Excel Build 8220		1 BIFF		8220	FALSE	BOF	3	Long
3	EX1DEMO.XLS	Workbook	stName	92	Doc	C	Systems M	Write Access User Name BIFF7		1 BIFF		0	FALSE	WRITEACCESS	8	Text
4	EX1DEMO.XLS	Workbook	fLock	18	Doc	C	0			1 BIFF		0	FALSE	PROTECT	3	Long
5	EX1DEMO.XLS	Workbook	wPassword	19	Doc	C	0			1 BIFF		0	FALSE	PASSWORD	3	Long
6	EX1DEMO.XLS	Workbook	fRevLock	431	Doc	C	0			1 BIFF		0	FALSE	PROT4REV	3	Long
7	EX1DEMO.XLS	Workbook	f1904	34	Doc	C	0			1 BIFF		0	FALSE	1904	3	Long
8	EX1DEMO.XLS	Workbook	fFullPrec	14	Doc	C	11			1 BIFF		1	FALSE	PRECISION	3	Long
9	EX1DEMO.XLS	Workbook	dwBuild	449	Doc	C	114210	Calc Engine 11.421		1 BIFF		114210	FALSE	RECALCID	3	Long
10	EX1DEMO.XLS	Workbook	fAutoRecalc	13	Doc	C	1	Calc Mode automatic		1 BIFF		1	FALSE	CALCMODE	3	Long
11	EX1DEMO.XLS	Workbook	clter	12	Doc	C	11	Max Iterations 1		1 BIFF		1	FALSE	CALCCOUNT	3	Long
12	EX1DEMO.XLS	Workbook	fRefA1	15	Doc	C	1	Reference mode A1		1 BIFF		1	FALSE	REFMODE	3	Long
13	EX1DEMO.XLS	Workbook	fiter	17	Doc	C	17	Iteration		1 BIFF		1	FALSE	ITERATION	3	Long
14	EX1DEMO.XLS	Workbook	numDelta	16	Doc	C	0.001	Max change 0.001		1 BIFF		0.001	FALSE	DELTA	5	Numeric
15	EX1DEMO.XLS	Workbook	fSaveRecald	95	Doc	C	0			1 BIFF		0	FALSE	SAFERECALC	3	Long
16	EX1DEMO.XLS	Workbook	FileFormat	0	Doc	C	56	Excel 2000-2003 Workbook		1 BIFF		56	FALSE	FileFormat	3	Long
17	EX1DEMO.XLS	Workbook	VBProject	0	Doc	0	VBProject	Has VBProject		1 BIFF		0	FALSE	vbaProject.bin	8	Text
1.00																

The sheet \$WSXref can help you see the data flow from sheet to sheet.

	A	B	C	D	E	F
1	First reference by each sheet named across the page to external files and sheet names down the page	Count	Data	Errors	Budget08	Transfer
2	.\s3errors.xls	1		B15=VLOOKUP(B3,'F:\Examples\[s3errors.xls]Displays'!\$B\$		
3	Budget08	1		E20=Budget08!N70+'F:\Examples\[s3errors.xis]InsRow'!\$E\$	10. 	
4	Transfer	1			L5=TransferIB5	
6	Link / sheet (excluding OLE)	Туре	Used by			
7	.\s3errors.xls	Link 1	Errors!B15	=VLOOKUP(B3,'F:\Examples\[s3errors.xls]Displays'!\$B\$3:\$C\$	\$10,0)	
8	Budget08	Sheet	ErrorsIE20:	=Budget08IN70+'F:\Examples\[s3errors.xls]InsRow'I\$E\$5+B20)	
9	Transfer	Sheet	Budget08!L	5=Transfer1B5		
1000						

The sheet \$Sheets lists the sheets and their properties; the <u>XLTest Options</u> dialog (see below) defines strings that are reported in columns "Found in Formulas" and "Found in Values" if any of them are found in the sheet. The defaults supplied are:

In formulas:	#REF! INDIRECT(LOOKUP(MATCH(OFFSET(IF(*IF(GETPIVOTDATA(
In values:	password confidential error
In VBA:	error password Open .Save Data Source= DDEInitiate .ACCDB .MDB .XLS .TXT .CSV .HTM .XML :\ \\ :// .CommandBars .OnAction Shell URLDownloadToFileA

If you wish to select all the cells that match a given string, use the Find command in Excel, click the Find All button, then in the list of cells that appears, press Ctrl+A to select them all, then close the Find dialog.

The sheet \$VBA lists the References, the VBProject components (forms, normal modules, code behind sheets, and classes), and flags any which are missing the Option Explicit declaration. If the option "List VBA Modules and procedures" was selected, it also lists the procedure names and declarations. You can tell from these whether the code is unaltered Macro Recorder code with names like "Module1" and "Proc1" or whether they were hand coded.

If any lines of code contain the strings listed in "Find in VBA" above, they are individually listed. These strings were chosen to find lines that may open and get data from external files. You can of course tailor this to add your own special terms such as the names of corporate add-in functions.

Reset Settings, Unhide structure

Reset workbook settings, hidden rows, columns, sheets

Reset hidden settings	×
✓ Unhide sheets	
✓ Unhide rows, columns	
✓ Unhide drawing objects (shapes)	
\checkmark Shade tabs, rows, columns if were unhidden	
Place documentation worksheet in:	
\$XT_(1) XLTEST_LOG.xlsx	
<u>Q</u> K <u>C</u> ancel	

If the views in a workbook have been customised to hide elements such as gridlines and headings, these are reset to normal so as to be able to see them. XLTest reports what has been made visible or what settings have been turned off:

Formula and Status Bar Comment indicators Formulas Display turned off Gridlines, Row & Column Headings Horizontal and Vertical scrollbar Sheet tabs Zero values displayed Freeze Panes and Window Split removed Page Break Preview removed Zoom display reset to 100 Custom colour palette reset to Excel's standard colours



The items revealed are listed at the end of the \$DOC sheet if present.

47	Reset	Sheet Name	Unhidden structure
48		1 'Budget08'	1 Window Settings
49		2 'Errors'	1 Window Settings
50		3 'Budget08'	2 Hidden rows
51		4 'Budget08'	1 Narrow rows
52		5 'Budget08'	1 Hidden columns

XLTest

 Data	Errors	Budget08	Transfer	+

The tabs of sheets which XLTest unhides are given a gold colour. This is not done in the batch process because all the sheets are unhidden first.

You may wish to only unhide sheets, rows, and columns without also shading them; or you may wish to do neither.

If the sample workbook contains a protected sheet (the Ex1Demo example will not have one if you unprotected it during documentation), you are also asked:

Protected sheet	×
Enter the password to unprotect hidden sheet Data or leave blank for automatic unprotection	ОК
	Cancel

If you don't know what the password is, simply click OK and XLTest will try first a blank and then a sequence of patterns to find the one that will unprotect the sheet. If it fails, the secure protection of Excel 2013 and later may have been used and you did not check "Remove book and sheet protection" when starting the session. The Utilities menu can remove sheet protection from a <u>closed</u> workbook.

- 1. Sheet 'Data' had been hidden; XLTest has unhidden it and the sheet tab is coloured gold.
- 2. Sheet 'Transfer' had been very-hidden; XLTest has unhidden it and the sheet tab is coloured gold.
- 3. Sheet 'Budget08' had some hidden columns and rows, and some narrow rows or columns that might have been easily missed. When you look at that sheet, you will find they have been coloured gold.



Detailed Inspection

Create sheets of detailed cell inspection

In the example workbook, select the sheet 'Errors' and click the *Detailed Inspection* menu item in the XLTest Visualize menu.

Detailed cell inspection	×						
☐ All 4 Worksheets (uncheck to do 1 selected)							
\Box Create <u>n</u> ames for ranges of cells with errors							
Warning: Cannot check for circular references because Iteration is on							
Time out any sheet minutes							
Place documentation worksheet in: \$XT_(1) EX1DEMO.xlsx							
<u>O</u> K <u>C</u> ancel							

If you check the first option, it will process all the worksheets in the workbook. If you leave it unchecked, it will process only the selected sheets. You can select multiple sheets by Ctrl+click on each tab you want to include in the selection. Or, by selecting one sheet tab, holding down the Shift key, and selecting another tab, you can select a group of sheets at once. This can be a useful way to include a set of sheets that you want to test, or to exclude a sheet containing nothing more of interest than a large table of data. For this exercise, leave the first option unchecked. Because the active sheet is 'Errors', this creates a sheet *Errors* in the \$XT_ workbook which summarises the warnings on the sheet. The "Areas" column contains hyperlinks to the cells, or if 'Create names' was checked, to a named range referring to the cells. Each cell across contains the full address of the area and you can use the XLTest shortcut Right-Click+5 to go to that area. If you do not see the numbered XLTest options in the cell context menu, use the Shortcut Keys menu option 'Refresh Right-click menu'.

If Iteration is on, a warning appears that it cannot check for circular references. If you wish to include that check, please first uncheck "Enable iterative calculations" in the Excel Options.

The option to time out the inspection is useful for workbooks that may have large worksheets that you do not wish to analyse completely. Leave it blank for no timeout. The sheet lists the #Error values, the error and warnings checks, some formula statistics, a list of functions used, any circular reference chain, the number formats in use, custom styles, and the comments (cell notes) on that sheet.

Most tests in XLTEST add a text box to the original sheet which hyperlinks to the documentation sheet. This screenshot shows four such links (Info, Numberformats, Conditional Formats, and Formulas), and the screen tip for the first one, \$Inf.



Errors and warning checks

Description of check Error value

The cell contains...

an error value, one of: #DIV/0!, #N/A, #NAME?, #NULL!, #NUM!, #REF!, #VALUE! #SPILL!, #CONNECT!, #BLOCKED!, #UNKNOWN!, #FIELD!, #CALC! Excel 2019 adds #SPILL! and other error values Text two digit year a text date with 2 digit years Number stored as text a number stored as text Inconsistent formula an inconsistent formula for a region Omits cells in region a formula omitting a cell for a region Unlocked formula cell a formula and is unlocked a formula referring to empty cells Refers to empty cell data in the list contains a validation error List validation error Inconsistent list an inconsistent formula for a list Fails data validation a validation error Overflow error an overflow error Number in formula an embedded ('hard coded') numeric constant NumberFormat hides value number format obscures real value Format Font Fill colour font colour same as cell fill colour **Conditional Format Font** font conditional colour same as cell fill colour Formula too long formula exceeds 1024 characters Formula starts with minus formula begins =-Formula with double minus formula contains -numeric text aligned to look like a number Numeric text right aligned Range Lookup check params a lookup function missing the range lookup parameter Formula #REF but not error a formula contains #REF but does not return an error

This is followed by other checks: Cells Checked; Not empty; All Formulas; Distinct Formulas; External Link Formulas; Formula Hidden; Formula Unlocked; Max Formula Length; Max Formula Complexity; Total Formula Complexity; Array Formulas; Object formulas; Merged Areas; Number Formats used; Custom Styles used; Circular Reference.

After that, there is a list of Excel functions used, number formats used, cell comments, and hyperlinks.

If you checked "Create names for ranges of cells with errors", range names are created corresponding to the entries in the 'Description of check' column in the table above. This provides a convenient way to select all the cells in a particular class of error.

A30	
Array Regions	
Err_DIV	mqf
Err_NA	ck
Err_NAME	
_Err_NULL	(1)
_Err_NUM	
_Err_REF	
_Err_VALUE	
_Error_value	
_Formula_starts_w	
_Number_in_formu	il i
_Overflow_error	hant?
_Refers_to_empty_	nent

Not all of these warnings are necessarily real errors. For example, although constant numbers in formulas are not good practice if they represent numbers which might change, the VLOOKUP function will usually have a numeric constant in it which is the number of the column to be returned, eg =VLOOKUP (A4, TaxTable, 7, FALSE).

Each of the areas found for each error is listed across the sheet:

No.	Error Check	Count	Areas		Ranges							
	1 Error value	1	0	6	S]Errors!B11	S)Errors!B	313	ors/B15:B17	ors/B21:B23	BJErrors D23	SjErrors B25	5
	2 Text two digit year											
	3 Number stored as text											
	4 Inconsistent formula											
	5 Omits cells in region											
	6 Unlocked formula cell											
	7 Refers to empty cell		4	4	SjErrors B16	SjErrorsle	322	SIErrors D23	S)Errors B27			
	8 List validation error											
	9 Inconsistent list											
	10 Fails data validation											
	11 Overflow error		1	1	S Errors B5							
	12 Number in formula		5	3	SJErrors B11	ors B20:B	321	ors/C21:D21				
	13 NumberFormat hides value											
	14 Format Font Fill colour											
	15 Conditional Format Font											
	16 Formula too long											
	17 Formula starts with minus		1	1	S[Errors B5							
	18 Formula with double minus											
	19 Numeric text right aligned											
	20 Range Lookup check params		3	1	ors/B15:B17							
	21 Formula #REF but not error											
	21 Formula #REF but not error											

The sheet name is shown in a lighter colour in order to make the cell address stand out better. The right-click '5 GoTo Reference' shortcut works on these cells even though they are not hyperlinked.

Styles and Conditional Formats

List Colour Formats and Styles

In the Batch Test menu, this is done by the option 'Colour Styles, Numberformats, Conditional formats from above lists' which uses the previously derived lists to identify the cells to be coloured.

Formats and Styles	×
All 4 Worksheets (uncheck to do 1 selected)	
Colour code cells by format type	
Remove Conditional Formatting and Styles	
Styles, Numberformats, Conditional Formats will be cleared before colouring the sheets	
Colouring method	
C All (saves copy workbook for each)	
C <u>S</u> tyles	
C Number formats	
C Conditional formats	
Place worksheets with lists of what was found in: \$XT_(4) EX1DEMO.xlsx	
Time out any sheet after 10 minutes	
<u>O</u> K <u>C</u> ancel	

This enables you to see differences in the otherwise non-obvious formulas behind conditional formatting.

Because Conditional Formats typically have fill colours, there is an option to remove them <u>after</u> creating the sheet that lists them and before adding the XLTest colour scheme which assigns a distinct colour to each conditional format formula. So, ensure you use this menu option to document the CF colours <u>before</u> you remove them in any other XLTest colouring menu options.

In Batch mode, a copy of the workbook coloured by the Conditional formats is saved in a file "#Cof(1) EX1DEMO.XLS"; otherwise in a sheet in the \$XT file.

Formulas List, Colorize

List, Colour cells by distinct formula (R1C1)

Try this option on the sheet Budget08. Select all options except the first and click OK:

List, Colour Distinct Formulas (KICI)	-						
Process All 4 Worksheets (or 1 selected)							
Colour code cells by formula							
\square <u>R</u> emove Conditional Formatting and Styles							
There are no Conditional Formats in 'Budget08'							
✓ Use pale yellow for constant formulas							
Stripe and Border Link formulas							
Place worksheet with list of what was found in:							
Time out any sheet after 10 minutes							
<u>O</u> K <u>C</u> ancel							

The option for *constant formulas* is for those cases when a sheet has formulas that are simply calculations like =1+2+3 with no cell references. Rather than treating each one as a different formula, this assigns the same pale yellow colour to them all. The *Stripe and Border link formulas* option shades cells with formulas that contain an exclamation mark (which might be an indication of workbook or external links) and puts a black border around cells with external links.

This creates a sheet in the documentation workbook named Budget08 that lists each formula in both R1C1 and A1 style and the areas it was found in. The first column has the colour assigned to it by XLTest. The FormulaA1 column also highlights in yellow some warning comments; for example, formulas with embedded constant numbers. In column G (not shown below) a picture of the worksheet provides an overview.

1	A	В	C	D	E	F	
1	Distinct Form	Formula R1C1 in 'Budget08'	Formula A1	Count	Areas	Ranges	
2	1	=Transfer!RC[-10]	L5=Transfer!B5	47	6	[EX1DEMO XLS]Budget081L5:L10	[EX1DEN
3	2	=SUM(RC[-13]:RC[-1])	N5=SUM(A5:M5)	9	2	[EX1DEMO.XLS]Budget08IN5:N10	EX1DEM
4	3	=SUM(R[-6]C:R[-1]C)	B11=SUM(B5:B10)	13	1	[EX1DEMO.XLS]Budget08 B11:N11	
5	4	=SUM(R[-6]C[-13]:R[-2]C[-2])	O11=SUM(B5:M9)	1	1	[EX1DEMO XLS]Budget081011	
6	5	=R[-3]C+R[-2]C+R[-1]C	B17=B14+B15+B16	12	1	[EX1DEMO.XLS]Budget081B17:M17	
7	6	=SUM(R[-3]C:R[-1]C)	N17=SUM(N14:N16)	1	1	[EX1DEMO.XLS]Budget08[N17	
8	7	=SUM(R[-3]C[-13]:R[-1]C[-1])	O17=SUM(B14:N16)	1	1	[EX1DEMO.XLS]Budget08IO17	
9	8	=SUM(RC[-12]:RC[-1])	N20=SUM(B20:M20)	39	4	[EX1DEMO XLS]Budget08/N20:N26	[EX1DEM
10	9	=SUM(R[-7]C:R[-1]C)	B27=SUM(B20:B26)	25	2	[EX1DEMO.XLS]Budget08/B27:N27	[EX1DEM
11	10	=SUM(R[-7]C[-13]:R[-1]C[-2])	O27=SUM(B20:M26)	1	1	[EX1DEMO.XLS]Budget08/027	
12	11	=SUM(R[-6]C[-13]:R[-1]C[-2])	O37=SUM(B31:M36)	1	1	EX1DEMO.XLS]Budget08IO37	
13	12	=SUM(R[-8]C:R[-1]C)	B48=SUM(B40:B47)	11	1	[EX1DEMO_XLS]Budget08/B48:L48	
14	13	=SUM(R[-8]C:R[-2]C)	M48=SUM(M40:M46)	1	1	[EX1DEMO.XLS]Budget081M48	
15	14	=SUM(R[-8]C[-13]:R[-1]C[-1])	O48=SUM(B40:N47)	1	1	[EX1DEMO.XLS]Budget08/048	
16	15	=SUM(R[-16]C:R[-1]C)	B67=SUM(B51:B66)	12	2	EX1DEMO.XLS]Budget081B67	EX10EM
17	16	=SUM(R[-16]C[-13]:R[-1]C[-1])	O67=SUM(B51:N66)	1	1	[EX1DEMO XLS]Budget081067	
18	17	=R[-58]C+R[-52]C+R[-42]C+R[-32]C+R[-21]C+R[-2]C	B69=B11+B17+B27+B37+B48+B67	13	1	[EX1DEMO XLS]Budget08/B69:N69	
19	18	=SUM(R[-1]C[-12]:R[-1]C[-1])	N70=SUM(B69:M69)	1	1	[EX1DEMO_XLS]Budget081N70	
20	19	=SUM(R[-67]C[-13]:R[-3]C[-1])/2	O70=SUM(B3:N67)/2	1	1	[EX1DEMO.XLS]Budget08IO70	
1000							

The shade of colour used is not significant, except that unique formulas (those that occur only once on the sheet) are coloured in pure yellow. The colours paint the areas of the sheet with the same underlying formula, as you can see in the next picture of the Budget08 sheet after colouring:

XLTest

	EX1DEMO.XLS	[Read-Onl	y] [Co	mpatibil	lity Mod	e]									
	A	В	С	D	E	F	G	Н	T I	J	К	L	М	N	0
1 2 3 4	Colour by Dist \$XT_(2) EX1D	∻ tinct Formulas EMO.xlsx	эb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Check
5 6 7	Accounting Actuators	427 381	668 544 967	760 331 239	484 548	367 880 574 740	849 635 703	575 114 84 749	233 662 564	977 184 390	135 914 387	941 670 964	407 670 437	6807 6579 5690	
9	Advertising Air brakes	494	567 95	191	700	325	343	758	374	900 725	648 64	445 355	811	6556	
11 12	Total	2656	3381	2050	2727	3464	3996	2381	3711	4145	3124	3489	3179	38303	33040
13 14	Dept B Bags	394	608	392	76	77	268	753	616	240	871	153	408	4703	
15 16	Barcodes Batteries	352 931	644 593	714 485	982 149	692 862	239 358	711 279	894 993	377 342	616 464	304 104	457 237	6678 5693	
1/ 18 19	Lotal	1677	1845	1591	1207	1631	865	1/43	2503	959	1951	581	102	1/0/4	34148
20 21	Cables	398 0	172 861	471 550	924 581	803 547	242 28	422 616	219 234	431 251	859 476	184 500	989 982	6114 5626	
22 23	Cassettes Ceramics	348 555	543 618	697 622	94 514	320 971	189 573	353 976	75 792	350 115	259 223	494 935	428 306	4150 7191	
24 25	Chemical agent Chipboard	527 927	456 150	259 853	927 160	933 767	892 868	856 104	93 399	294 642	409 553	321 264	586 162	6553 5849	
26	Total	46 2801	328	805 4257	3350	1/4 4515	2901	126 3453	306 2118	419 2502	923 3702	3163	79 3532	3939	39422
20 29 30	Dept D												ľ		1
31 32	Dies Diggers	70 952	558 277	518 768	179 861	690 866	636 139	340 424	353 612	196 152	815 686	637 970	676 64	5718 6771	
33 34	Discs Doors	779 824	311 989	787 984	949 648	738 363	785 430	657 140	247 301	870 237	61 349	691 593	71 344	6946 6202	
35 36 37	Drums Dust covers	428 422 4120	384	39 952	724 849	778 101	167 175	165 507 2455	419 430	291 297 2994	/43 475	636	903	5259 6131 42769	27027
38	Dept E	4120		1000.	7200	1.1.44	ALL WEI F	6.700		2007		4400	COALL.	42105	UT DE I
40 41	Electric fencing Electric switchir	614 371	815 960	760 517	836 95	37 575	415 622	683 420	14 322	823 463	337 298	278 193	161 206	5773 5042	
42 43	Electronic medi Engines	810 469	966 374	603 921	909 890	462 968	262 791	554 230	174 663	137 923	625 718	231 425	753 516	6486 7889	
44 45 40	Environmental Events	925 859	292 46	289 600	40 214	536 88 660	561 378	787 268	467 655	771 354	388 946	403 695	489 192	5948 5295	
40 47 48	Extractors	251	871 5273	215	536	162	234	574	2960	46	952	2864	436	4452	93904
49 50	Dept F														
51 52	Factory cleaning Fast food	755 254	116 205	680 459	408 312	128 565	458 123	622 764	336 786	827 325	202 166	406 279	349 627	5287 4865	
53 54	Fastenings Fibre optics	559 192	698 407	423 104 660	723 287 242	262 870	351 848 512	696 378	405 673	603 181 701	767 990	308 308	820 654	7203	
56 57	Flags	685 461	484	701 190	506 744	961 255	140 788	53 7 664	470 177 826	50 765	422 594 990	459 735	597 323	5361	
58 59	Floor polish Flowers	147 893	878 135	494 244	223 986	666 117	376 268	788 449	546 633	478 685	660 696	256 13	320 452	5832 5569	
60 61	Fluid mixing Foam plastic	704 515	968 801	272 694	638 49	890 386	295 66	29 240	610 821	680 199	899 966	631 42	81 13	6697 4792	
62 63	Footwear Fortune telling	436 71	796 386	632 187	507 630	680 752	616 368	171 565	24 541	261 96	954 452	5555 63	939 203	6571 4332	
64 65	Fuel Fuel Furnishings	91 333	204 88 742	430 615 198	377 156 242	366 148 558	375 466 900	336 128 750	550 569	264 434 526	379 349 888	900 902	444 930	3554	
67 68	Total	7177		6986	7730	8466	6950	6640	8588	7075	10974	6914	7676	93046	186092
69 70	Grand total	22933	16965	23852	23734	25996	20515	20774	23163	21156	28318 G	21471 irand total	20964 check	230614 269841	527793.5

It is relatively easy to spot discrepancies in expected patterns this way, for example in N17, M48, N48 and C67. The unlocked formulas are given red borders.

Each colouring menu item (Formulas, Validation, etc.) puts its own colour scheme on the sheet, replacing any previous colour scheme. You might wish to print or save a copy of the workbook at each colouring stage if you wish to keep a record of the colouring. This is done automatically by the Batch processing menu.

It is recommended to use the menu item *Styles and Conditional Formats* first to document conditional formats before you decide to remove them.

Data Validation Formulas

List, Colour Data Validation Formulas

This lists Data Validation formulas and optionally gives cells with the same DV formula the same colour. Use the menu item first to document conditional formats before you remove them. Select the tab Budget08. In the Visualize and Document menu, click *Data Validation Formulas*



A sheet lists the formulas and the colours assigned to them.

	А	В	С	D	E	
1	Data Validatio	in 'Budget08'	Formula A1	Count	Areas	Ranges
2	1	Stop Decimal > 0	Stop Decimal > 0	102	<u>7</u>	B5:M9,L10,L14:L16,L2
3	2	Stop Decimal Between 0 1000	Stop Decimal Between 0 1000	33	2	B14:K16,M14:M16
4	3	Stop Decimal Between 0 980	Stop Decimal Between 0 980	407	<u>8</u>	B20:K26,M20:M26,B3

The sheet Budget08 is now coloured and the discrepancies are obvious. Cells where data validation has failed are outlined in red.



Colorize by Protection

List, colour by Protection and Hidden format

Colours by Protection format	\times
All 4 Worksheets (uncheck to do 1 selected)	
Colour by Protection	
<u>Remove Conditional Formatting and Styles</u>	
There are no Conditional Formats in 'Budget0	8'
Place worksheet with list of what was found in:	
\$XT_(4) EX1DEMO.xlsx	
\$XT_(4) EX1DEMO.xlsx Time out any sheet after 10	

This is intended as a visual check on the appropriate pattern of protection being applied to input cells (which should be unlocked) and calculation cells (which should be locked). The Locked and Hidden attributes of the Format Cells dialog Protection tab only take effect when the sheet is protected.

It applies the following colour scheme to the cells:

Type \ Protection	Lock, Unhid	Unlock,Unhid	Lock,Hid	Unlock,Hid
Empty	Pale Blue	Turquoise	Light Turquoise	Sky Blue
Constant	Tan	Yellow	Pale yellow	Light Orange
Formula	Lime	Bright Green	Light Green	Sea Green

And lists the ranges in the documentation workbook:

1	A	В	С	D	E	
1	Protection	in 'Budget08'	Formula A1	Count	Areas	Ranges
2	1	Locked ,Unhidden Constant		591	26	A1,B3:M3,O3,E
3	2	Locked ,Unhidden Empty		252	27	B1:M1,A2:M2,C 6,A28:M28,B25 68,O68:O69,A7
4	3	Unlocked, Unhidden Empty		15	8	N1:N2,N4,N12
5	4	Unlocked, Unhidden Constant		1	1	N3
6	5	Locked ,Unhidden Formula		137	21	L5:L10,B11:M1 ,B48:M48,O48,
7	6	Unlocked, Unhidden Formula		54	7	N5:N11,N14:N

Data Type and Usage

Colours cells by Data Type, Input, or Output

You can choose a simple scheme for text, numbers, dates, or logical values, or a more detailed scheme that distinguishes input values, intermediate and final calculations.

There is no need to manually remove any colouring from previous testing, it will be automatically removed. If you wish, you can use the menu item Decolorize Worksheets and check "Remove cell interior colours and patterns". You can use the menu item *Styles and Conditional Formats* first to document conditional formats before you decide to remove them.

Select the tab Budget08. In the Visualize and Document menu, click *Data Type and Usage* and you are asked:

Colour by data type and usage					
□ Process All 4 Worksheets (or 1 selected)					
✓ <u>R</u> ecalculate sheet before colouring					
Remove Conditional Formatting					
There are no Conditional Formats in 'Budget08'					
Colouring method Quick (Dates as numbers, not for large sheets)					
Normal (Numeric, Date, Text, Logical, Error)					
C Usage (distinguish input/output cells slower)					
(and gate appendix que tangende append					
Time out any sneet after in minutes					
<u>Q</u> K <u>C</u> ancel					

For the first exercise, accept the defaults, and you get:

A	В	C	D	E	F	G	н	1	J	K	L	M	N	0
Usage \ Type	Number	Date	Text	Logic	sal		-					1.000		-
Unused Constan	t White	White	White	Whit	te									
Input Constan	Light Green	Light Turquoi	Pale yellow	Pale lav	ender	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Check
Input Formula	Sea Green	Sky Blue	Tan	Lis	0			- C.						
5 termediate Formul	Lime	Pale Blue	light Orang	Laven	der (367	849	575	233	977	135	- 941	407	6807	
6 Output Formul	a Bright Gree	Turquoise	Yellow	Pin.	888	635	114	662	\$94	914	570	670	6579	
7 Empty input ce	Rose	Error	Plant		574	703	84	564	390	387	964	437	5690	
8 Adhesives	828	540	241	179	740	546	748	942	969	976	-214	485	7408	-
9 Advertising	494	567	191	700	325	343	758	374	900	648	445	811	6556	
0 Airbrakes	115	95	288	816	578	920	102	936	725	64	255	369	5263	
1 Total	2656	3381	2050	2727	8464	2996	2481	2711	4445	3124	3489	3175	38303	330
2			-	-			-	-	-					
3 Dept B				_										
A Bans	394	608	392	76	77	268	763	616	240	871	153	408	4703	-
Bucodes	352	644	714	982	692	239	711	894	377	616	324	457	6678	
Batteries	931	593	495	149	862	158	278	993	342	464	104	237	169	-
7 Total	1677	1945	1591	1287	1001	865	1743	2503	36.9	1951	581	1102	17074	241
8	and a				1000	000	100	2000		1000		1100		
Dant C														
Cabler	200	172	471	974	002	242	422	210	475	060	10.4	909	6114	-
Capitor Capitor	300	001	550	801	547	292	100	210	9.05	470		000		
Capacitors	240	840	000	0.4	220	100	0.0	604	201	970	204	304	1100	
2 Cassenes	340	040	007		471	870	303	700	300	200	8.04	920	710	
Chamical soore	000	0.90	066	914	974	973	210	196	112	409	200	305	100	
Chinhoud	927	100	053	100	707	000	204	200	642	EED	764	102	Read	
Computer cupit	10	220	005	100	174	100	100	200	410	922		75	1909	-
T Tatal	1001	1450	1267	100	40.00	29/1	140	300	100	1203	1000	26.20	10411	204
10.0					1010	1000	-				1999	10.00	1000	
Deet D				-	_	-		_	_			_		
in Dept D										_	724		-	-
I Dies	20	550	610	170	600	ene	240	969	110	015		670	8.740	
a Dissue	10	000	016	113	630	636	340	303	150	000	007	0/0	0/18	
2 Didas	302	211	707	040	700	705	929	012	070	600	570	71	5040	
Dista	113	311	101	010	000	100	007	297	870	240	001		6396	
Cools	624	505	009	704	303	400	140		231	343	2003	007	Columnation of the local data	
Crums	420	000	000	040	178	107	80	400	231	143	12	900	0408	
7 Tatal	922	201	302	043	101	110	007	+30	231	+/5	4460	303	4000	
a local	4120	0000	4066	12.00	44.02	2362	-2490	3663	2004	-2016	4468	2001	42789	-370
0 Dante				-										
Dept E			700						015	007		44.4	R. B. B.	-
Electric fencing	614	815	760	616	37	410	683	16	823	337	278	161	0773	
Electric Switchine	371	360	01/	30	0/0	622	420	322	463	298	100	206	504.	
Electronic media	810	366	603	909	462	262	004	1/4	137	625	231	753	5486	-
5 Engnes	469	374	361	830	268	731	2,0	663	323	/18	426	516	7889	-
4 Environmental	925	292	209	40	536	561	787	467	771	388	400	489	5948	
5 Events	859	46	600	214	88	378	268	655	354	946	685	192	5295	
6 Expenses	203	949	497	364	660	18	586	660	64	687	468	311	6067	_
7 Estractors	251	871	215	536	162	234	574	5	46	952	1710	436	4452	_
8 Total	4502	5273	4402	4484	3499	3281	4.92	2960	3583	4951	2884	2628		339
6														

The colour key is included on the page as a picture which you can move around as you wish.

As expected, the labels are text, most cells in the table are numbers, and the edges of the table have numeric formulas. When you move the colour key out of the way, you can see that cell E7 is empty (as are N48 & C67 when you scroll down); and L14:L16 contain text values. The formula in L17 treats these as numbers but the SUM formulas in N14:N16 ignore them.

For the second exercise, select Colour Data Type and Usage, select the Usage colouring method, and click OK. This is a slower process. Move the colour key to the right-hand side so that you can see the whole sheet:



Now you can see that E7 is empty and used in a formula; some labels are unused labels and some are included in the SUM formulas.

This is the colour key:

Usage \ Type	Number	Date	Text	Logical
Unused Constant	White	White	White	White
Input Constant	Light Green	Light Turquoise	Pale yellow	Pale lavender
Input Formula	Sea Green	Sky Blue	Tan	Lilac
Intermediate Formula	Lime	Pale Blue	Light Orange	Lavender
Output Formula	Bright Green	Turquoise	Yellow	Pink
Empty input cell	Rose	Error	Red	

This is what the usage terms mean:

Unused Constant	A constant that has no dependents, eg a label. White is also used for formulas with no dependents <i>and</i> no precedents such as =NOW() or a constant = $1+2+3$
Input Constant	A constant that has dependents.
Input Formula	A formula that has dependents but no precedents; for example =NOW() that is referred to by another formula.
Intermediate Formula	A formula that has both precedents and dependents; it is in the middle of a chain of calculation.
Output Formula	A formula that has precedents but no dependents; it is the final calculation result.
Empty input cell	A blank cell that has dependents.

Colouring by usage can be extremely slow on large sheets - it may take hours to do a sheet with 10,000 cells. The \$DOC sheet gives some rough timing estimates at the end of the sheet statistics, but these underestimate the time for large sheets.



Decolorize worksheets

Remove cell colours from worksheets

Prepare sheets for colouring	×				
Reset Palette, 0 Custom Colours					
☐ Delete 0 Custom <u>S</u> tyles					
□ Reset 47 <u>B</u> uiltin Styles to default					
□ <u>A</u> ll 4 Worksheets (uncheck to do 1 selected)					
Sheets will be unprotected and cells unmerged as necessary					
Remove cell interior colours and patterns					
Remove Conditional Formatting					
There are no Conditional Formats in 'Budget08'					
<u>O</u> K <u>C</u> ancel					

This option is also used to delete excessive Custom Styles.

In Excel 2007 and later, XLTest cannot determine the unused Styles because it would take too long.

This resets all cells on the active sheet or all worksheets to the default (clear) background. Try it on the Budget08 sheet you have just coloured. Check the box to "Remove cell interior colours and patterns".

It will ask you if you wish to clear colours set by Conditional Formatting, if any are detected. Use the menu item *Styles and Conditional Formats* first to document conditional formats before you remove them.

Colorize by Precedents

Colour by Precedents location

This can be extremely slow on very large sheets. To be accurate, precedent sheets should be visible, so you should run this after doing "Reset Settings, Unhide structure".

The option *Open..linked* will automatically open any external linked files so that precedents to them can be counted. If this is not checked, any formula with an exclamation mark will be counted as one precedent link. If you are working on the EX1DEMO.xls sample file, do not check this as a source is intentionally missing.

The option *Colour only cells referring to blank cells* is useful when you wish to identify only formulas where some precedent values may be missing. To see it the other way around – ie to identify blank cells being referred to by a formula, use the menu to colorize by Data Type and Usage and empty input cells are shown in pink.

Colour by Precedents Location						
Process <u>All</u> 4 Worksheets (or 1 selected)						
Remove Conditional Formatting						
There are no Conditional Formats in 'Budget08'						
☐ Open 1 linked workbooks (if not already open) ☐ Colour only cells referring to <u>b</u> lank cells						
Time out any sheet after 10 minutes						
<u>O</u> K <u>C</u> ancel						

Applying this to the Budget08 sheet, you get the sheet coloured and a colour key picture is copied to the sheet which you can move around:

Key to Prec/Depd
This sheet only
This workbook only
This sheet + book
External workbook
This sheet + Ext.
This book + Ext.
Sheet, book, Ext.

	8	8	- C	D	E	- F - 1	G	H		J	K	L	M	N	0
1	Key to Prec/De pd	98	Concer 1		- 10 - 1	20 00						10 11		12.20	
2	This sheet only														
3	This work book only	Jan	Feb	Mar	Apr	Mau	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Check
4	This sheet + book				30002502	1996.00			121122-0	20225					
5	External work book	411	668	760	484	367	849	575	233	977	135	941	407	6807	
6	This sheet + Ext.	427	544	331	548	880	635	114	662	184	914	670	670	6579	
7	This pook + Est	381	967	239	Grand	574	703	84	564	390	387	964	437	5690	
8	Steel oots, Est	828	540	241	179	740	546	748	942	969	976	214	485	7408	
9	Advertising	494	567	191	700	325	343	758	374	900	648	445	811	6556	
10	Airbrakes	115	95	288	816	578	920	102	936	725	64	255	369	5263	
11	Total	2656	3381	2050	2727	3464	3996	2381	3711	4145	3124	3489	3179	38303	33040
12	recor	2000	0001	2000	201 V X 4	0.01	0000	2001		inte	OILT	0100		00000	00010
13	Dent B														
4	Bans	394	608	392	76	77	268	753	616	240	871	153	408	4703	
5	Barcodes	352	644	714	982	692	239	711	894	377	616	324	457	6678	
6	Batteries	921	593	485	14.9	862	359	279	992	342	464	104	237	5692	
7	Total	1677	1945	1591	1207	1621	965	1742	2503	959	1951	591	1102	17074	2414.9
8	rotar	ion	1040	1001	1201	1001	000	11.40	2000	000	1001	001	102	11014	97179
19	Dept C														
20	Cabler	299	172	471	924	903	242	422	219	421	959	19.4	999	6114	
21	Capacitore	000	961	550	501	547	20	C1C	224	251	476	500	992	5626	
22	Capacitors	240	542	697	9.4	220	100	252	75	250	259	494	420 F	4150	
22	Cassettes	555	619	622	514	971	572	976	792	115	222	926	306	7191	
24	Chemical ager	527	456	259	927	922	092	950	92	294	409	221	596 7	6552	
26	Chinboard	927	150	062	100	767	0002	104	200	642	552	204	162	EOAG	
20	Computer cup	46	220	005	150	174	109	120	206	419	000	474	70	20220	
27	Total	2001	0100	4257	2250	4515	2901	2462	2110	2602	2702	0100	2622	20422	20422
	rotar	2001	5120	4201	0000	4010	2001	0400	2110	2002	0102	0100	0002	00422	00422
20	Dept D														
20	Dept D											776			
50	Dise	70	EEO	E10	170	600	000	240	959	100	015	007	070	E710	
21	Dies	050	000	700	001	000	100	404	010	150	010	001	CA P	0710	
24	Diggers	302	211	700	001	200	100	929	012	102	000	001	74	0010	
2.2	Deere	024	000	004	040	202	420	140	247	070	240	601	244 8	6346	
54	Doors	824	989	984	648	363	430	140	301	237	349	593	344	6202	
50	Drums	428	696	39	724	(18	167	165	419	291	/43	112	697	0259	
36	Dust covers	422	384	952	849	101	1/5	507	430	297	4/5	636	903	6131	07007
	LOIAL	41211	3338	4566	4/36	44.32	7522	2455	3283	2894	3616	4461	/84/	47769	37027

The green fill in column L means that it has precedents from another sheet.

To identify blank cells being referred to by formulas

To prepare an example for the next test, go to the sheet 'Transfer' and delete the contents of cell B59.

Now go to sheet Budget08, click "Colorize by Precedents", and select the option "Colour only cells referring to blank cells".

The cells on this sheet which refer to blanks on this sheet are highlighted in yellow and those which refer to blanks on the linked sheet 'Transfer' are highlighted in green.

49	Second and the second															
50	Dept F															
51	Factory cleanii	755	116	680	408	128	458	622	336	827	202	406	349	5287		
52	Fast food	254	205	459	312	565	123	764	786	325	166	279	627	4865		
53	Fastenings	559	698	423	723	262	351	696	405	603	767	896	820	7203		
54	Fibre optics	192	407	104	287	870	848	378	673	181	990	309	654	5893		Idea de DeselDe ed
55	Fish bait	395	222	663	342	862	512	53	470	701	422	735	792	6169		Key to Precibe pu
56	Flags	685	484	701	506	961	140	7	177	50	594	459	597	5361		This sheet only
57	Flavourings	461	690	190	744	255	788	664	826	765	990	736	323	7432		THIS HOW DOOK ONLY.
58	Floor polish	147	878	494	223	666	376	788	546	478	660	256	320 🗖	5832		External work book
59	Flowers	893	135	244	986	117	268	449	633	685	696	· 0	452	5558		This sheat . Evt
60	Fluid mixing	704	968	272	638	890	295	29	610	680	899	631	81	6697		This book + Fyr
61	Foam plastic	515	801	694	49	386	66	240	821	199	966	42	13 🖻	4792		Stepl north 211
62	Footwear	436	796	632	507	680	616	171	24	261	954	555	939	6571		PROPER ON THE CASE OF
63	Fortune telling	71	386	187	630	752	368	565	541	96	452	81	203	4332		
64	Franking	686	254	430	977	366	375	336	621	264	979	631	132	6051		
65	Fuel	91	88	615	156	148	466	128	550	434	349	85	444 🚩	3554		
66	Furnishings	333	742	198	242	558	900	750	569	526	888	802	930 🖻	7438		
67	Total	7177		6986	7730	8466	6950	6640	8588	7075	10974	6903	7676	93035	186070	
68	1000 TA 1000															
69	Grand total	22933 7	16965	23852	23734	25996	20515	20774	23163	21156	28318	21460	20964	230603		
70												Grand tota	l check 🏼 🍢	269830	527772	
71																

You can use the menu item *Styles and Conditional Formats* first to document conditional formats before you remove them.

Colorize by Dependents

Colour by Dependents location or count

This can be extremely slow on very large sheets. To be accurate, dependent sheets should be visible, so you should run this after doing "Reset Settings, Unhide structure".

This colours the cells according to either the location of the dependents, or the count of dependents at all levels. The options to create range names provide an easy way to select all the inputs on a sheet by range name. A further option creates range names for each data type – Blank, Number, Date, Text, Logical.

Try this on the sheet Budget08.

Colour Dependents									
Process All 4 Worksheets (or 1 selected)									
Create range names for Input Cells									
\square Separate names for Blank, Number, Text, Date, Logical									
Colouring Method									
 By location of dependents (same sheet, off-sheet) 									
C By count of all <u>d</u> ependents (slower)									
□ <u>B</u> order cells with off-sheet dependents									
Create sheet documenting names or count codes in									
Remove Conditional Formatting									
There are no Conditional Formats in 'Budget08'									
Time out any sheet after 10 minutes									
<u>Q</u> K <u>C</u> ancel									

First try selecting the option "By location", which shows that most of the cells (coloured yellow) are referred to only on the current sheet, the exception being the total (coloured green) in N70 which is referred to by the formula in E20 on the Errors sheet.

452	81	203	1000	
070		205	4332	
979	631	132	6051	
349	85	444	3554	
888	802	930	7438	
10974	6914	7676	93046	186092
28318	21471	20964	230614	
	Grand total	check	269841	527793.5
	349 888 10974 28318	349 85 888 802 10974 6914 28318 21471 Grand total	349 85 444 888 802 930 10974 6914 7676 28318 21471 20964 Grand total check 6	349 85 444 3554 888 802 930 7438 10974 6914 7676 93046 28318 21471 20964 230614 Grand total check 269841

If you checked "Create range names" and "Separate names", see the documentation sheet which shows the range names created:

Туре	Range Name	Count	Areas	Ranges
	AllInputs	859	30	A1:04,A5:
	0 Blankinputs	267	27	B1:01,A2:0
	5 NumericInputs	516	15	B5:K6,F7:k
	8 TextInputs	76	10	A1,B3:O3,

Then try again, check the option "By count" and check "Border cells". If you check "Remove Conditional Formatting" it will show that there are none on Budget08. For other sheets, you can use the menu item *Styles and Conditional Formats* first to document conditional formats before you remove them.

Colour Dependents											
Process <u>All</u> worksheets (could be lengthy)											
✓ Create range names for Input Cells											
Separate names for Blank, Number, Text, Date, Logical											
Colouring Method											
○ By location of dependents (same sheet, off-sheet)											
• By count of all dependents (slower)											
☑ Border cells with off-sheet dependents											
Create sheet documenting names or count codes in											
\$XT_(1) EX 1DEMO, xls											
Remove Conditional Formatting											
There are no Conditional Formats in 'Budget08'											
Time out any sheet after 10 minutes											
OK											

You get a colour key sheet like this:

	А	В	С	D	Е	F
1	No.	Dependents in 'Budget08'	External	Count		
2	1	1		185	<u>11</u>	B3:N4,A5:A10,B12:N13,A14:A16,B18:N19,B28:N2
						B5:M9,B14:M16,B20:M26,B31:M36,B40:M46,B47
3	2	4		523	<u>8</u>	:L47,B51:B66,D51:M66
						N5:N10,B11:N11,B17:N17,N20:N26,B27:N27,N37
4	3	2		87	<u>9</u>	,N40:N47,B48:N48,B67:N67
						B10:M10,N14:N16,B30:M30,B37:M37,M47,C51:C
5	4	3		72	7	66,N51:N66

And the Budget08 sheet now shows the differing usage of the data:

	A	В	С	D	'N	F	G	Н		J	К	L	М	N	0
1	Budget for 200	Ø													
2		Jan	Feb	Mar	Anr	Mau	Jun	dul	Aua	Sen	Oct	Nov	Dec	Total	Check
4	Dept A														
5	Abrasives	411	668	760	484	367	849	575	233	977	135	941	407	6807	
7	Accounting	427	967	239	548	880 574	535 703	114 84	564	184	314	964	437	5690	
8	Adhesives	828	540	241	179	740	546	748	942	969	976	214	485	7408	
9	Advertising	494	567	191	700	325	343	758	374	900	648	445	811	6556	
10	Air brakes	115	95	288	816	578	920	102	936	725	64	255	369	5263	·
11	Total	2656	3381	20501	2727	3464	3996	2381	3711	4145	3124	3489	31/91	38303	33040
13	Dept B														
14	Bags	394	608	392	76	77	268	753	616	240	871	153	408	4703	
15	Barcodes	352	644	714	982	692	239	711	894	377	616	324	457	6678	
17	Total	931	593 1845	485	149	1631	358	279	2503	34Z 959	464	104 581	1102	5693 17074	34148
18	, oldi	1011	1040	1001	1201	1001	000	1140	2000	000	1001	001	1102	11014	04140
19	Dept C														
20	Cables	398	172	471	924	803	242	422	219	431	859	184	989	6114	
22	Capacitors Cassettes	348	543	000 697	94	320	28 189	353	234 75	201	476 259	200	382 428	2626	
23	Ceramics	555	618	622	514	971	573	976	792	115	223	926	306	7191	
24	Chemical agent	527	456	259	927	933	892	856	93	294	409	321	586	6553	
25	Chipboard	927	150	853	160	767	868	104	399	642	553	264	162	5849	
26	Lomputer supp	46 2801	328	805 4257	3350	4515	2901	3453	2118	2502	3702	474	3532	3939	39422
28	1 oldi	2001	0120	4201	0000	4010	2001	0400	2110	2002	0102	0100	0002	00422	00422
29	Dept D														
30	Dies	70	559	519	179	690	636	340	353	196	915	697	676	5719	
32	Diagers	952	277	768	861	866	139	424	612	152	686	970	64	6771	
33	Discs	779	311	787	949	738	785	657	247	870	61	691	71	6946	
34	Doors	824	989	984	648	363	430	140	301	237	349	593	344	6202	
35	Drums	428	696 204	39	724	778	167	165 507	419	291	743	112	697	5259	
37	Total	4120	3338	4566	4236	4432	2522	2455	3283	2894	3616	4460	2847	42769	37027
38															
39	Dept E	C14	015	700	000	27	415	000	14	000	227	270	101	5770	
40	Electric rencing	371	960	760 517	95	575	622	420	322	463	298	270	206	5042	
42	Electronic medi	810	966	603	909	462	262	554	174	137	625	231	753	6486	
43	Engines	469	374	921	890	968	791	230	663	923	718	426	516	7889	
44	Environmental	925	292	289	40	536	561 270	787	467	771 254	388	403	489	5948	
45	Expenses	203	949	497	964	660	378	586	660	64	687	468	311	6067	
47	Extractors	251	871	215	536	162	234	574	5	46	952	170	436	4452	
48	Total	4502	5273	4402	4484	3488	3281	4102	2960	3581	4951	2864	2628		93904
49	Dept F														
51	Factory cleaning	755	116	680	408	128	458	622	336	827	202	406	349	5287	
52	Fast food	254	205	459	312	565	123	764	786	325	166	279	627	4865	
53	Fastenings	559	698	423	723	262	351	696	405	603	767	896	820	7203	
54	Fibre optics Fish bait	192	407	104	287	870	848 512	378	673	181 701	990 422	309	554 792	5893 6169	
56	Flags	685	484	701	506	961	140	7	177	50	594	459	597	5361	
57	Flavourings	461	690	190	744	255	788	664	826	765	990	736	323	7432	
58	Floor polish	147	878	494	223	666	376	788	546	478	660	256	320	5832	
59	Flowers	893 704	135	244	636 636	117	268	449	633 E10	685 690	696.	E21	452	5569	
61	Foam plastic	515	801	694	49	386	255	240	821	199	966	42	13	4792	
62	Footwear	436	796	632	507	680	616	171	24	261	954	555	939	6571	
63	Fortune telling	71	386	187	630	752	368	565	541	96	452	81	203	4332	
64	Franking	686	254	430	977	366	375	336	621	264	979	631	132	6051	
66	Furnishinas	333	742	198	242	558	400	750	569	404	349	802	930	7438	
67	Total	7177		6986	7730	8466	6950	6640	8588	7075	10974	6914	7676	93046	186092
68	Construction	22022	10005	22052	22224	25000	20515	20774	20102	01150	20242	01471	20004	220044	
70	ciranci totai	223331	10303	23692	23734	20336	20515	20774	23163	21196	28318	2147 I Grand total	check	269841	527793.5

Note that the rose-coloured cells have 3 dependents but the tan-coloured ones 4, so you can see which cells are being omitted from some formulas. For example M47 is coloured rose because M48 only sums rows 40:46 whereas the other formulas in row 48 sum 40:47. C51:C66 are coloured rose because there is no SUM formula in C67.

Show Watch info

Show or hide Watch info on selection

This keeps a dialog open that updates as you select cells.

'Budget08'!R30C14		×
Full address	'Budget08'!N30	
Formula (len=13)	=SUM(B30:M30)	
Value:Numeric (len=4)	5742	
Style, Protection	Normal, Unlocked]
NumberFormat		
Alignment	Not aligned	
Font	Arial, Color 0, ColorIndex -4105(Automatic)]
Border	LineStyle -4142, Color 0, ColorIndex -4142(None)]
Fill	Pattern -4142, Color 0, ColorIndex -4142(None)	
Precedents:12	12 on this sheet	
Dependents:1	1 on this sheet]
In Name	Budget08!Print_Area]
Conditional Format		
Data Validation		
Error Checks	Unlocked formula cell NumberFormat hides value	
Comment		
Other information		
Copy to Clipboard	Close	

It gives you a convenient summary of the cell without having to use many Excel menus to find all the settings that apply to it.

The button 'Copy to Clipboard' copies the text shown in the dialog to the clipboard so you can paste it into any audit record document that you are working on.
Add \$TOC, Readme, Palette

Add Table of Contents, Readme, and Palette sheets

Add Table of Contents, ReadMe, Palette she	eets ×						
Select the doc sheets to add to the active workbook							
✓ Table of Sheet names with hyperlinks and Sum total							
✓ \$ <u>R</u> eadMe sheet with review checklist							
Colour Palette sheet showing 56 workbook colours							
<u>O</u> K	Cancel						

The \$TOC Table of Contents lists sheets and a hash total of their cells. This total may be useful in quickly seeing if reference sheets have changed between versions.

1	A	В	C	D	E	F	G	Н
1	Sheet	Туре	Sheet Tab Name	Visibility	Contents	Sum Total	Rows	Columns
2	1	Worksheet	Data	Visible	Client	8097426.755	73	15
3	2	Worksheet	Errors	Visible	A compendium of error values	#VALUE!	30	5
4	3	Worksheet	\$Readme	Visible	Read me first to understand this spreadsheet	0	25	5
5	4	Worksheet	Budget08	Visible	Budget for 2008	2777309.5	70	15
6	5	Worksheet	Transfer	Very Hidden	November 2008	63832	69	2
7	6	Worksheet	\$Palette	Visible	Palette	971439460	59	12
8	7	Worksheet	\$TOC	Visible				

If the workbook already has sheets named '\$TOC', '\$Palette', or '\$Readme', they will not be overwritten; another sheet will be added with a (1) suffix.

The '\$Readme' sheet can help you remember the things to check before distribution, and to record the checking activities.

쳌	EXIDEMO.XLS					
	A	В	С	D	E	F
1	Read me first to understand this spreadsheet					
2	Purpose					1
3	Requirements					
4		Version no.	Date	By whom	Comments / filename etc	
5	Current release and version					
6	Previous versions (insert lines for future versions here)					
7						
8	Properties				See \$DOC sheet	
9	Notes on any unusual features, eg settings, functions, features, hidden structure, macros				See \$DOC sheet	
10	Instructions for regular usage				See Instructions sheet / document	
11	Calculation methods, units of measure, currencies, references to source documents					
12	Conventions on the meaning of formatting and styles	Input number	Output number			
13						
14						
15	How to find your way around this workbook				See \$DOC sheet	
16	Name of person who maintains list of authorised passwords for sheet and VBProject access					
17	Name of sheet that contains definitions of constants and assumptions				See \$DOC sheet	
18	List of automated data sources (text files, workbooks, data queries)				See \$DOC sheet	
19	Verified that the spreadsheet conforms to guidelines of data					
20	Reviewed for formula accuracy by and when:		-	-		_
21	Source data verified as accurate and complete by and when			-		
22	Output data and chart results last tested and verified by and when:				(insert name of workbook containing pro	of en expected
23	Date last printed and circulated to				Anset chance of workbook containing pro	o, es expected i
24	Statement of regulatory compliance					
25	Chatery and of accordibility compliance			-		

The 'Palette' sheet tells you whether a workbook has a non-standard colour palette, which would change the colouring schemes that XLTest creates. To reset the palette to the Excel default set of 56 (of course, do this on a copy of the workbook for testing) on the Tools menu, click Options, click the Color tab and then click Reset.

	A	В	C	D	E	F	G	Н	L.	J	K	L	
1		Standard Ex	cel Colo	ur Pa	alette			This workbook		ook colour palette			
2	ColorIndex	Name	Color	Red	Green	Blue	Sample	Sample	Color	Red	Green	Blue	
3	1	Black	0	0	0	0		<u>من م</u>	0	0	0	0	
4	2	White	16777215	255	255	255	2	2	16777215	255	255	255	
5	3	Red	255	255	0	0	3	3	255	255	0	0	
6	4	Bright Green	65280	0	255	0	4	- 4	65280	0	255	0	
7	5	Blue	16711680	0	0	255	- 5	5	16711680	0	0	255	
8	6	Yellow	65535	255	255	0	6	6	65535	255	255	0	
9	7	Pink	16711935	255	0	255	7	7	16711935	255	0	255	
10	8	Turquoise	16776960	0	255	255	8	8	16776960	0	255	255	
11	9	Dark Red	128	128	0	0	9		128	128	0	0	
12	10	Green	32768	0	128	0	10	10	32768	0	128	0	
13	11	Dark Blue	8388608	0	0	128	1		8388608	0	0	128	
14	12	Dark Yellow	32896	128	128	0	12	12	32896	128	128	0	
15	13	Violet	8388736	128	0	128	13		8388736	128	0	128	
16	14	Teal	8421376	0	128	128	14	14	8421376	0	128	128	
17	15	Gray-25%	12632256	192	192	192	15	15	12632256	192	192	192	
18	16	Gray-50%	8421504	128	128	128	16	16	8421504	128	128	128	
19	17	Lilac	16751001	153	153	255	17	17	16751001	153	153	255	
20	18	Plum	6697881	153	51	102	18	18	6697881	153	51	102	
21	19	Pale yellow	13434879	255	255	204	19	19	13434879	255	255	204	
22	20	Light Turquoise	16777164	204	255	255	20	20	16777164	204	255	255	
23	21	Dark plum	6684774	102	0	102	21	21	6684774	102	0	102	
24	22	RosyTan	8421631	255	128	128	22	22	8421631	255	128	128	
25	23	Mid blue	13395456	0	102	204	23	23	13395456	0	102	204	
26	24	Pale lavender	16764108	204	204	255	24	24	16764108	204	204	255	
27	25	Dark Blue	8388608	0	0	128			8388608	0	0	128	
28	26	Pink	16711935	255	0	255	26	26	16711935	255	0	255	
29	27	Yellow	65535	255	255	0	27	27	65535	255	255	0	
30	28	Turquoise	16776960	0	255	255	28	28	16776960	0	255	255	
31	29	Violet	8388736	128	0	128	29	29	8388736	128	0	128	

Start > XLTest Options

Options saved for use in XLTest sessions

The first two boxes list the strings that will be reported in the *Detailed Inspection* menu option if any are found in formulas.

The "speed" option restricts XLTest tests to up to the last row and column with data, rather than Excel's used range which may be the entire sheet excessively formatted. You can turn off the option to "Check for Trust Access" if your group policy does not allow it.

ell <u>F</u> ormulas:	Database connection string	
INDIRECT(LOOKUP(MATCH(OFFSET(Provider=Microsoft.ACE.OLEDE	3.12.0;Data source=
IF("IF("IF GETPIVOTDATA(Separate database record for e	ach area in ranges analy <u>z</u> ed
	Other workbook Properties to repo	ort in analysis
eport if a sheet contains any of these in all <u>V</u> alues:	Property <u>1</u> name	Creation Date
Password confidential	Property <u>2</u> name	Last Save Time
error	Check for Trust Access to VB P VBA code is to be checked	roject each time
	For speed, test only the real us usedrange which may have exc	ed range rather than the Excel essive formatting
port any VBA line containing any of	✓ For speed, test only the real us usedrange which may have exc <u>T</u> ime out sheet colouring after (mir	ed range rather than the Excel essive formatting nutes) 10
eport any VBA line containing any of:	✓ For speed, test only the real us usedrange which may have exc <u>T</u> ime out sheet colouring after (mir Max. <u>n</u> umber of cells to check per	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576
eport any VBA line containing any of: error password Open	✓ For speed, test only the real us usedrange which may have exc <u>T</u> ime out sheet colouring after (mir Max. <u>n</u> umber of cells to check per M <u>a</u> x. number of areas to report per	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255
eport any VBA line containing any of: error password Open Save Data Source=	✓ For speed, test only the real us usedrange which may have exc <u>T</u> ime out sheet colouring after (mir Max. <u>n</u> umber of cells to check per <u>Max</u> . number of areas to report per <u>Debug</u> and Trace Logging Outp	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255 out
eport any VBA line containing any of: error password Open .Save Data Source= DDEInitiate MDB	 ✓ For speed, test only the real ususedrange which may have exc <u>T</u>ime out sheet colouring after (mir Max. <u>n</u>umber of cells to check per Max. number of areas to report per ✓ Debug and Trace Logging Outp ✓ VBE Immediate Window (Debug. 	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255 out Print)
eport any VBA line containing any of: error password Open .Save Data Source= DDEInitiate .MDB .ACCDB	For speed, test only the real us usedrange which may have exc Time out sheet colouring after (mir Max. number of cells to check per Max. number of areas to report per Debug and Trace Logging Outp	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255 out
eport any VBA line containing any of: error password Open .Save Data Source= DDEInitiate .MDB .ACCDB .XLS TXT	For speed, test only the real used usedrange which may have exc Time out sheet colouring after (min Max. number of cells to check per Max. number of areas to report per Debug and Trace Logging Outp VBE Immediate Window (Debug, Windows debugger output (Outpu Windows Event Tracing (cd0725	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255 out Print) tDebugString) i53-3166-46ab-a3de-e5f2595e02fb)
eport any VBA line containing any of: error password Open .Save Data Source= DDEInitiate .MDB .ACCDB .XLS .TXT	 ✓ For speed, test only the real usuedrange which may have excursion with the sector of the sector of	ed range rather than the Excel essive formatting nutes) 10 sheet 1048576 r sheet 255 out Print) tDebugString) 553-3166-46ab-a3de-e5f2595e02fb]

The Database connection string is used to specify where analysis results are to be saved to a database. The default is to save to an MS Access file XLTESTDB.ACCDB in the same folder as the XLTest add-in.

The two workbook properties (reported in the Scan Files analysis) give the date and time data stored by Excel internally in the workbook, rather than the filesystem date which may be changed when the file is copied to another device.

You can choose where to output XLTest debug messages and VBA profiler event trace output.

Start > Help / About XLTest

Help on colours and keyboard shortcuts

This displays the form shown below. It is non-modal so you can move it around and keep it in view while you work.

Colours for Data Types		00ikit (0) 2000	-20211 88161	k o Beine, Sy	Colours for counting	occurrences	
Usage \ Type	Num be r	Date	Text	Logical			Support, Updates, FAQs:
Unused Constan	White	White	White	White	0 1 2	4 5	Systems Modelling Ltd
Unused Const Formula	White	White	White	White	12 13 14 1	16 17	-
Input Constan	Light Green	Light Turquoise	Pale yellow	Pale lavender	18 19 20 2	22	
Input Formula	Sea Green	Sky Blue	Tan	Lilac	24 25 26 2 30 31 32 3	28 29	
Intermediate Formula	Lime	Pale Blue	Light Orange	Lavender			
Output Formula	Bright Green	Turquoise	Yellow	Pink	L		1
Empty input cel	Rose	Error	Red				
Ctrl+\ Ctrl+Space Ctrl+Shift+ Ctrl+Shift+{ Ctrl+Shift+{ Ctrl+Shift+}	n a selected i Select Columi n a selected o Select all cells Select all cells Select cells th Select cells th	row, select cells n column, select o s directly refere directly or indi- tat directly or indi- tat directly or indi-	that don't ma cells that don' nced by formurectly referen ence the active directly referen	atch the value in It match the valu ulas in the select ced by formulas ve cell. ence the active	n the active cell. ue in the active cell. ttion. s in the selection. cell.	Numeric: TextToVi GetForm JoinValu SumN(ra FileSize DateMoo DirFile(f	s(text) alue(text, [minus], [decimal]) ula(cell) es(range, delimiter) ange) (filename) jified(filename) ileno, dirname, [attrib])
To select cells by c e.g. to find sheet lin In the Look In box, s Close the Find dialo	ontent, use C ks, enter ! int select Formula og and you ca	trl+F to Find o the Find Wha as. Click Find A n tab around th XLTest	t box. To find II. Press Ctrl+ e selected ce 171 Click to	external links e A to select all te ells. D read License	enter [or .xls he cells.		Close

The box on the right shows the functions in XLTest that are available for you to use in your own formulas, as long as the XLTest add-in is installed.

You can access the right-click shortcuts using the keyboard; the key looks like this:



Click the text box at the bottom to read the license agreement. It is also at the end of this document.

Start > Batch process

Batch test selected or all sheets		×
F:DOCSVLTest2016/Ex1Demo/EX1DEMO.XLS Toggle All options Active sheet 'Transfer' Process All 4 Worksheets Automatically unprotect protected worksheets Place documentation worksheet in: \$XT_(4) EX1DEMO.xlsx Create \$DOC sheet listing everything Create \$INF detailed error checks 16s Save copy of coloured workbook for each map Save separate listing workbook for each map Save results in database User notes for audit record: The context of the co	 List Styles, Formats, Cond.Fmt. formulas Colour Styles, <u>N</u>umberformats, Conditional formats from above lists List and colour distinct <u>F</u>ormulas List and colour Data <u>V</u>alidation Formulas Colour by Data Type Colour by Protection Locked/Hidden The following methods may be increasingly slower with large files and may take more than ten times the estimated time. Colour by Data Type and Usage Colour by Precedents Location Colour by Dependents Count Colour by Dependents Location Estimated time for 2,433 cells in 4 Worksheet 	5s 8s 5s 6s 6s 52s 52s 52s 52s 52s 52s 52s 52
File unchanged since	Time out any sheet after 10 min	utes
<u>O</u> K <u>C</u> ancel		

This runs all the tests in sequence on all the sheets in the current workbook. Each option shows a rough estimate in seconds or minutes of how long it will take. It saves some effort running each XLTest menu option in turn but cannot save you the effort of actually reading the results! It saves a copy of the workbook under test for each colour map with a name created from the test and the file name, e.g. for the "Formulas List" option it creates "#For EX1DEMO.XLS" for the coloured workbook and "\$For EX1DEMO.XLS" for the coloured sheets. It also offers the option of copying a picture of each coloured sheet into its documentation sheet as shown here:

	0	6	D	L			. F.			G													3
Distinct For	r/Formula R1C1 in Budget08'	Formula A1	Count An	eas 5	lange	s			Building bis trent														
	1 =TransferfRC[-10]	1.5=TransfertB5	47	5				1.5:11	D. EXCLAND	721 151	JL14.1.16	1,000	COUND IS		1.20	1.26	(ICE)	2.01.11.11	1.3	01.35	- EXID	EUON	Librate
	2 =SUM(RC[-13]:RC[-1])	NS=SUW(A5 M5)	9	- 2				N5:N10	Contraction of the	(Change)	** N14 WG	1	sor Nen		·	64	1 08	e	Kt Hay		Dec	Total	CINCE
	3 = SUM(RI-6)C RI-1)C)	B11=SUM(B5 B10)	13	1				B11.N11	LT april 14	445		76.6		942	045	110	100	4070	134 2000		487		12
	4 =SUMIRI-61CI-130 RI-20CI-20	011=SUM/85 M9)	1	1				011	Annesiten	477		1000	Ast	800	1010	114	MCT.	104	314		670	1.22	-
	= DI. 70C+DI. 71C+DI. 11C	B17=B14+B15+B16	45	1				E17 1417	Antonian	100	947			87.2	202		-	200	347		477	1 22	
		N17-51 M(014-016)		-				1247	Allesive	128	542	341	179	740	545	748	942	909	374	100	482	74	
	 -Summing-Sternights 	017-0080194010		-				- N N	Admithing	454	987	194	700	325	242	758	374	900	048		811	20	
	c=snwlid-alcl-raitwl-ulcl-ulb	U17=SUM(B14:W16)		1				Inform Of	Ar trates	112		200	P 10	575	522		200	728	64	. a.	200	10	13
	8 =SUM(RC[-12]:RC[-1])	N20=SUM(B20 M20)	39	- 4				N20.N26	Tetal	2005	7581	2005	2127	2404	1000	2381	1711	4146	3124	2411	3179	383	13 3004
	=SUM(R(-7)C-R(-1)C)	B27=SUM(B20 B26)	25	- 2				B27.N21			837.M37	6											
1	0 =SUM(R[-7]C[-13];R[-1]C[-2])	027=5UM(820 M26)	1	1				hidgenhologi	Centil														
1	1 = SUMIRI-61CI-131:RI-11CI-21	037=SUME31.M36)	1	1				hidpenile O31	r dage	294	608	190	70	TT	284	288	d16	248	871 265		408	-43	19
1	=SUMIRLAIC-RL(IC)	FidR=SLM/Rab FI47)	.11	1				FI48-1.45	Barmoles	862	644	714	982	692	259	711	394	377	818 254		. 487		18
	1 -9 8400 810 01 00 200	AME-BIRAMAND MALCI	4	1					Ratio ins	821	200	400	142	862	268	279	202	342	404 304		237	50	12
	a -outping over any provide the	CHR-CHRETHONNET		- 1				0.41	Total	1877.	1845	1001	1257	1621	005	1743	2600	000	1984	121	1182	178	4 3414
	- onwind-old-colid-colid-ch	DOT - DOM DAG THEY	49					0.00			men ser												
	a somilar televal-tiet	D6/=3UW(D51.006)	12	- 6				TO DO	Deel C. C. H. H.		01/10/11/07	in the second						- 100	1000 MMM	interest in			-
	a anwiet-reichtatiet-tict-tit	067=SUM(B51:N66)	1	1				hidpentel O6	Cathe	. 200	172	471	924	803	242	422	219	+21	829-21	100	202	<u>, 8</u>	
1	R[-58]C+R[-52]C+R[-42]C+R[-32]C+R[-21]C+R[-2]C	B69=B11+B17+B27+B37+B48+B67	13	1				E69:N68	Capaciton	0	901	109	per	- DAY	- 28	0.00	- 224	221	470	200	- 962	1 11	-
1	I =SUM[R[-1]C[-12]:R[-1]C[-1])	N7D=SUM(B69:M69)	1.	1				nopil05NN	Garren			100		800	100	252		300		102	- 10	8 2	
1	9 =SUMIRI-671CI-131-RI-31CI-11/2	070=SUMB3.N671/2	1	1				0/1	Caranno	100		1000	0.70	80.5	447		194	100	100	222	100	- 11	
	and the fet of the fet in a								Charlossingers		100	-	140	200	1010	0.00	-	845	447	100	147	1 22	
									Computer supplier		829	424	150	174	12.0	120	200	418	923		19		
									Total	-	-		100		-	100	1000				-		No.
									(upper			1						-					-
									Dent D														
									Date protectors	045	123	618	20	asio	190	2.22	821	\$.51	427	27.5	- 121	- 63	12
									Dies	70	558	015	179	690	606	3.40	363	190	810	181	670	87	
									Dippers	662	277	788	0.61	800	159	424	812	152	654	812	64	5 87	-
									Dece	1.19	311.	787	545	756	195	687	247	875			- 11	8 88	
									Doore	624	909	384.	540	302	400	540	301	297	348	384	244	62	12
									Drume	+20	994	28	724	279	167	+80	419	201	742	2002	407		
									Dust onvers	422	- 384	201	545	901	176	537	400	250	475.0000	0.655	- 903		Concession in which the
									Total					1000		2415	1.	10.00				- 422	18 . 3102
									Court F														
									Diedi E			ma.		-			- 14	4.44	*********	1000	101		-
									Entricit of the second			1120				200	-	- 100	- 100			1 2	
									Electronic media	610.		100	100	40	342	100	574	127	414		763	1 22	
									Entime	400	374	-0014	100	945	794	230	403	823	248		8.45	1 22	
									Environmental	828	282	28.9	40	650	081	787	407	TTT	388		488	2 13	12
									Erents	8.00	40	1000	214	86	378	258	655	354	940	10.0	152	8.8	10
									Expenses	203	543	-427	964	950	58	586	680	64	637		311	60	81
									Extractors	261	871	215	638	102	234	\$76	6	- 40	912	100	430	i 94	10
									Yotar	with the	6271	162	4424	1400	1208.1	100	2000	atori .	-	2904	28.28		8000
									Dispt #										and a balance			_	_
									Factory cleaning	765	110	780	+08	128	458	0.22	330	\$27	202		948	10	-
									Fast food	254	205	-69	312	505	123	766	79.0	325	100		627	- 19	
									Fasting	500	050	423	743	302	381	000	-40	600			620	1.	
									F tow optics	192	407	104	287	810	046	270	415	101	990		004	: 55	
									F-STI Dell	290		100.0	342	804	012	- 54	410	- 1977	424		140	5 Q	
									Fact		824	120	500	901	140		507	- 00	2344		1.100	1 3	
									P Brouvings	100	090	100	765	200	155	004	410	100	990		- 523	6 35	
									E bor polisis	800	134	1	100	117		140	100				- 530	100	-
									T101 milden	704	141		630	800	- 75.6		A10	600	000		100	200	
									Point dealers	615	801	22	-	38.0	-	245	821	100	444			4.9	
									Farmer	478	798	and .	807	100	618	171	24	200	1914		1.00		-
									Farture telling	21	305	167	630	752	268	5.65	541	98	452	100	203	4 41	10
									Franking	605	254	400	977	366	278	230	621	204	272	-	132	80	10
									Fuel	81	88	1018	158	148	400	128	560	434	348	145	444	50	
									Furnishing	333	742	168	242	103	805	760	M/H	108	888	102	830		-
									Total	7172	100	0365		1405	-0054	1240	8266	1075	10974	C214.	7576	800	19000
											_	1.1											
									General balai	2263	19961 2	1012	23734 3	22000	20111	2077A	22 10 1	211.00	2010	DATE.	2004	2144	
																			. Gra	nd house	1703	3044	1 5277.68

It may not be possible to process large workbooks automatically as Excel may run out of memory. The last four tests can be extremely slow on large sheets. Therefore a timeout is applied to each sheet to keep the batch time within reasonable limits.

Listing	Worksheets	Colour-coded copy workbook
Documentation	\$XT_	
Formulas	\$For	#For
Data Validation	\$Val	#Val
Data Type	\$Typ	#Typ
Data Type & Usage	\$Use	#Use
Styles, Formats	\$Sty	#Sty
Protection Formats	\$Prf	#Prf
Precedents Location	\$PrL	#PrL
Dependents Location	\$DpL	#DpL
Dependents Count	\$DpC	#DpC

Workbooks are saved for each type of sheet produced:

Because the folders for the saved copies are created in the same directory as the workbook, you need to have create permission in that directory – in other words, don't try this when the workbooks are on a CD or protected network location.

Test Cases menu

Introduction to Test Cases

XLTest can execute a set of test cases on a target workbook and stores the result of each test. You can use this for regression testing to verify that a new version performs the same as before, except of course for what you expect to have changed.

New Test Case Workbook

Create test case template

This creates a new workbook with a worksheet ready formatted with a test case skeleton for you to complete.

Comment		Test She	et	Test Cells	Test	Test Value
General comme	nt	ActiveSh	eet			
Set range B1:B3 t	to value 2			B1:B3	: Value Only	2
Set A4 to 3 and for	ormat shown			A4	@ Value and Format	3.00
Test whether C21	=21			C21	= Equals	21
Show value of exp	pression, no test	t		=SUM(D1:D3)	No test	
st						
sult Type test	Format test	Value test	Erro	ors		
	Comment General comme Set range B1:B3 f Set A4 to 3 and fo Test whether C21 Show value of exp st sult Type test	Comment General comment Set range B1:B3 to value 2 Set A4 to 3 and format shown Test whether C21=21 Show value of expression, no test st sult Type test Format test	Comment Test She General comment ActiveSh Set range B1:B3 to value 2 Set A4 to 3 and format shown Test whether C21=21 Show value of expression, no test Show value of expression, no test State st Sult Type test Format test Value test	Comment Test Sheet General comment ActiveSheet Set range B1:B3 to value 2 Set A4 to 3 and format shown Test whether C21=21 Show value of expression, no test Show value of expression, no test State st Sult Type test Format test Value test Error	Comment Test Sheet Test Cells General comment ActiveSheet Est Cells Set range B1:B3 to value 2 B1:B3 Set A4 to 3 and format shown A4 Test whether C21=21 C21 Show value of expression, no test =SUUM(D1:D3) st Type test Format test Value test Errors =	Comment Test Sheet Test Cells Test General comment ActiveSheet End of the state of the

Test cases can contain multiple inputs and output checks.

Meaning of the TestCases sheet columns and entries

Test Case	Name of test case
Comment	Any text comment on the test
Test Sheet	If blank, defaults to last used active sheet
Test Cells	The address of the cell, range, or range name to be input or tested
Test	The Test operation to be performed. Must be one of the following (only the first character is used)
	Blank or space the value of Test Cells is shown in Test Result but not checked against Test Value, which should also be left blank.
	: The Test Value is input into the Test Cells; the Test Result is expected to be the same as the input
	(a) The Test Value and Format are copied into the Test Cells; the Test Result is expected to be the same
	+, -, *, / The Test value is added, subtracted, multiplied, or divided into the Test Cells
	= The internal value of Test Cells is tested for exact equality with the Test Value
	\sim The display value of Test Cells is tested for equality with the Test Value display
	<, >,#, Comparison is Less than, Greater than, Not equal to.
Test Value	The value that you want compared to the Test Result; usually the expected result.
Before Change	For input Test Cells, this shows the value in the cell(s) before the Test Value was input
Test Result	The value of the Test Cells after the Test Value is input
Type test	A check that the data type of Test Value and Test Result are the same
Format test	A check that the cell format of Test Value and Test Result are the same
Value test	A check that the value of Test Value and Test Result are the same
Errors	Any errors found during test - for example data validation rules broken.

Run Test Cases

Apply test inputs and test results

This executes all the tests specified in the test worksheet.

XLTest first records the current value of the input cell in the Before Change cell. Then it inputs the Test value into the Test cells, which can be a single cell address, a range of cells or a range name. It records the actual content of the input cell in the Test Value cell. Then it reports whether the type, format, and value of the result cell are the same as specified in the Test Value cell.

As an exercise, open the demonstration TriangleFormula workbook supplied. This is a classical exercise in software testing: to test whether a function is returning the correct name for a type of triangle.

On the TriangleFormula sheet enter different values for the lengths of the three sides and decide whether you think the formula is correct. Then run the test cases contained in the TriangleTests worksheet and examine the results to see if there are some other conditions you could have tested. There are 99 test cases in this worksheet!

Run test cases		×
Open a workbook		
Workbook with test cases	TriangleFormula.xlsx	•
Worksheet with test cases	TriangleTests	•
Workbook to run tests on	TriangleFormula.xlsx	-
Default Worksheet if not specified	TriangleFormula	-
	<u>C</u> ancel	

Tests to Scenarios

Convert XLTest cases worksheet to Scenarios If you wish for any reason to create Excel Scenarios from XLTest cases, use this option.

Scenarios to Tests

Convert Excel Scenarios to XLTest case worksheet If you have a worksheet which has Excel Scenarios stored on it, use this option to convert them to XLTest test cases. The TriangleFormula sheet has 99 scenarios.

In the TriangleFormula workbook, activate the sheet 'TriangleFormula' and review the scenarios there (Data tab, What-If Analysis, Scenario Manager):

Scenario Manag	ger	?	×
Scenarios: S:1,Minimum Eq 6:2,Equilateral 7:3,Minimum Iso 8:3,Minimum Iso 9:3,Minimum Iso	uilateral	<u>A</u> dd Delet	 .e
10:4, Isosceles 11:4, Isosceles 12:4, Isosceles 13:5, Minimum S 14:5, Minimum S 15:5, Minimum S 16:5, Minimum S	calene calene calene calene	Edit Merge Summar	 .y
Changing cells: Comment:	\$F\$21:\$F\$23,Expected (1,1,1)=Equilateral		
	Show	Close	e

Compare Menu

5								
Compare	Test	Utilities	Workbook					
	Cases *	*	•					
<u>c</u>	ompare	two ce	lls					
17 18 → ← C	<u>o</u> mpare	worksh	neets					
y c	Compare workbooks							
D	uick Dif	f report	t					
Q c	ompare	VBA pi	ojects					

Compare two Cells

Compare two cells in detail

Click the dropdown of the Left and Right boxes to select the cells to compare. This lists the cell properties and, if a 'Compare characters' option is selected, each character of the cell contents. The rightmost column has an asterisk where there is a difference. This helps locate formatting or spelling differences.

	'[QBF.xisx]Test'!\$A\$2 _ Compare characters							
	'[QBF.xlsx]Test'1\$/	A\$4 _ C None	C None					
Compare	Copy	c Eormula C Eormula C Eormula C Eormula						
ess	'[QBF.xlsx]Test'l\$A\$2	'[QBF.xlsx]Test'l\$A\$4	4 Diffs					
	String	String						
ula Length	0	0						
e Length	44	44						
eongui	The quick brown fox jump	The quick brown fox jump	*					
ber Format	General	General						
ontal Alignmer	Centered	Left aligned, Indent 1						
ection	Locked	Locked						
Name	Arial	Arial						
Name	Normal	Normal						
ColorIndex	1	1						
Color Name	Black	Black						
or ColorIndex	-4142	-4142						
or Color Name	None	None -4142 -4142 -4142 None						
orPattern	-4142							
ersLineStyle	-4142							
ersColorIndex	-4142							
edents	None							
edent location:								
endents endent location litional Format	None	None						
Validation me		Invalid:Stop Length Betwe	•					
Checks ment		Fails data validation	•					
acter position	Character ASCII 32	Character ASCII 160						
	Compare ess ula Length ula e Length e Length e Contraction Name Color Name Color Name or ColorIndex Color Name or ColorIndex Color Name or ColorIndex edents edent location itional Format Validation ime Checks ment acter position	'[QBF.xlsx]Test'I\$, Compare Copy Q ess '[QBF.xlsx]Test'I\$, Q ess String U ula ess General ontal Alignmei Centered ction Locked Name Arial Name Normal ColorIndex 4142 ersColorIndex 4142 ersColorIndex 4142 ersColorIndex 4142 ersColorIndex 4142 ersColorIndex None indents None indent location None indent location None indent location None <td>TQBF.xisx[Test'!\$A\$2 _ Compare char TQBF.xisx[Test'!\$A\$4 _ Compare Compare Copy Close String String String ula Length 0 0 b The quick brown fox jump The quick brown fox jump Ontal Alignmei Centered Left aligned,Indent 1 ColorIndex 1 1 ColorIndex 1 1 ColorIndex 4142 -4142 or ColorIndex 4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex None None Indents None None Indent location: Invalid:Stop Length Betwe ment</td>	TQBF.xisx[Test'!\$A\$2 _ Compare char TQBF.xisx[Test'!\$A\$4 _ Compare Compare Copy Close String String String ula Length 0 0 b The quick brown fox jump The quick brown fox jump Ontal Alignmei Centered Left aligned,Indent 1 ColorIndex 1 1 ColorIndex 1 1 ColorIndex 4142 -4142 or ColorIndex 4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex -4142 -4142 ersColorIndex None None Indents None None Indent location: Invalid:Stop Length Betwe ment					

Compare worksheets

Compare two worksheets

You use this to find any differences in the cells, formulas, validation, and comments in two similar worksheets. As an exercise, we shall compare the Budget08 worksheet in EX1Demo.xls with the same named sheet in EX2Demo.xls. You could open them first in Excel, but we recommend using the dialog buttons which open a workbook read-only and without executing any Workbook_ Open macros. Use 'Left file...' to open EX1Demo.xls and 'Right file...' to open EX2Demo.xls. Then in the Compare menu of XLTest, click Compare Worksheets, check the options are as shown, and click Compare. XLTest creates a new workbook named like "\$WSC(1) Book1.xlsx" with a sheet named "Worksheet Comparison", and you should save that before clicking 'Compare'.

ft file	EX1DEMO.XLS	-
ft <u>s</u> heet	Budget08	•
nt file	EX2DEMO.XLS	•
t sheet	Budget08	-
	Maximum no. of differences	to report (max 999) 100
	Comparison options:	Colour cells that differ
	Formulas	Data validation
	Formula results	Conditional formats
	✓ Input values	Cell comments
	Data types	Cell interior colour
	Compare	Cancel

If there are more differences than the number specified in the Maximum Differences box (100), XLTest will pause and ask you if you want to stop the comparison. Click No, as in this case there are 102 differences.

Cell values are compared both by value and by visible display text. It shows the differences in both R1C1 and A1 reference style.

	A	В	С	D	E	F G	Н
1	Sheet	Address	Difference	R1/Value EX1DEMO.XLS	R1/Value EX2DEMO.XLS	- A1/Text EX1DEMO.XLS	A1/Text EX2DEMO.XLS
43	'Budget08'	N14	Value	4703	4856	4703	4856
44	'Budget08'	L15	Formula	=Transfer!RC[-10]	324	=Transfer!B15	324
45	'Budget08'	L15	Value	324	324	324	324
46	'Budget08'	L15	Validation result	False	True	False	True
47	'Budget08'	L15	Validation Formula	> 0	Between 0 1000	> 0	Between 0 1000
48	'Budget08'	N15	Value	6678	7002	6678	7002
49	'Budget08'	L16	Formula	=Transfer!RC[-10]	104	=Transfer!B16	104
50	'Budget08'	L16	Value	104	104	104	104
51	'Budget08'	L16	Validation result	False	True	False	True
52	'Budget08'	L16	Validation Formula	> 0	Between 0 1000	> 0	Between 0 1000
53	'Budget08'	N16	Value	5693	5797	5693	5797
54	'Budget08'	B17	Formula	=R[-3]C+R[-2]C+R[-1]C	=SUM(R[-3]C:R[-1]C)	=B14+B15+B16	=SUM(B14:B16)
55	'Budget08'	C17	Formula	=R[-3]C+R[-2]C+R[-1]C	=SUM(R[-3]C:R[-1]C)	=C14+C15+C16	=SUM(C14:C16)
56	'Budget08'	D17	Formula	=R[-3]C+R[-2]C+R[-1]C	=SUM(R[-3]C:R[-1]C)	=D14+D15+D16	=SUM(D14:D16)
57	'Budget08'	E17	Formula	=R[-3]C+R[-2]C+R[-1]C	=SUM(R[-3]C:R[-1]C)	=E14+E15+E16	=SUM(E14:E16)
58	'Budget08'	F17	Formula	=R[-3]C+R[-2]C+R[-1]C	=SUM(R[-3]C:R[-1]C)	=F14+F15+F16	=SUM(F14:F16)
70	10. Jan 100'	047	Farmela	-01 200 -01 200 -01 400	-0184/01 210-01 4101	-044-045-046	-010000000

If the option was taken to colour the worksheets, the cells that are different are colour coded in the original workbooks as follows:



A	B	C	D	E	F	G	н	1	J	K	L	M	N	0
Budget for	2008													
S														
1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Check
Dept A				0.25000	0.0000			1000 N.S.	6525					
Abrasive	411	668	760	484	367	849	575	233	977	135	941	407	6807	
Account	427	544	331	548	880	635	114	662	184	914	670	670	6579	
Actuator	381	967	239	500	574	703	84	564	390	387	964	437	6190	
Adhesive	828	540	241	179	740	546	748	942	969	976	214	485	7408	
Advertisi	494	567	191	700	325	343	758	374	900	648	445	811	6556	
0											255			
1 Total	2541	3286	1762	2411	2686	3076	2279	2775	3420	3060	3234	2810	33540	33540
2														
3 Dept B										100				
4 Bags	394	608	392	76	77	268	753	616	240	871	153	408	4856	
5 Barcode	352	644	714	982	692	239	711	894	377	616	324	457	7002	
6 Batteries	931	593	485	149	862	358	279	993	342	464	104	237	5797	
7 Total	1677	1845	1591	1207	1631	865	1743	2503	959	1951	581	1102	17655	35310
8														
9 Dept C														
0 Cables	398	172	471	924	803	242	422	219	431	859	164	989	6114	
1 Capacito	9	861	550	581	547	28	616	234	251	476	500	982	5635	
2 Cassette	348	543	697	94	320	189	353	75	350	259	494	428	4150	
3 Ceramic	555	618	622	514	971	573	976	792	115	223	926	306	7191	
4 Chemica	527	456	259	927	933	892	856	93	294	409	321	586	6553	
5 Chipboar	927	150	853	160	767	868	104	399	642	553	264	162	5849	
6 Compute	46	328	805	150	174	109	126	306	419	923	474	79"	3939	
7 Total	2810	3128	4257	3350	4515	2901	3453	2118	2502	3702	3163	3532	39431	39431

Compare workbooks

Compare two workbooks (same named sheets)

CompareWor	rkbooks	×					
	The result of the comparison will be placed in a new workbook						
Left file	EX1DEMO.XLS	-					
<u>R</u> ight file	EX2DEMO.XLS	_					
	Maximum no. of differences to	report (max 999) 100					
	Comparison options:	\checkmark Colour cells that differ					
	Formulas	Data validation					
	Formula results	Conditional formats					
	Input values	Cell comments					
	✓ Data types	Cell interior colour					
	VBA lines of code						
	Export VBA and run a Diff p	rogram					
<u>D</u> iff	C:\Program Files (x86)\WinMerge\WinMergeU.exe						
	C <u>o</u> mpare	Cancel					

This compares all the worksheets in the two workbooks selected. When you select this menu item, it first creates a report workbook (eg XLTEST_LOG.xlsx) with a sheet "Workbook Comparison" which you should save.

As an exercise, compare the files EX1Demo.xls and EX2Demo.xls. Do not use an Ex1Demo.xls file left open from previous exercises as it has been altered. Start with no workbook open. Use 'Left file...'to open EX1Demo.xls and 'Right file...'to open EX2Demo.xls. These buttons open a file read-only and without executing any Workbook_Open macros, which is recommended. If prompted for a password to unprotect a sheet, just click Ok for it to be done automatically.

XLTest also allows you to compare all the VBA code modules by exporting them to two directories created from the workbook name plus "_VBC" and then running a Diff utility, if you have one installed. Our recommended Diff utility is WinMerge, which is free. Use the [Diff...] button to select your preferred diff utility. Because the folders for the source code are created in the same directory as the workbook, you need to have create permission in that directory – in other words, don't try this when the workbooks are on a CD or protected network location.

Sample workbook comparison output:

1	A	8	C	D	E	F G
	Name	Туре	Difference	F:IDOCSIXLTest2016Ex1DemoiEX1DEMO.XLS	F:\DOCS\XLTest2016\Ex1Demo\EX2DEMO.XLS	
	Data	Worksheet Unprotected by "	-		Unprotected by ***	COMPARE
	Errors	Worksheet				Eorman Ver
	Errors		Formulas	19	14	Data validation: Yes
	Errors		Used Range	A1:E30	A1:D27	Input values: Yes
	Budget08	Worksheet				Cell comments: Yes
	Budget08		Formulas	191	144	VBA lines of rade: Yes
	Transfer	Worksheet	Sheet#4 is Not in Right file	Transfer		Colour pells that differ: Yes
Ŷ.			Sheet#4 is Not in Left file		PayNoAttention	Export VBA and run a Diff program: Yes
0	Last save t	im Document Properties	Value	15/09/2008 22:42:58	27/08/2008 11:27:07	Formula results: Yes
ř.	ImAddAD	acr LiperForm	Einst diff at line 5	Online Evolution	Drivata Sub forminad()	Data types: Yes
5	Modulat	Module	First diff at Inc 2	Ontion Explicit	Sub ShowEorm()	Conditional formats: Yes
5.	MUUUM	MIXING	Fills On at the 2	Let MortPymt1 = (Sisp1 - DnPymt1) * (((Rate1 / 12) * ((1 + Rate1 / 12) * (Time1 * 12))) / ((Rate1 / 12 + 1) * (Time1 * 12) -	Let MortPyrrt1 = [Sisp1 - DnPyrrt1)* (([Rate1 / 11)* ((1 + Rate1 / 12)* (Time1*12))) / ((Rate1 / 12 + 1)* (Time1*12) -	Cell interior colour
3	Module7	Module	First diff at line 68	1))	1))	
4	Sheet	Address	Difference	RC/Value EX1DEMO.XLS	RC/Value EX2DEMO.XLS	 A1/Text EX1DEMO.XLS
	1.76252	a second terms	100000000000000000000000000000000000000	2 Conditional Formats	2 Conditional Formats	2 Conditional Formats
				1) Stop < 14611 Interior Colorhdex=45(Light Orange)	1) Stop < 14611 Interior ColorIndex=45(Light Orange)	1) Stop < 14611 Interior ColorIndex=45(Light Orange)
5.	'Deta'	18	Conditional Formats	2) Stop > 43831 Interior ColorIndex-4(Bright Green)	2) Stop > 50000 Interior ColorIndex=4(Bright Green)	2) Stop > 43831 Interior ColorIndex=4(Bright Green)
6	Sheet	Address	Difference	RC/Value EX1DEMO.XLS	RC/Value EX2DEMO.XLS	- A1/Text EX1DEMO.XLS
7	'Errors'	C7	Input Value	1234-5678-9012-3456		1234-5678-9012-3456
8	Errors	C7	Type	String	Empty	
			.36.0	=VLOOKUP(RI-	=VLOOKUP(RI-	
				12IC /F /DOCS/XLTest2016/Ex1Demo/Is3errors.xlsIDisplays	12IC F IDOCS/POBSSQA/(s3errors xisID)splays/IR3C2 R10	+VLOOKUP/B3/F1DOCS/XLTest2016/Ex1Demoils3error
9	'Errors'	B15	Formula	'IR3C2 R10C3.0)	C3.0)	IsIDisplays7\$B\$3 \$C\$10.0)
				=VLOOKUP(R)-	=VLOOKUP(RI-	and the second
				12IC 'F IDOCSIXI Test2016/Ex1Demoils3errors visiDisplays	12IC F1DOCS/POBSSOA/(s3errors xtslDisplays/IR3C2 R10	=VLOOKUP(B4/F/DOCSXLTest2016/Ex1Demoils3error
n.	'Errors'	816	Formula	'IR3C2 R10C3 2)	(32)	IsIDisplays ISB\$3 SC\$10 2)
~	LINGIS	010	1 onnaia	=VLOOKUP/RL	=VLOOKUP/RL	olospajo abecodero,c/
				14IC 'F IDOCSIXI Test2016/Ex1Demo/Js3errors xisIDisplays	14IC F IDOCS/POBSSOAV/s/temors ats/Displays/IB3C2 B10	=VLOOKUP(B3/E)DOCS(X) Test2016(Ex1Demoils3error
4	'Enors'	B17	Formula	1B3C2-B10C3 3)	(33)	IsIDisplays ISB\$3 \$C\$10 3)
2	'Enors'	E10	Innut Valua	Total	63,31	Total
3	Enter	E10	Tura	String	Emply	
đ.	ennys.	5.10	1354	-VLOOKUP/Ball' 'E-DOCSWI Test2016/EvtDemois?ector	r odvi	=VLOOKUP/Balt*E/DOCSXITert2016/Er1Demois/arr
	Errore?	820	Eomada	< vie/Prinal let 2 EALSE #100	1234	c vic/Principlet 2 EALSEP100
5	Enors	820	Correda Danif	1000	1234	1000
4	LINKS	020	Putitian nesul	-SUM/E DOCSIXI Teet2018/Ev1Demo/JoBerrors visitoute/1	1234	-SLIME DOCSVI TeeP016/Ev1Demol/s3error skilnest
		Workbook Comparison	(A)	- TOMP A DAMAGE POWER COMPARING STREET	100	STATES AND A STATES AND A STATES AND A DATES AND A DAT

Winmerge screen shot:

🛞 WinMerge - [EX1DEMO_XLS_VB	WinMerge - [EX1DEMO_XLS_VBC\ - EX2DEMO_XLS_VBC\]									
🗀 Eile Edit View Merge To	ols <u>P</u> lu	gins <u>W</u> indow <u>H</u> elp		-	. 5	×				
🗋 🗎 🗟 📾 📾 📾 🛃 🧟	~ 5	🖌 🔀 🖉 🔶 🐗 🖗	🕺 🔝 📾 🛃	e e e e e e e e e e e e e e e e e e e						
EX1DEMO_XLS_VBC\ - EX2DEMO_XL	S_VBC\									
F:\DOCS\XLTest2010\Ex1Demo\EX1D	EMO_XL	S_VBC\ F:\	DOCS\XLTest2010\Ex1De	mo\EX2DEMO_XLS_VBC	X.					
Filename	Folder	Comparison result	Left Date	Right Date	Exter	nsion				
£										
Module7.bas		Text files are different	04/08/2016 14:43:33	04/08/2016 14:43:33	bas					
¹⁰ 01 frmAddARecord.frx		Binary files are different	04/08/2016 14:43:33	04/08/2016 14:43:33	frx					
frmAddARecord.frm		Text files are different	04/08/2016 14:43:33	04/08/2016 14:43:33	frm					
¹⁰ 01 frmExplainFormulaDirectory.frx		Binary files are different	04/08/2016 14:43:33	04/08/2016 14:43:33	frx					
frmExplainFormulaDirectory.frm		Text files are identical	04/08/2016 14:43:33	04/08/2016 14:43:33	frm					
Module1.bas		Text files are different	04/08/2016 14:43:33	04/08/2016 14:43:33	bas					
Sheet9.cls		Text files are identical	04/08/2016 14:43:32	* 04/08/2016 14:43:33	cls					
<							>			
1 item selected				*,*						
Elapsed time: 13 ms										

Double click on Module7.bas to see the code difference highlighted:

<pre> Est View Merge Tols Pupis Windsw Hdp Control Pupis Winds Hdp Control Pupi State Hoods/Tase FiDOCSVITestD0105410EM0/025/WECM6ds/Tase FiDOCSVITestD010541 View Win Inc e9 Ceb V133 Ch 1/133 View View View View View</pre>	WinMerge		- 0 X
Image: Section Press FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOLSTATE FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOLSTATE FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOCSULTest2010.5.10emolEXDEMO_X05.VEC.Module?has FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE FLOOLSTATE <t< th=""><th>ile Edit View Merg</th><th>e Iools Plugins Window Help</th><th></th></t<>	ile Edit View Merg	e Iools Plugins Window Help	
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Control Prime F-DOCSNUTestD000.5:00em/0427bas F-DOCSNUTestD000.5:00em/0427bas Else Else Else Else End If Else Else Else End If Else Else Else Tot Tot Else Else End If Else Else Else Tot Else Else Else Else Tot End If Else Else Else Else Tot Tot Else El	Module7.bas - Mod	Jule7.bas	
66 Else 67 Let Timel = Range("time1").Value 68 End If 69 Let MortPymtl = (Slspl - DnPymtl) * (((Ratel / 12) * ((I + Ratel / 12) * (Time1 * 12))) / ((Ratel / 12 + 1) * (Time1 * 12) - 1)) 1 Let MortPymtl = (Slspl - DnPymtl) * (((Ratel / 11) * ((I + Ratel / 12) * (Time1 * 12))) / ((Ratel / 12 + 1) * (Time1 * 12) - 1)) 1 Let MortPymtl = (Slspl - DnPymtl) * (((Ratel / 11) * ((I + Ratel / 12) * (Time1 * 12))) / ((Ratel / 12 + 1) * (Time1 * 12) - 1)) 1 Let MortPymtl = (Slspl - DnPymtl) * (((Ratel / 11) * ((I + Ratel / 12) * (Time1 * 12))) / ((Ratel / 12 + 1) * (Time1 * 12) - 1))	Location Pane	E\DOCS\XLTest2010\Ex1Demo\EX1DEMO_XLS_VBC\Module7.bas	F:\DOCS\XLTest2010\Ex1Demo\EX2DEMO_XLS_VBC\Module7.bas
69 Let MortPymt1 = (Sispl - DnPymt1) * (((Ratel / 12) / 0 / 71 / 71 / 71 / 71 / 71 / 71 / 71		66 Else 67 Let Time1 = Range ("time1").Value 68 End If	66 Else A 67 Let Time1 = Range ("time1").Value A 68 End If A
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Let MortPymtl = (Slspl - DnPymtl) * (((Ratel / 11) * ((1 + Ratel / 12) ^ (Timel * 12))) / ((Ratel / 12 + 1) ^ (Timel * 12) - 1))	Let Mo	ortFymtl = (Slsp1 - DnPymt1) * (((Ratel / 12) * ((1 + Ratel / 1	<pre>2) ^ (Time1 * 12))) / ((Rate1 / 12 + 1) ^ (Time1 * 12) - 1))</pre>
	Let Mo	ortPymtl = (81sp1 - DnPymtl) * (((Ratel / 11) * ((1 + Ratel / 1	2) ^ (Timel * 12))) / ((Ratel / 12 + 1) ^ (Timel * 12) - 1))
	Sec. 199 1 cm 11 5		

Comparison Functions callable from your code

You can call the XLTest macros from your own VBA code. This can help you create regression test suites to automatically compare versions of workbooks. The syntax is:

CompareWorkbooks(LeftWorkbook, RightWorkbook, ComparisonOutputWorksheet, MaximumDifferences, ColorDiffs, CompareFormulas, CompareResults, CompareValues, CompareTypes, CompareValidations, CompareConditionalFormats, CompareComments, CompareVBACode)

The function returns the number of differences found as a Double. LeftWorkbook and RightWorkbook can be either Workbook objects, or strings containing the name of an open workbook, or strings containing the full path and file name of a workbook to be opened. If ComparisonOutputWorksheet is Nothing, XLTest creates a new worksheet.

All arguments after the first three are optional. The default value for MaximumDifferences is 100, for the remainder is TRUE. The order of arguments is the same as the Comparison dialog.

Example

Debug.Print Application.Run("XLTest174.xlam!CompareWorkbooks", "C:\docs\Book1.xlsx", "C:\docs\Book2.xlsx").

Similarly, there is a function to compare two worksheets:

```
CompareWorksheets(LeftWorksheet, RightWorksheet,
ComparisonOutputWorksheet, MaximumDifferences, ColorDiffs,
CompareFormulas, CompareResults, CompareValues, CompareTypes,
CompareValidations, CompareConditionalFormats,
CompareComments)
```

The function returns the number of differences found as a Double.

Quick Diff report

This is a fast comparison that takes a simple approach which may be suitable for quick comparisons between versions of a workbook. For this reason, it refers to the first file opened as the Previous version, and the second file as the Current version.



The differences are coloured in red in the Current version.

×	EX2DEMO.XLS [R	Read-Only] [Compa	atibility M	ode]								_		23
	A	В	С	D	E	F	G	Н	1	J	К	L	M	N	
1	Budget for 2008														
2															
3		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
4	Dept A														
5	Abrasives	411	668	760	484	367	849	575	233	977	135	941	407	6807	
6	Accounting	427	544	331	548	880	635	114	662	184	914	670	670	6579	
7	Actuators	381	967	239	500	574	703	84	564	390	387	964	437	5695	
8	Adhesives	828	540	241	179	740	546	748	942	969	976	214	485	7408	
9	Advertising	494	567	191	700	325	343	758	374	900	648	445	811	6556	
10	Air brakes	115	95	288	816	578	920	102	936	725	64	255	369 '	5263	
11	Total	2541	3286	1762	1916	2886	3076	2279	2775	3420	3060	3234	2810	33045	
12															
13	Dept B														
14	Bags	394	608	392	76	77	268	753	616	240	871	153	408	4856	
15	Barcodes	352	644	714	982	692	239	711	894	377	616	324	457	7002	
16	Batteries	931	593	485	149	862	358	279	993	342	464	104	237	5797	
17	Total	1677	1845	1591	1207	1631	865	1743	2503	959	1951	581	1102	17655	
18		_	_												Ŧ
H	Errors	Budge	t08 🦯 🐮	1/					I 4						1:

And summarised on a sheet:

	A	В	C	D	E	
1	Object	Name	EX1DEMO.XLS	EX2DEMO.XLS	Comparison	Th.
2	Cells	Errors		8	Changed	
3	Cells	Budget08		72	Changed	
4	Sheets	PayNoAttention		Sheet2	Added	
5	Sheets	Transfer	Sheet2		Deleted	
6	Module	frmAddARecord	[Line 4]Option Explicit	[Line 4]	Changed	
7	Module	Module1	[Line 1]Option Explicit	[Line 1]	Changed	
8	Module	Module7	[Line 67] Let MortPymt1 = (Slsp1 - DnPymt1)	[Line 67] Let MortPymt1 = (Slsp1 - DnPymt1)	Changed	
9	Linksources	F:\DOCS\POBSSQA\s3errors.		F:\DOCS\POBSSQA\s3errors.xls	Added	
10	Linksources	F:\DOCS\XLTest2007\Ex1dem	F:\DOCS\XLTest2007\Ex1demo\s3errors.xls		Deleted	
11						•
14 4	Previo	us_to_Current_Comparison 🦯 😓 🤇			•	1

At the end you are asked if you want to compare the VBA modules:

Comparison Results
Compare: Previous: EX1DEMO.XLS Current: EX2DEMO.XLS 9 total differences found 3 lines of code different Export and Compare VBA Modules?
Yes <u>N</u> o

This outputs all the VBA code to one file for each workbook called eg Ex1Demo.nc and those two files are then compared. XLTest will use WinMerge if it finds it in the standard Program Files folder, otherwise it will use the DOS FC.EXE program which produces this kind of output in a file Diff VBProject.txt :



Compare VBA

This exports the two VBProjects to text files, one single text file per project, with the procedures sorted alphabetically, and runs Winmerge to compare them, as above. When you select this menu command it creates a temporary workbook to record the names of the files being compared.

If the code has been line numbered and one version renumbered differently, it may be useful to remove the leading line numbers to permit comparing just the code changes.

Export and comp	are all VBA code	×
	Select two workbooks	
Left file	EX 1DEMO.XLS	
Right file	EX2DEMO.XLS	
	Remove leading line numbers	
	Sort procedures	
Diff	C:\Program Files (x86)\WinMerge\WinMergeU.exe	
	Compare Cancel	

For an example of WinMerge output, see the Compare Workbooks menu item above.

Utilities Menu

Utilities Vorkbook Vorkbook Vorkbook Vorkbook Scan Files v Keys v Automatic Mem No Iteration
Remove secure Protection from XML
Toggle R1C1/A1
Show active Autofilter
Reset Text To Columns settings
Reset Excel status
Recalc Workbook
Recalc Sheets
Recalc Selection
Recalc <u>F</u> ormulas
Profile <u>V</u> BA code execution

Remove secure protection from XML

Remove workbook and worksheet protection

This strips out the workbook and worksheet passwords from the XML content of a workbook. It works on a closed file, not one open in Excel. It must be an OpenXML workbook such as .XLSX or .XLSM. It does not bypass the file open password, only the structure protection passwords. It replaces the original file so be sure you have a backup of the original in case any error happens.

Toggle R1C1 / A1

This toggles the display style of Excel between the normal A1 style where the column headings are letters to the numeric style where the columns are numbered and the cell references are in Row number & Column number style, where R1C1 is the same as A1. It is a slightly shorter action than the Excel menu File > Options > Formulas > R1C1 Reference Style.

	A	В	С		
7	Actuators	381	967		
8	Adhesives	828	540		
9	Advertising	494	567		
11	Total	2656	3381		

✓ f _x =SUM(R[-6]C:R[-1]C)							
EXIDEMO.XLS [Read-Only] [Compatibility Mo							
	1	2	3				
7	Actuators	381	967				
8	Adhesives	828	540				
9	Advertising	494	567				
11	Total	2656	3381				

Show active Autofilter

If the active sheet has an Autofilter, this shows the criteria in a simple message box. This may not work if there are many criteria applied.



Reset Text to Columns settings

Reset Excel's Text to Columns parsing

When you convert Text to Columns, Excel remembers the settings and applies them to the next Paste operation. That can result in the pasted text being split up in a way that you do not want. This option resets the settings to the default.

Reset Excel status

If XLTest is interrupted by an error, it may leave Excel in a manual calculation state and with some message on the status bar. This resets it to the default state.

Recalculate Workbook / Sheets / Selection / Formulas

These menu items recalculate the workbook selectively and report the timings. It is based on public domain code from Charles Williams on the Microsoft web site.

https://docs.microsoft.com/en-us/office/vba/excel/concepts/excel-performance/excelimproving-calcuation-performance

Calculatio	n	×
1	Rebuild Calculation: 0.01495 seconds Full Calculation: 0.00596 seconds Recalculation: 0.002441 seconds Volatility ratio: 2.441	
	OK	

Profile VBA code execution

Add tracing calls to profile VBA performance

This collects timing data on procedure calls, to produce profile statistics reports. It adds a one-line call to each procedure; and optionally to every line of code. It adds a reference to XLTest to collect the statistics on the calls.

Profiling EX1DEMO.XLS	×
This sets a reference in your project to XLTest. Profiling code will be added to every procedure in VBproject to collect execution time statistics.	your
To use it, create a test sub containing this code:	
Sub RunProfiler() ' @notrace XLTest.VBA_Profile_Initialize vbTab, ' Insert a call to your main procedur XLTest.VBA_Profile_Reports End Sub	ThisWorkbook re here
Trace every line of code for coverage analysis	
\Box Export all the VBA to a text file before changes	3
<u>Ok</u> <u>C</u> ancel <u>H</u>	elp

Click the Help button to learn more.

You can opt to export all the VBA to a text file before making the changes. This is just for your record, it is not used in this process. The tab-delimited text file is named from your workbook name suffixed with _VBA_BEFORE.TXT

It adds a line like the following to every procedure in the project, unless its declaration line contains a comment '@notrace

```
Dim P_ As Object: Set P_ = XLTest.New_Profiler():
P_.Start 12345, "modulename", "procname"
```

When the procedure exits and the variable P_ goes out of scope, the profiler adds one to the number of calls of this procedure and the length of time it took to run. The resolution of the timer is about a microsecond $(1 \ \mu s)$.

If you checked code coverage in the form, it inserts a call at the beginning of every executable line like this:

P_.O 12345&:

In the examples above 12345 is a unique line number in the project, corresponding to lines in the coverage file.

Finally you need to manually edit your code to insert a test sub to initialize the profiler, call the starting procedure, and then produce reports:

```
Sub RunProfiler() ' @notrace
    XLTest.VBA_Profile_Initialize vbTab, ThisWorkbook
    ' Insert a call to your main procedure here
    XLTest.VBA_Profile_Reports
End Sub
```

If the first parameter of VBA_Profile_Initialize is a delimiter such as a tab character (vbTab) or a comma (","), then every P_.Start sends the parameters to the debug logging output, separated by that character. The log output is set in XLTest Options, usually as either OutputDebugString (c. 20 μ s) or Event Tracing events (c. 1 μ s each) You can watch and capture that output using DebugView from SysInternals or TraceSpy from Simon Mourier. I use TraceSpy because it is faster than DbgView and did not miss any output in fast tests. To be sure that TraceSpy can keep up with the output, do not use Auto-Scroll.To have no data sent to the debug output, specify "" for the delimiter.

The profiling report is a tab-delimited file named after your workbook plus "_VBA_PROFILE.TXT". It gives the procedure name, number of times it was called, and the total time in seconds spent in that procedure, both including and excluding the time for the procedures it calls. For example:

Module.Proc	Count	Inclusive time	Exclusive time	Average time	Index
usercode.Main	1	7.9249538	1.5243795	1.5243795	1
usercode.subrecurse	3	0.7719876	0.4008644	0.133621467	2
usercode.sub2	2	4.0001536	7.64E-04	3.82E-04	3
usercode.sub3	6	5.9989464	5.9989464	0.9998244	4

Tł	ne report columns are:	
A	Module.Proc	Module name and procedure name
В	Count	Number of times the procedure was called
С	Inclusive time	Execution time of this procedure and all those it calls
D	Exclusive time	Execution time within this procedure only
Е	Average time	The average run time of the procedure, the exclusive time
di	vided by the count of a	calls
F	Index	A sequence number

If you also selected code coverage analysis, a workbook is created with one sheet containing the contents of the _VBA_COVERAGE.TXT file with an extra column added to show the number of times a line of code was executed and the execution time of each line in microseconds.

If you lose the original workbook, you can remove the profiling code by doing a Search, use Pattern matching, and Replace All with nothing for these Find What strings:

Dim P_ * P_O *&:

Workbook Menu



Clear Unused Range

Reset Excel's used range

Excessive formatting can cause a worksheet to have a larger used range (as shown by Ctrl+End in Excel) than the range occupied by data. This option clears cells to the right of and below the data range. When you then save the workbook that should reset the Excel used range.



Delete All Styles

Remove excessive styles

lect		×
Choose one option:		
1. Select, open, and XLSX/XLSM workbo styles from XML	deep clean an ok: remove custom	
○ <u>2</u> . Delete custom sty	les in active workbook	

Styles often become duplicated when copying from one workbook to another, leading to possibly thousands of unwanted styles; that reduces workbook stability.

The first option is a deep cleaning method that deletes the non-builtin styles from the styles.xml component of xlsx or xlsm files. Excel may warn of unreadable content when you open the file after this. Because this carries the risk of corrupting the workbook, it creates a backup file.

The second option is used only when the workbook is already open; it may fail to remove styles with corrupted names.

Save Copy As...

Save a copy of the workbook

This saves a copy of the active workbook under another name, without changing the name of the workbook in memory. It is useful in keeping copies of a file for documentation purposes while still keeping the current file name which might be linked to from XLTest documentation sheets.

Copy to new workbook

Copy all sheets to a new workbook

This creates a cleaner copy of the open workbook by copying all the sheets and VBA to a new workbook. It usually results in a smaller file with no excess range names or styles. If you get a "Compatibility Checker" warning with Excel 2003 files, you can turn it off by unchecking the box "Check compatibility when saving this workbook". If it contains external links, you may be prompted to update values; you can cancel that dialog if the source file is missing. Excel copies only the values of What-If Data Tables, not the {TABLE()} array formula.

Unprotect active sheet

Remove active sheet protection

This can be used to remove the sheet protection set by the Excel command "Protect Worksheet" when you do not know the password. It should unprotect the sheet in a minute or two.

Totected sheet		_ <u>c</u> as
Enter the password or leave blank for	d to unprotect hidden shee automatic unprotection	t Data

The password found is shown. It is not the real password, merely one that happens to match Excel's encoding of the original:



Unprotect workbook and sheets

Remove workbook structure protection

This is similar to "Unprotect sheet" but removes the workbook structure protection set by the Excel command "Protect Workbook"

Delete Unused Number Formats

Delete custom formats not used on any sheet, from active workbook

This helps you tidy up a workbook with too many formats. It exports the formats from the workbook XML, identifies the custom formats, searches for them being in use in any sheet, and deletes any formats not found to be in use.

Delete unused custom cell formats	\times
Of the 8 Custom Number Formats in this workbook,6 are unused - do you wish to delete them?(Excel built-in formats will not be deleted)	
<u>Y</u> es <u>N</u> o	

Unhide / Delete Names

This allows you to see names normally hidden from Excel's name manager, and to delete names that contain #REF in their formula.

Unhide names, delete #REF names		
✓ Unhide <u>a</u> ll names		
✓ Delete names containing #REF		
<u>O</u> K	Cancel	

Import all VB Components

You are asked to select a folder to import all VB Components from. Select one, and all the .bas (module), .cls (class), and .frm (form) files in the folder are imported into the current workbook's VB project, replacing any of the same name already there.

Export all VB Components

You are asked to select a folder to export all VB Components to. Select one or click "New Folder" in the dialog to create one, and all the modules, classes, and forms in the current workbook's VB project are saved there.

Export VBProject to text file

Export Active VB Project to one file	×
Select folder F:\DOCS\MyDocum	nents
File name	my workbook.xlsm.VB
Remove leading lin	ne numbers
□ Sort procedures	
Tab-delimited outp	ut with proc/line fields
<u>O</u> k	Cancel

This creates one text file containing all the VBA code from your project. It is the same as that used in the Compare VBA routine. The Tab-delimited output is used in the VBA Profiling feature.

Scan Files menu

List and process folders of Excel spreadsheets

Scan Shortcut	
List Excel fi	lenames
Analyse file	es in list
Run macro	on files
Manage pa	sswords
Set Master	password
List records	for a file
SQL SQL comma	and / Query DB
Compact as	nd Repair DB
List DB Sch	ema

List Excel filenames

List Excel files to a new worksheet

Starting <u>folder</u>	F:\DOCS\		
Find files li <u>k</u> e	*.XLS*		
Maximum fol <u>d</u> er der	oth (blank=all)		
Select out	put format	Fields listed:	
• Worksh	eet	FullPath	
C Tab set	parated text file	Filename Filesize	
C XML file		Created Modified Accessed	
	S Access) file	Attributes	
F:\DOCS\XLTestDir	.mdb		

This creates the specified output file with a list of the files found whose extension matches the pattern. The filename shown for worksheet output is in fact an Access MDB file used as a temporary storage before the final output is sent to a sheet. The MDB-only output is recommended if there are more than a million files to be found, because of the 1048576 row limit in Excel.

	Sheet4						-	
1	A	В	C	D	E	F	G	H
1	Directory	FileName	Size	Created	Accessed	Modified	Attributes	ID
2	F:\DOCS\XLTest2010\Ex1Demo\	#Cof(1) EX1DEMO.XLS	159,744	2016-08-01 19:05:39	2016-08-01 19:05:39	2016-08-01 19:05:40	A	
3	F:\DOCS\XLTest2010\Ex1Demo\	#Cof(2) EX1DEMO.XLS	163,840	2016-08-02 12:01:21	2016-08-02 12:01:21	2016-08-02 12:01:23	A	1
4	F:\DOCS\XLTest2010\Ex1Demo\	#DpC(1) EX1DEMO.XLS	147,456	2015-11-10 14:41:00	2015-11-10 14:41:00	2015-11-10 14:41:02	A S	1
5	F:\DOCS\XLTest2010\Ex1Demo\	#DpC(2) EX1DEMO.XLS	207,360	2016-08-01 19:06:17	2016-08-01 19:06:17	2016-08-01 19:06:18	A	
6	F:\DOCS\XLTest2010\Ex1Demo\	#DpL(1) EX1DEMO.XLS	136,704	2015-11-10 14:40:53	2015-11-10 14:40:53	2015-11-10 14:40:54	A	ŧ
7	F:\DOCS\XLTest2010\Ex1Demo\	#DpL(2) EX1DEMO.XLS	191,680	2016-08-01 19:06:08	2016-08-01 19:06:08	2016-08-01 19:06:10	A	1



Analyse files in list

Analyse selected range of Excel file names

Filduen tows are skipped. Progress is shown in the Excers	tatus bar
Use stored passwords for protected workbooks & sheets	User macro function to return data for field [SpareLongTe
Prompt to enter password if unprotect fails	'XLTest158full.xlam'!SheetNamesString
Attempt auto-unprotection of sheets (slow)	Save scan results worksheet every 10 minutes
$\overline{\mathbf{v}}$ Count cell and formula statistics in all <u>W</u> orksheets	Save results in <u>d</u> atabase Database update options
Recalculate worksheets to check for circular references	What should be done where the file size and date modified is the same as the last analysis result:
 Use slow method to count special cell statistics: constants, formulas, validations, comments 	C Do nothing (skip the file)
Create list of all sheets and statistics in all files	$\ensuremath{\mathbf{C}}$ Retrieve results from last analysis to worksheet
 Check Links status (caution: will prompt for password for each protected linked workbook) 	 Re-analyze and add this result to the database Prompt for the action in each case

The option to "Use stored passwords" is available when the "Manage Passwords" button has been used to save Workbook Open passwords in an encrypted file to help automatic processing.

The "Save results in database" option is available when the database exists and is configured using the connection string in XLTest Options.

If you check "Use slow method to count special cell statistics" that gives extra information at the cost of more time.

As well as populating the "XLScan" sheet with statistics, this also creates a "ScanLinks" sheet listing the external links in the files. This can be used to show what interdependencies exist among the workbooks.

The macro function box is a way to specifies extra processing for each file. The example "SheetNamesString" returns a list of sheet names delimited by slash characters. You can specify your own macro that you wish to run on each file. Be aware that if that macro throws an untrapped error, processing may halt at that point.

XLTest

ScanLinks

XLScan columns

			columns			
FullName	PropertyName1	nValidations	LinkNo			
Name	PropertyValue1	nDVCells	WBFullName			
Size	PropertyName2	nFormatConditions	WBDrive			
Created	PropertyValue2	nCFCells	WBShareName			
Accessed	FirstEntry	nComments	WBDirectory			
Modified	Found_In_VBA	nConstants	WBName			
Attributes	nExcelLinks	nConstantErrors	WBModified			
FileFormat	LinkSources	nNumbers	ObjectType			
ScanMsg	nAllLinks	nFormulas	ObjectName			
ScanTime	nTotLinkFormulas	nFormulaErrors	ObjectSubType			
Options	CalcVersion	nDistinctFormulas	LinkLocation			
AuditDate	nWBSet	nUsedCells	LinkSource			
Updated	WBSettings	nObjects	LinkFullName			
Deleted	nNames	MaxCol	LinkDrive			
UserID	nSheets	MaxRow	LinkShareName			
UserNotes	nWorksheets	nArrayFormulas	LinkDirectory			
Drive	nModules	MaxLenFormula	LinkName			
ShareName	nForms	MaxComplexity	LinkRelativePath			
Directory	nClasses	nTotComplexity	LinkFileExists			
Author	nLines	Scoring	LinkModified			
Last_Author	nWSSet	SpareText	LinkInf			
Last_Print_Date	WSSettings	SpareLongText				
Title	Found_In_Formulas	ID				
Company	Found_In_Values	nStyles				
Table of columns in the results sheets						

Run macro on files

Run a macro on each of the workbooks in a column of file names

To specify your own macro, prefix it with the workbook name, eg Personal.xls!MyMacro

Run n	nacro over selected file names
For each workbo the workbook re the parameter if the macro in the Then it closes th	ok name in the current selection, this opens adonly and runs the given macro, passing non-blank. It stores any return result(s) from current sheet starting in the given column. we workbook and continues.
Selection:	A2:A223
Macro name	FindInActiveWorkbook
<u>P</u> arameter	Password
Result column number (0=none)	9
	□ <u>A</u> sk to continue after each file
1	OK Cancel
<u></u>	

Manage passwords

Manage workbook open passwords

This maintains a list of passwords that will be tried in succession to open workbooks which have password protection. There is no association of any specific workbook to a given password. You cannot view existing passwords, only add to them or delete specified ones. By the way the examples shown in the picture are from lists of the top ten worst passwords! Passwords to unprotect worksheets are stored unencrypted in a file XLTestPasswords.tsv. These text files are saved in the same folder as the add-in.

123456		
password		
12345678 gwerty		
abc123		
iloveyou		
letmein		
password1		
000000		

Set Master Password

Set Master Password, initialise password file

The first time this option is taken, it creates a file "XLTestPasswords.txt" in the same folder as the XLTest add-in. Its contents are encrypted. On subsequent times that you take this option, you can change the password:

assword		23
Please supply the Ma	aster password to access the password file	
Current password:	Password1	
	Show characters	
Passwords must b lowercase, upperc	e at least 8 characters long and have ase, and non-alpha characters	
A Participant of the second second	My 1st pwl	_
New password.	I wy ist pwi	
New password: Confirm password:	My 1st pw!	

List records for a file

Prompt for a filename and list its database records

In the Select File dialog, select the file. If there are any records in the database for it, they are listed on a new worksheet. The Audit sheet lists the summary information from when Scan Files was run.

SQL Command / Query DB

Issue a SQL command to the database

In the dialog, enter any SQL command to report on the audit results. For example:

SELECT fullname FROM audit WHERE name LIKE 'ex1demo%'

The database schema is shown below. The Audit table contains the summary information. The Results table contains one record for each test performed. There is no predefined report in XLTest for this information. Apart from using the SQL command to query it, you could also design reports in Access if you wish.

For example, to query for all the workbooks that link to an add-in named 'inventory.xla', you could use:

```
SELECT *
FROM Results INNER JOIN Audit ON Results.Auditid = Audit.ID
WHERE (((Results.Item)='Link') AND ((Results.TextValue) Like
'*inventory.xla'));
```

List DB schema

List the schema of a Jet/Access file

You are prompted to select an MDB or ACCDB file. This creates a list of tables and fields in that database.

The SQL type is that used in the ADO driver. The DataTypeEnum is defined at https://msdn.microsoft.com/en-us/library/ms675318(v=vs.85).aspx

The Column Flags are documented under DBCOLUMNFLAGS at https://msdn.microsoft.com/en-us/library/ms716934(v=vs.85).aspx

Schema of XLTest database

Tabla	Column	Access	Desition	SQL	Column	Sino	Nullab
	Column	туре	Position	i ype	Flags	Size	Ie
Audit	Fuliname		1	130	106	255	TRUE
Audit	Name	Text	2	130	106	255	TRUE
Audit	Size	Double	3	5	122		TRUE
Audit	Created	Date	4	/	122		TRUE
Audit	Accessed	Date	5	7	122		TRUE
Audit	Modified	Date	6	7	122		TRUE
Audit	Attributes	Text	7	130	106	255	TRUE
Audit	FileFormat	Text	8	130	106	255	TRUE
Audit	ScanMsg	Text	9	130	106	255	TRUE
Audit	ScanTime	Double	10	5	122		TRUE
Audit	Options	Text	11	130	106	255	TRUE
Audit	AuditDate	Date	12	7	122		TRUE
Audit	Updated	Date	13	7	122		TRUE
Audit	Deleted	Date	14	7	122		TRUE
Audit	UserID	Text	15	130	106	255	TRUE
Audit	UserNotes	Text	16	130	106	255	TRUE
Audit	Drive	Text	17	130	106	255	TRUE
Audit	ShareName	Text	18	130	106	255	TRUE
Audit	Directory	Text	19	130	106	255	TRUE
Audit	Author	Text	20	130	106	255	TRUE
Audit	Last_Author	Text	21	130	106	255	TRUE
Audit	Last_Print_Date	Text	22	130	106	255	TRUE
Audit	Title	Text	23	130	106	255	TRUE
Audit	Company	Text	24	130	106	255	TRUE
Audit	PropertyName1	Text	25	130	106	255	TRUE
Audit	PropertyValue1	Text	26	130	106	255	TRUE
Audit	PropertyName2	Text	27	130	106	255	TRUE
Audit	PropertyValue2	Text	28	130	106	255	TRUE
Audit	FirstEntry	Text	29	130	106	255	TRUE
Audit	Found_In_VBA	Memo	30	130	234	0	TRUE
Audit	nExcelLinks	Integer	31	3	122		TRUE
Audit	LinkSources	Memo	32	130	234	0	TRUE
Audit	nAllLinks	Integer	33	3	122		TRUE
Audit	nTotLinkFormulas	Double	34	5	122		TRUE
Audit	CalcVersion	Double	35	5	122		TRUE
Audit	nWBSet	Integer	36	3	122		TRUE
Audit	WBSettings	Memo	37	130	234	0	TRUE
Audit	nNames	Integer	38	3	122		TRUE
Audit	nSheets	Integer	39	3	122		TRUE
Audit	nWorksheets	Integer	40	3	122		TRUE
Audit	nModules	Integer	41	3	122		TRUE
Audit	nForms	Integer	42	3	122		TRUE
Audit	nClasses	Integer	43	3	122		TRUF
Audit	nl ines	Integer	44	3	122		TRUF
Audit	nWSSet	Integer	45	3	122		TRUE
Δudit	WSSettings	Memo	40 46	130	23/	Ο	TRUE
Audit	wooddungs	Monto	-10	100	204	0	INCE
Audit	Found_In_Formulas	Memo	47	130	234	0	TRUE
---------	-------------------	---------	----	-----	-----	-----	-------
Audit	Found_In_Values	Memo	48	130	234	0	TRUE
Audit	nValidations	Double	49	5	122		TRUE
Audit	nDVCells	Double	50	5	122		TRUE
Audit	nFormatConditions	Double	51	5	122		TRUE
Audit	nCFCells	Double	52	5	122		TRUE
Audit	nComments	Double	53	5	122		TRUE
Audit	nConstants	Double	54	5	122		TRUE
Audit	nConstantErrors	Double	55	5	122		TRUE
Audit	nNumbers	Double	56	5	122		TRUE
Audit	nFormulas	Double	57	5	122		TRUE
Audit	nFormulaErrors	Double	58	5	122		TRUE
Audit	nDistinctFormulas	Double	59	5	122		TRUE
Audit	nUsedCells	Double	60	5	122		TRUE
Audit	nObjects	Double	61	5	122		TRUE
Audit	MaxCol	Integer	62	3	122		TRUE
Audit	MaxRow	Integer	63	3	122		TRUE
Audit	nArrayFormulas	Double	64	5	122		TRUE
Audit	MaxLenFormula	Integer	65	3	122		TRUE
Audit	MaxComplexity	Integer	66	3	122		TRUE
Audit	nTotComplexity	Double	67	5	122		TRUE
Audit	Scoring	Integer	68	3	122		TRUE
Audit	SpareText	Text	69	130	106	255	TRUE
Audit	SpareLongText	Memo	70	130	234	0	TRUE
Audit	ID	Integer	71	3	90		FALSE
Audit	nStyles	Integer	72	3	122		TRUE
Results	AuditID	Integer	1	3	122		TRUE
Results	Item	Text	2	130	106	255	TRUE
Results	Name	Text	3	130	106	255	TRUE
Results	ItemIndex	Text	4	130	106	255	TRUE
Results	TextValue	Memo	5	130	234	0	TRUE
Results	AltText	Memo	6	130	234	0	TRUE
Results	DataType	Integer	7	3	122		TRUE
Results	Number	Double	8	5	122		TRUE
Results	Counter	Integer	9	3	122		TRUE
Results	Location	Memo	10	130	234	0	TRUE
Results	Flag	Text	11	130	106	1	TRUE
Results	ExtendedInfo	Memo	12	130	234	0	TRUE
Results	Report	Text	13	130	106	4	TRUE
Results	ColorIndex	Integer	14	3	122		TRUE
Results	Timestamp	Date	15	7	122		TRUE
Results	ID	Integer	16	3	90		FALSE

Shortcuts Keys menu

As it appears in the Ribbon menu	As it appears with a right-click on a cell
Data Review XLTest View	
Automatic Mem:396MB	T+ 1 Copy Formula
Shortcut No Iteration	Gc 2 Copy Text
Keys ~	"\$" <u>3</u> Copy Address
<u>1</u> Copy Formula	크 <u>고</u> 크 <u>4</u> Operate on selection
	■ 5 Go To Reference
ABC 2 Copy Text	Flag active cell
"·"	2 Select from Active Cell
3 Gopy Address	8 Select Formula region
4 Operate on selection	9 Names containing selection
	[≣ Ω Jump to bottom right
5 Go To Reference	En [Show Precedent formulas
	Show Dependent formulas
E Flag active cell	Q View \$DB_ filtered by this
E Z Select from Active Cell	
8 Select Formula region	
9 Selection in names	
Jump to bottom right	
Show Precedent formulas	
☐] Show Dependent formulas	
V Filter \$DB_ by this item	
Efresh right-click menu	

Copy Formula

Copy formula in current display style (A1 or R1C1) from active cell to Windows clipboard.

Copy Text

Copy text from active cell to clipboard.

This can be used to copy values into other applications without the line terminator that Ctrl+C adds.

Copy Address

You can select how much detail in the address to copy:



Operate on selection

This provides options to copy or move multiple selections, which Excel does not do. If you attempt in Excel to copy the selection shown, you receive an error message:

	A	В		C	D	E	F	G	H
1									
2									
3		B3							
4			C4						
5									
6		B6		Microso	ft Excel				X
7									
8				A.	That comm	and cannot	he used on a	ultiple selec	tions
9				- Inac command cannot be used on multiple set					
10									
11						U			
12									

Example: select B3, C4, B6 and press Tab to make the first cell (B3) the active cell. Then press Ctrl+Alt+3 and you get the following dialog:

	A	В	C	D	E	F	G	н
1								
2					Opera	tion on Mult	tiple Selection	
3		B3						
4			C4		Sourc	e 3 cells ir	n 3 areas	
5		-			Sel	ect the action	to be perform	ed 🔤
6		B6			6	Copy		
7								
8					1 2	Copy Value	only	
9					0	Move		
10								
11		_			Active	e cell is B3		
12					Select	Destination f	for active cell, o	ther
13		_			cells in	n the selection	n are relative to) this
14		_			She	et21\$D\$7		19
15		_						-
16					This c	annot be und	one	
17						1.00		1
18						QK	Cancel	
19							-	
0.0								

Click in the Destination box and then click on D7, then click OK. Now the multiple selection is copied, starting with B3 being copied to D7, and the rest relative to that.

Go To Reference

Go to the address in the cell This selects the range referred to by the hyperlink or address in the active cell.

Flag active cell

This places a flag route the cell for a table of contents You are prompted for a note to save with the flag:

Enter a note (cannot be blanky	OK
	Cancel

The flag appears on the left of the cell:

10		
19		Jan
20 Sales value	٣	1234

The flagged cell locations and notes are listed by the WB/WS documentation menu item.

Select from Active Cell

Select area right or down from active cell



This can select the current row, or column, of the current region of the cell (the area bounded by blank rows and columns) or of the entire used range of the sheet starting at the active cell. When this is selected, you might wish to format the cells, or copy the active cell's formula (fill right is Ctrl+R, fill down is Ctrl+D).

Select Formula Region

This selects the cells with the same formula (in relative R1C1 terms) in the current region. It helps you to check that the formula is copied to the correct region.

Names Containing Selection

This shows you which defined names refer to a range that includes the current selection.

Named ra	nges containing D16		X
0	NAME CCI_Factors_English CCIAIITables =CCI_ CCICalcTableEnglish	REFERS TO =CCI_CCI!\$D\$12:\$D\$2 CCI!\$A\$1:\$AY\$46 =CCI_CCI!\$A\$12:\$V\$20	6 5
		Ok	

Jump to Bottom Right

Goes to the intersection of the last row and the last column with any data.

Show Precedent Formulas Show Dependent Formulas

These display a dialog showing the address of the active cell, the first 300 characters (up to approximately 4 lines) of its formula, and a list of the unique formulas in the precedent or dependent ranges. They can be useful for tracking the logic of calculations.

	'Errors'IE20 Precedents
'Errors''E20 : =Bu Precedents	lget08!N70+'F:\DOCS\XLTest2010\Ex1Demo\[s3errors.xls]InsRow'!\$E\$5+B20
Budget08"N70	Budget08*N70=SUM(R[-1]C[-12]:R[-1]C[-1]) OOKUP("Belt" 'E'\DOCS\XI Test2010\Ex1Demo\s3errors xIs*PriceList 2 EALSE*100



View **\$DB_** filtered by this item

For the sheets \$Names and \$Styles, this filters the \$DB_ sheet to show only the detailed results, the references to the item in the active row of the sheet. This helps you see where Names and Styles are used.

For \$Links, it filters the \$WSXref sheet list "Used by".

User defined Functions

Function	Description	Example
ColorName(Colorindex)	Return color name from index	=ColorName(1)
USTDate(date)	Convert text mm/dd/yyyy or mm-dd-yyyy to a date	=USTDate("12/1/2008")
EUTDate(date)	Convert text dd/mm/yyyy or dd-mm-yyyy to a date	=EUTDate("12/1/2008")
TextToDate(text, format)	Convert text to date specifying order and delimiter	=TextToDate("08-02-09","mdy-")
IsLike(text, pattern)	True if text matches Pattern regular expression	=lsLike("abc@def.ghi","*@*.???")
Alphas(text)	Returns alphabetic characters in text	=Alphas(B5)
Numerics(text)	Returns numeric characters in text	=Numerics(K5)
TextToValue(text, [minus], [decimal])	Converts text to number, optional negative and decimal symbols	=TexttoValue("12.3-")
GetFormula(cell, refstyle)	Returns formula of a cell. Default 1=A1, else R1C1	=GetFormula(K9,1)
JoinValues(range, delimiter)	Concatenates range to a delimited text string	=JoinValues(G2:G15,",")
SumN(range)	Sums non-formula cell values excluding dates, text, errors	=SumN(A1:K10)
FileSize (filename)	Returns size of a file given its name	=FileSize("test103.csv")
DateModified(filename)	Returns modified date of a file given its name	=DateModified("somefile.xlsx")
DirFile(fileno, filespec)	Returns the file name in the given position in a folder. Wildcards allowed.	=DirFile(1,".\Version*.xlsx") =DirFile(2,"C:\dir*.*")

XLTest provides these functions for use in your spreadsheets.

Book: 'Spreadsheet Check and Control' cross-reference

47 key practices to detect and prevent errors Patrick O'Beirne, 2005, ISBN 190540400X Systems Publishing, Tara Hill, Gorey, Co. Wexford, Ireland

	CATEGORY: 1 Design					
Skill set.	: 1.1 Specification					
1.1.1	Define spreadsheet specifications.	Use \$ReadMe sheet				
		\$DOC sheet lists file properties				
1.1.2	Use cell comments and descriptions to list sources	Use \$ReadMe sheet				
	and assumptions.	\$DOC sheet lists table of contents				
1.1.3	Be explicit about conventions, methods, functions,	Use \$ReadMe sheet				
	formats, and policies.	\$APP sheet lists application				
		settings				
Skill set.	: 1.2 Security					
1.2.1	Make regular secure backups of spreadsheet and	Use Save Copy As				
	related files.					
1.2.2	Maintain separately saved versions of spreadsheets	Use Save Copy As				
	in development.					
1.2.3	Understand the security limitations of password	XLTest can bypass worksheet				
	protection.	protection passwords				
1.2.4	Use passwords of at least 8 mixed case, non-	\$DOC sheet lists passwords				
	alphanumeric characters.					
	CATEGORY: 2 Input					
Skill set.	: 2.1 Set-up					
2.1.1	Simplify long formulas and use named ranges.	\$DOC sheet lists defined names				
2.1.2	Isolate constants into their own cells.	\$INF sheet lists cells with				
		embedded constants				
2.1.3	Identify units of measure and conversion	Use \$ReadMe sheet				
	calculations.					
2.1.4	Understand the "precision as displayed" setting.	\$DOC sheet lists settings				
2.1.5	Understand and use manual, automatic calculation.	\$DOC sheet lists settings				
CATEGORY: 3 Calculation						
Skill set.	: 3.1 Fundamentals					
3.1.1	Understand the order of precedence of mathematical	n/a				
	operators.					
3.1.2	Remove circular references.	\$DOC sheet lists circ refs				
3.1.3	Identify array (matrix) formulas.	\$INF sheet lists arrays				
Skill set.	: 3.2 Error Identification					
3.2.1	Identify missing input values.	Colorize Data Types & Usage to				
		show blank input cells in pink				
3.2.2	Identify cells with missing dependents.	Colorize Data Types & Usage to				
		show final formulas, visual check				
3.2.3	Use information functions: ISERROR, ISNA.	Inspect sheet to list error values				
3.2.4	Suppress display of #DIV/0! values.	Inspect sheet to list error values				
Skill set.	: 3.3 Error Correction					
3.3.1	Correct relative, absolute and mixed cell references.	Colorize Formulas to discover				
		inconsistent patterns				

3.3.2	Identify and correct error values indicated by #	Inspect sheet to list error values
2 2 2	Siglis.	Colorize Formulas to discover
5.5.5	Correct inconsistencies in a pattern of formulas.	inconsistent patterns
3.3.4	Correct mistakes in totals caused by inserting.	Colorize Dependents to discover
	deleting rows and columns.	cells omitted from total formulas
3.3.5	Correct grand totals that double-count subtotals.	Colorize Dependents to discover
	5	cells double-counted in formulas
3.3.6	Correct mismatched cross-check totals.	Colorize Formulas to discover
		inconsistent patterns
3.3.7	Correct mistakes created by incorrect use of	Colorize Dependents to discover
	automatic sum feature.	cells omitted from total formulas
3.3.8	Replace linking by cell address with linking by	\$DOC sheet lists links
	range name between files.	
3.3.9	Recognise link references and understand problems	\$DOC sheet lists links
	caused by changes in linked files.	
3.3.10	Modify a lookup function to return an exact,	n/a
	approximate value.	
3.3.11	Sort a list that is used for an approximate match in a	n/a
	lookup function.	
~	CATEGORY: 4 Outputs	
Skill set.	A.I Appropriate Display	
4.1.1	Reveal data hidden by formatting.	Inspect sheet to reveal same font &
		fill colours. Use Colour by
4.1.2		Formats to check for consistency.
4.1.2	ROUND.	n/a
4.1.3	Correct cell content of incompatible data type such	Colorize Data Types to discover
	as numbers entered as text.	inconsistent patterns of input data
4.1.4	Correct a cell range incorrectly sorted by one	n/a
	column.	
4.1.5	Correct database range in a worksheet to get correct	n/a
	query output.	
4.1.6	Correct database criteria.	n/a
Skill set.	: 4.2 Charts	
4.2.1	Modify chart layout so that all data series are clearly	n/a
4.2.2	V1S1ble. $M = \frac{1}{2} \int dx dx = \frac{1}{2} \int dx dx dx = \frac{1}{2} \int dx dx dx = \frac{1}{2} \int dx dx dx dx dx dx = \frac{1}{2} \int dx dx dx dx dx dx dx = \frac{1}{2} \int dx $	
4.2.2	Modify the scale of chart axes to clarify chart	n/a
423	Modify chart type to clearly express the meaning of	n/a
7.2.3	data	in a
	CATEGORY: 5 Review	
Skill set.	5.1 Testing	
5.1.1	Create and run test cases covering all logic paths.	Use Test Cases features. or Excel
		Scenarios
5.1.2	Verify outputs by using a different calculation	n/a
	method.	
5.1.3	Unhide formulas, rows, columns, worksheets.	\$DOC sheet lists hidden rows,
		columns, and worksheets

5.1.4	Show all formulas in a worksheet.	Ctrl+` toggle
5.1.5	Inspect all formulas in a worksheet.	Inspect sheet button
Skill set:	5.2 Data Integrity	
5.2.1	Use IF function to test if cell contents are within	n/a
	defined parameters.	
5.2.2	Use conditional formatting to highlight specific data	Colorize Conditional Formatting to
	attributes.	discover irregular patterns
5.2.3	Set data validation criteria.	Colorize Data Validation to
		discover irregular patterns
Appendi	x A: Microsoft Excel error checking	\$INF sheet lists cells failing Excel
		error checks
Appendi	x B: MS Excel Keyboard Shortcuts	Help key lists common shortcuts
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