

Testing for Dates Falling On a Federal Holiday

A Simplified Procedure

XL Audit Commander

data analysis made easier ...

Testing for Holiday Dates

Certain financial transactions, for example journal entries, may not be expected to occur on holidays, especially if the business is closed on those dates. Thus, under some circumstances, their occurrence can be a “red flag” that further review may be warranted.

Although it is possible to visually inspect dates in an attempt to identify holidays, that process can be tedious and time consuming. The procedures described here are an efficient and effective way to identify and quantify transactions which fall on a federal holiday (U.S. only). The procedure requires the use of the XL Audit Commander, a free tool available for download from <http://ezrstats.com>. The tool is installed as an Excel add-in, and as such, requires Excel 2000 or later. The tool works only on Windows operating systems.

Testing for Holiday Dates

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Procedural steps

Testing for Holidays

How are Federal Holidays defined?

Federal law (5 U.S.C. 6103) establishes the public holidays for Federal employees. There are ten days defined, and the holiday either falls on a specific day (unless that day is a weekend), or else is a floating day. The table below lists the holidays and how they are determined:

Date	Description	Type
New Years day	January 1st	Specific date
Martin Luther King's birthday	3rd Third Monday in January	Floating
President's day	3 rd Monday in February	Floating
Memorial day	Last Monday in May	Floating
Independence Day	July 4th	Specific date
Labor Day	First Monday in September	Floating
Columbus Day	2 nd Monday in October	Floating
Veteran's Day	November 11 th	Specific date
Thanksgiving Day	4 th Thursday in November	Floating
Christmas	December 25 th	Specific Date

Because the dates can be determined based upon an algorithm, it is possible to express that logic in computer code, in order to identify them more quickly and efficiently.

Typical audit areas

Unless a business is operating during a holiday, it will be unusual for transactions to be initiated during that period. There are numerous areas in which holiday dates might not be expected, including:

- Journal entries
- Employee expense reports
- Business telephone calls
- Invoices
- Receiving reports
- Purchase orders

Procedural steps

Classifying and Quantifying occurrences

Certain holidays might be fairly easily identified visually, especially if the number of dates is relatively small. However, when the number of dates begins to be numbered in the thousands or tens of thousands or more, the process can become tedious and error prone. (Quick – which day was Independence day celebrated on in 2004 - July 3rd, 4th or 5th? Hint – it was a Monday.) This article describes a fairly simple procedure to analyze and quantify the extent to which holiday dates exist. With such a procedure it becomes easier to obtain a quick overview of a population or perform analytical reviews which otherwise might not be feasible. This procedure is also less error prone.

For purposes of reporting, a holiday is considered to be any date which falls under the definitions shown above, i.e. one of the ten federal holidays defined.

Test data used

The data used in this article is available in the Excel workbook located at <http://ezrstats.com/online/inno/QS.xls>. The sheet named “Dates” contains hypothetical dates to be tested.

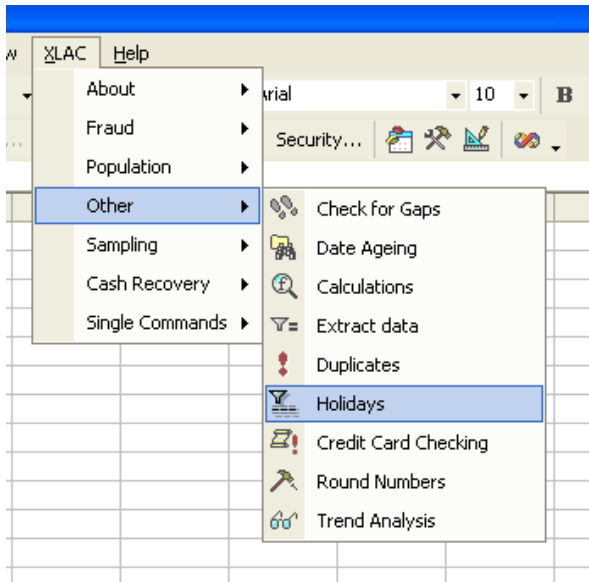
User Interface

The tool can be used in a combination of four modes:

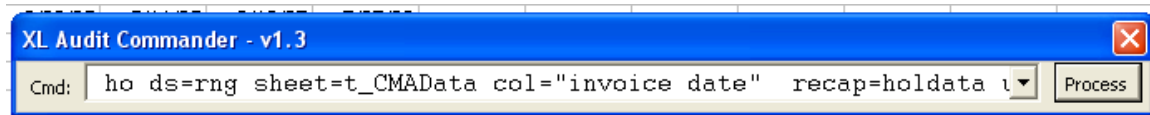
1. Menu – a graphical system to gather the required information
2. Command Bar – commands are typed as text
3. System registry – commands are stored in the system registry and then loaded for selection, modification and processing
4. \$Cmd worksheet – the main processing parameters are stored on a worksheet

The menu system allows the necessary data to be gathered in a graphical manner. Once the data has been gathered, the “Process” button is clicked and the commands are then written to the toolbar for processing. An example of the main menu is shown below (Note the added menu option “XLAC” which appears at the top of the menu bar).

Procedural steps



To perform the testing, the needed information can either be entered directly using the menu or else typed into the toolbar, which is show below.



Note that if the menu system is used, then the results will be to translate the menu information into an audit command which will then be copied into the toolbar where it can then be processed.

Holiday date testing can be performed on four types of data sources:

1. Data contained on a sheet in an Excel workbook
2. Data contained within a highlighted range of an excel sheet
3. Data contained in text file which is in tab separated value format
4. Data contained in a database

Note: there is also a menu system tailored for each of these data sources, more information is available at the links mentioned at the end of this article.)

The first page of the test data being used for illustration in this article is shown below. This data represents random dates (i.e. generated with a random number generator), and contains four columns of dates labeled Date1 through Date 4.:

Procedural steps

1	Date1	Date2	Date3	Date4
2	3/29/05	12/5/05	2/23/05	1/26/07
3	7/31/07	10/13/06	7/22/05	8/14/06
4	1/9/07	11/7/05	7/14/07	4/8/06
5	1/17/05	3/19/05	10/28/06	1/10/06
6	4/14/07	2/20/06	1/29/05	4/28/07
7	9/19/06	6/8/06	6/8/06	1/27/06
8	9/27/06	1/18/07	8/3/05	3/20/06
9	6/9/05	7/24/05	6/11/05	9/18/07
10	6/5/05	7/11/05	11/9/05	4/6/06
11	1/26/07	8/13/06	8/17/07	10/20/05
12	4/5/05	3/7/05	8/27/06	8/19/05
13	4/3/06	3/5/06	2/3/05	7/4/05
14	7/2/05	9/9/07	7/3/07	2/23/06
15	10/12/06	4/6/07	5/3/06	4/19/05
16	5/15/06	3/6/05	7/4/07	1/16/07
17	8/23/05	1/23/07	5/16/07	2/12/05
18	2/16/05	1/9/05	6/9/05	7/20/05
19	6/17/07	4/13/06	3/24/06	5/6/06
20	1/27/07	12/11/06	10/4/05	3/18/07
21	9/4/05	12/13/06	8/6/06	6/4/07
22	9/17/06	11/29/06	12/19/05	7/2/05
23	3/22/05	5/11/05	2/18/07	7/27/06
24	8/18/06	1/26/05	8/1/07	4/22/05
25	5/4/05	1/24/05	9/16/07	6/8/06
26	5/6/05	9/4/06	4/30/05	2/13/07
27	7/29/06	5/26/06	10/20/06	7/8/06
28	6/3/07	3/27/07	12/11/06	4/19/07
29	9/27/07	4/26/06	11/5/05	8/6/05
30	8/13/06	3/29/05	12/11/06	1/14/07
31	2/4/05	11/16/06	9/17/06	9/1/06
32	1/11/07	9/20/06	3/25/05	3/28/07
33	3/7/07	1/23/06	9/28/05	10/27/06

◀ ▶ ▶ ▶
\$Extract
 DupInv
 sample
 t_CMA

The first test will simply be to determine both the number of dates as well as the number of those dates that are holidays. This is done by highlighting the area on the worksheet to be tested and then typing in the command “holiday sheet=Extract” in the toolbar (all commands can either be entered in full or just the first two letters).

Procedural steps

1	Date1	Date2	Date3	Date4
2	3/29/05	12/5/05	2/23/05	1/26/07
3	7/31/07	10/13/06	7/22/05	8/14/06
4	1/9/07	11/7/05	7/14/07	4/8/06
5	1/17/05	3/19/05	10/28/06	1/10/06
6	4/14/07	2/20/06	1/29/05	4/28/07
7	9/19/06	6/8/06	6/8/06	1/27/06
8	9/27/06	1/18/07	8/3/05	3/20/06
9	6/9/05	7/24/05	6/11/05	9/18/07
10	6/5/05	7/11/05	11/9/05	4/6/06
11	1/26/07	8/13/06	8/17/07	10/20/05
12	4/5/05	3/7/05	8/27/06	8/19/05
13	4/3/06	3/5/06	2/3/05	7/4/05
14	7/2/05	9/9/07	7/3/07	2/23/06
15	10/12/06	4/6/07	5/3/06	4/19/05
16	5/15/06	3/6/05	7/4/07	1/16/07
17	8/23/05	1/23/07	5/16/07	2/12/05
18	2/16/05	1/9/05	6/9/05	7/20/05
19	6/17/07	4/13/06	3/24/06	5/6/06
20	1/27/07	12/11/06	10/4/05	3/18/07
21	9/4/05	12/13/06	8/6/06	6/4/07
22	9/17/06	11/29/06	12/19/05	7/2/05
23	3/22/05	5/11/05	2/18/07	7/27/06
24	8/18/06	1/26/05	8/1/07	4/22/05
25	5/4/05	1/24/05	9/16/07	6/8/06
26	5/6/05	9/4/06	4/30/05	2/13/07
27	7/29/06	5/26/06	10/20/06	7/8/06
28	6/2/07	3/27/07	12/11/06	4/19/07

Now click the “Process” button to obtain the overall counts displayed on the Excel status bar.

If the entire range were selected, the message on the status bar indicates there were 2,648 dates, of which 84 fell on a federal holiday.

If the name of the sheet to be processed is omitted, there will be an error message displayed on the Excel status bar.

The next test to be performed is to test the extent of holidays in the third column, which is named Date3. The values on the worksheet named “Dates” will be tested starting at the upper left hand corner, i.e. cell “A1” and continuing down to the first blank cell encountered.

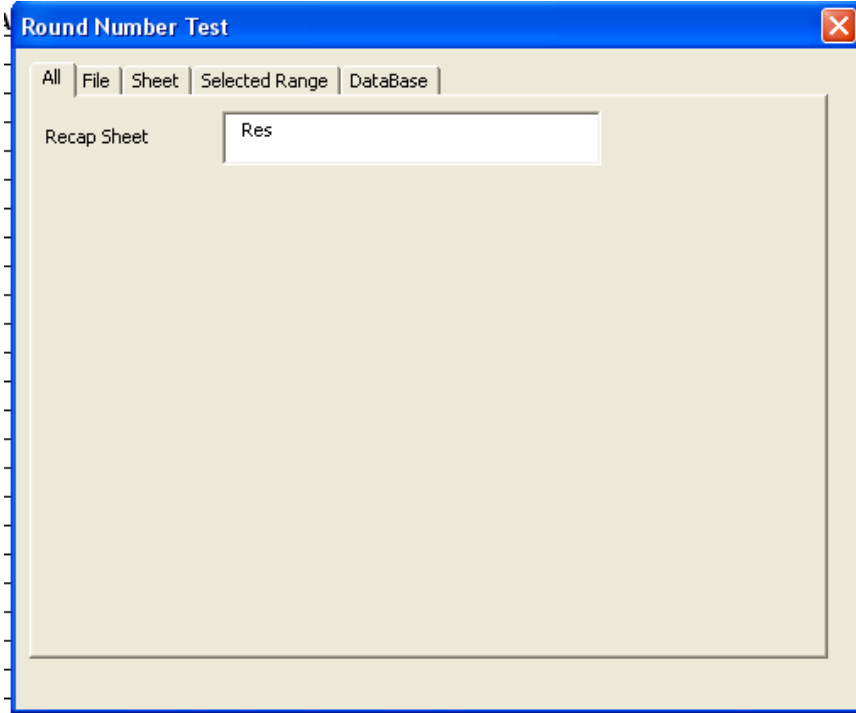
Procedural steps

For illustration purposes, both the menu options as well as the toolbar commands will be described. First select the first tab labeled “All” and specify the name of the worksheet to contain the results of the analysis. In this case, a new worksheet named “Res” (results) will be specified. (Res is the default name)

Procedural steps

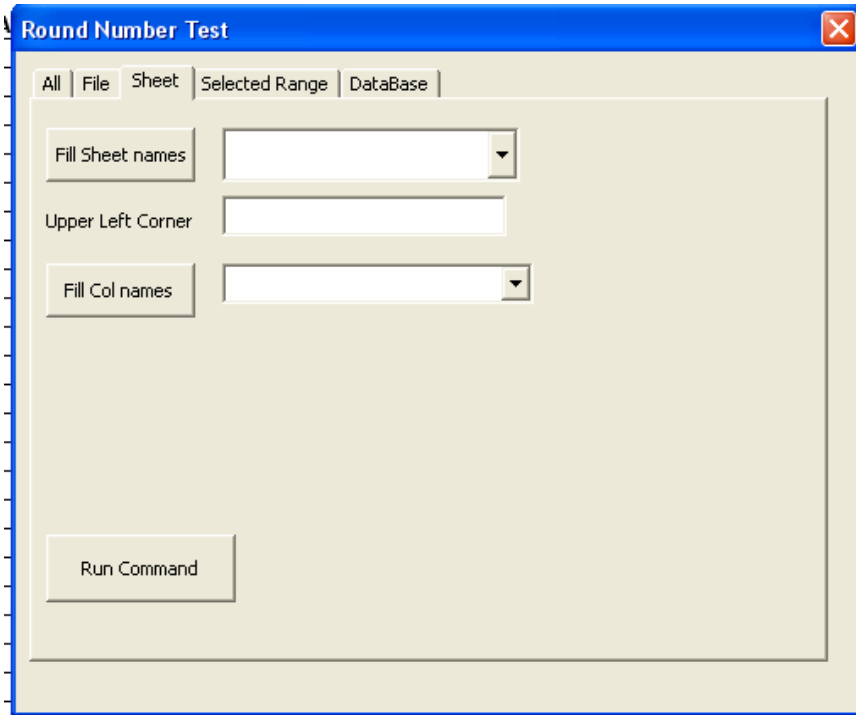
Procedural Steps

Step by step example

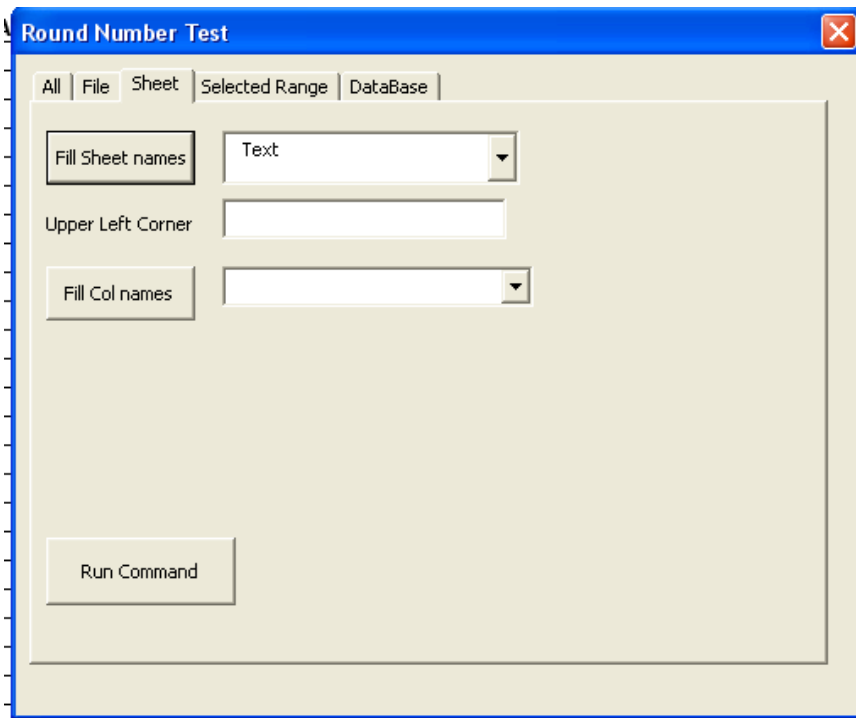


Now click on the tab labeled “Sheet” in order to specify the sheet name, upper left hand corner and column to be analyzed:

Procedural steps

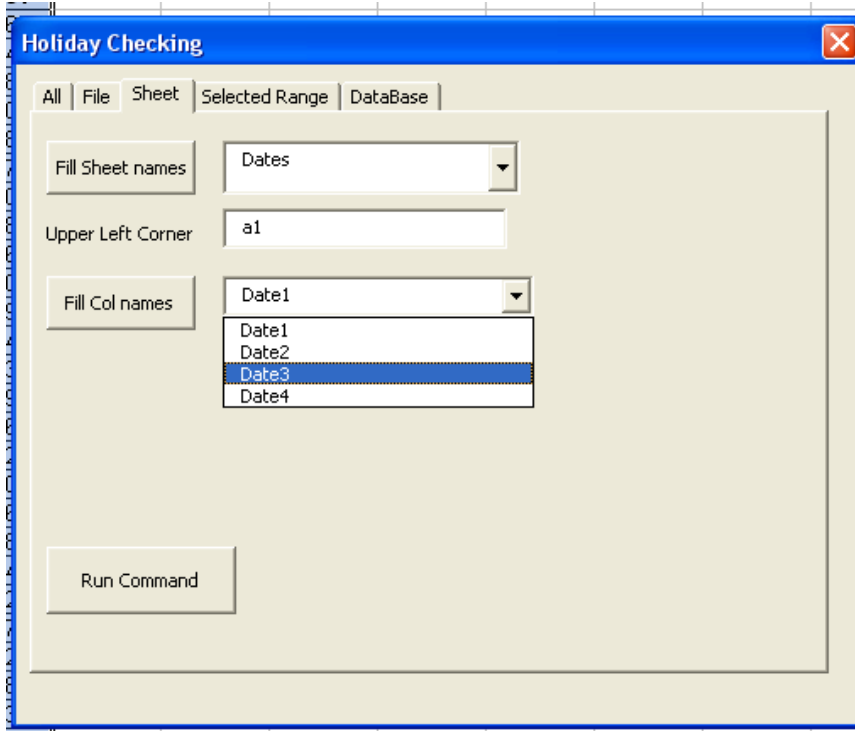


First, have the system fill in all the sheet names into the first drop down list box. This is done by clicking on the button labeled “Fill sheet names”:

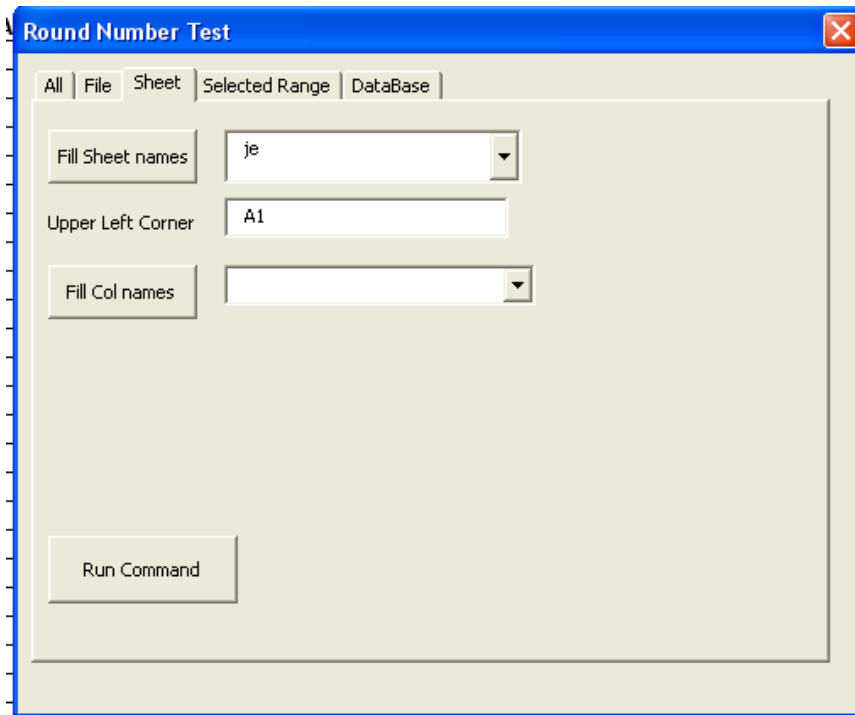


Now, click on the drop down list to select the sheet named “Dates”:

Procedural steps

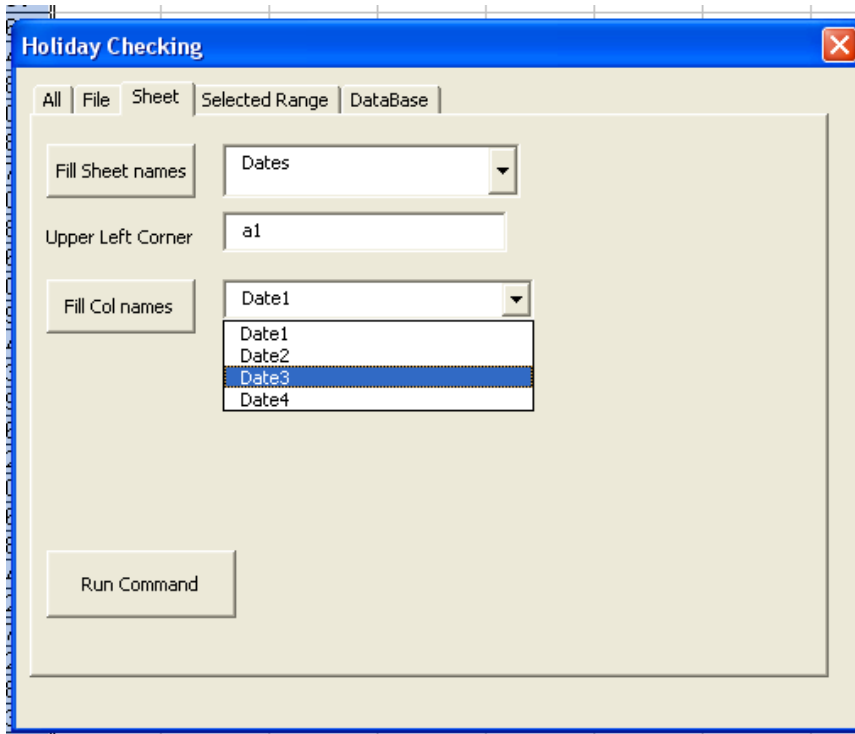


Select “Date3” and then enter the cell of the upper left hand corner, which is “A1” in this instance:

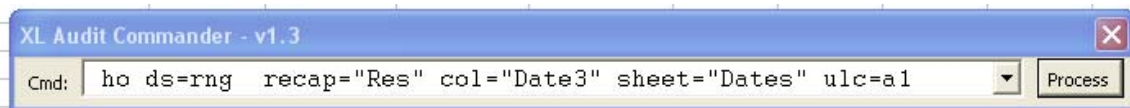


Now the system can fill in all the column names, in order that the numeric column to be tested can be specified:

Procedural steps



The next step is to click the “Run Command” button, in order to construct the command to be placed into the toolbar. The results are shown below:



Then click on the “Process” button in order to perform the analysis which is stored on the sheet named “Res” (if it doesn’t exist, it will be created, if it does exist it will be overwritten).

Procedural steps

Holiday Report:				
Holiday	Date1	Date2	Date3	Date4
7/4/2007	5/15/2006	3/6/2005	7/4/2007	1/16/2007
1/16/2006	1/4/2007	12/29/2006	1/16/2006	10/21/2006
2/20/2006	1/17/2005	10/10/2006	2/20/2006	12/31/2005
11/11/2005	8/17/2006	6/28/2007	11/11/2005	6/4/2006
12/25/2006	1/18/2007	7/20/2005	12/25/2006	4/10/2007
5/30/2005	6/6/2005	11/30/2006	5/30/2005	3/24/2005
10/10/2005	12/28/2005	2/14/2007	10/10/2005	8/6/2006
10/9/2006	1/18/2006	9/3/2005	10/9/2006	6/25/2005
10/9/2006	2/26/2005	4/25/2007	10/9/2006	3/14/2007
9/4/2006	11/6/2005	7/6/2007	9/4/2006	9/10/2006
10/10/2005	6/11/2006	3/18/2005	10/10/2005	7/8/2005
2/19/2007	2/26/2005	1/25/2005	2/19/2007	6/17/2005
9/3/2007	5/31/2007	8/11/2005	9/3/2007	3/28/2005
1/17/2005	6/17/2006	8/21/2005	1/17/2005	3/8/2005
1/15/2007	1/30/2007	12/17/2006	1/15/2007	7/4/2006
2/21/2005	3/15/2005	4/10/2005	2/21/2005	1/17/2007
2/20/2006	2/20/2006	1/14/2006	5/6/2005	10/2/2006
7/4/2007	7/4/2007	9/19/2007	9/6/2006	3/23/2007
11/23/2006	11/23/2006	1/30/2005	7/2/2007	6/9/2005
11/24/2005	11/24/2005	8/24/2005	3/9/2006	6/25/2007
5/29/2006	5/29/2006	8/20/2006	7/20/2006	5/26/2007
9/4/2006	9/4/2006	6/10/2005	2/13/2005	7/6/2007
1/16/2006	1/16/2006	3/6/2006	12/6/2005	11/16/2006
11/10/2006	11/10/2006	9/4/2006	9/30/2006	5/8/2005

This report lists those rows where Date3 is a holiday, and prepends the holiday into the first column.

We can then obtain the same report, but just select a range within the sheet. This is done by using a different tab in the menu dialog as shown below:

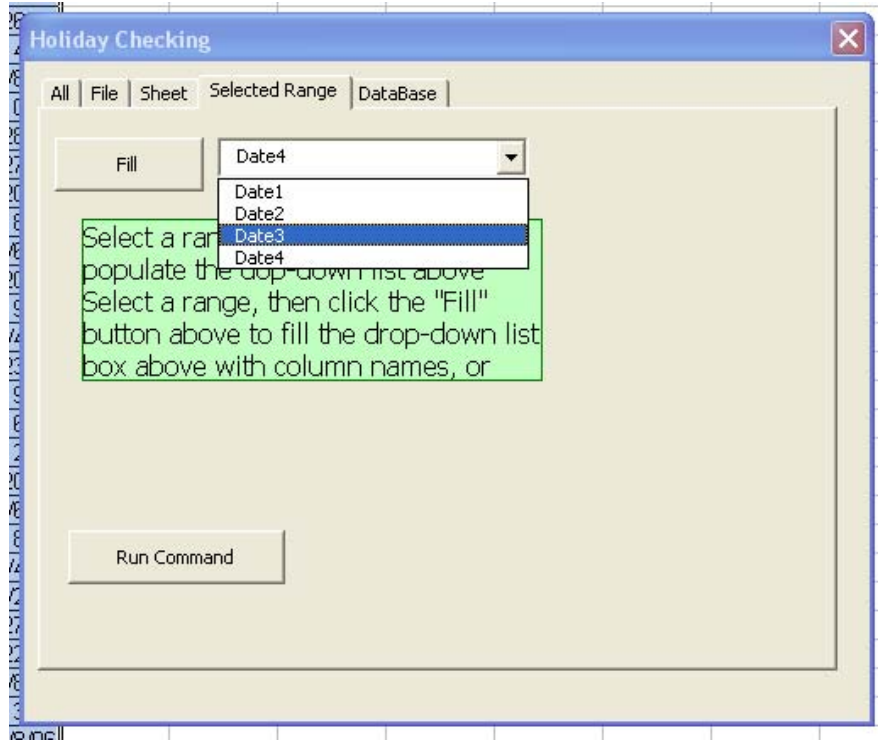
The first step is to select a range (as shown below):

Procedural steps

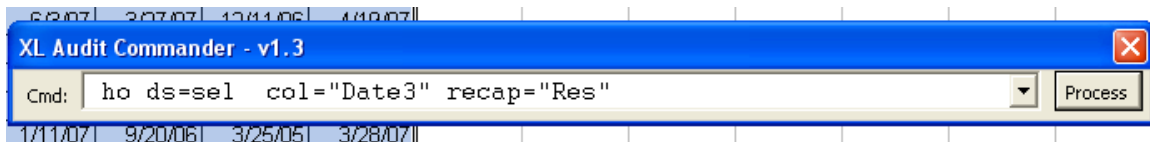
	A	B	C	D
1	Date1	Date2	Date3	Date4
2	3/29/05	12/5/05	2/23/05	1/26/07
3	7/31/07	10/13/06	7/22/05	8/14/06
4	1/9/07	11/7/05	7/14/07	4/8/06
5	1/17/05	3/19/05	10/28/06	1/10/06
6	4/14/07	2/20/06	1/29/05	4/28/07
7	9/19/06	6/8/06	6/8/06	1/27/06
8	9/27/06	1/18/07	8/3/05	3/20/06
9	6/9/05	7/24/05	6/11/05	9/18/07
10	6/5/05	7/11/05	11/9/05	4/6/06
11	1/26/07	8/13/06	8/17/07	10/20/05
12	4/5/05	3/7/05	8/27/06	8/19/05
13	4/3/06	3/5/06	2/3/05	7/4/05
14	7/2/05	9/9/07	7/3/07	2/23/06
15	10/12/06	4/6/07	5/3/06	4/19/05
16	5/15/06	3/6/05	7/4/07	1/16/07
17	8/23/05	1/23/07	5/16/07	2/12/05
18	2/16/05	1/9/05	6/9/05	7/20/05
19	6/17/07	4/13/06	3/24/06	5/6/06
20	1/27/07	12/11/06	10/4/05	3/18/07
21	9/4/05	12/13/06	8/6/06	6/4/07
22	9/17/06	11/29/06	12/19/05	7/2/05
23	3/22/05	5/11/05	2/18/07	7/27/06
24	8/18/06	1/26/05	8/1/07	4/22/05
25	5/4/05	1/24/05	9/16/07	6/8/06
26	5/6/05	9/4/06	4/30/05	2/13/07
27	7/29/06	5/26/06	10/20/06	7/8/06
28	6/8/07	3/27/07	12/11/06	4/19/07
29	XL Audit Commander - v1.3			
30	Cmd: ho ds=rng recap="Res" c			
31				
32	1/11/07	9/20/06	3/25/05	3/28/07
33	3/7/07	1/23/06	9/28/05	10/27/06

Now, a column can be selected for analysis by clicking of the “Fill” button:

Procedural steps



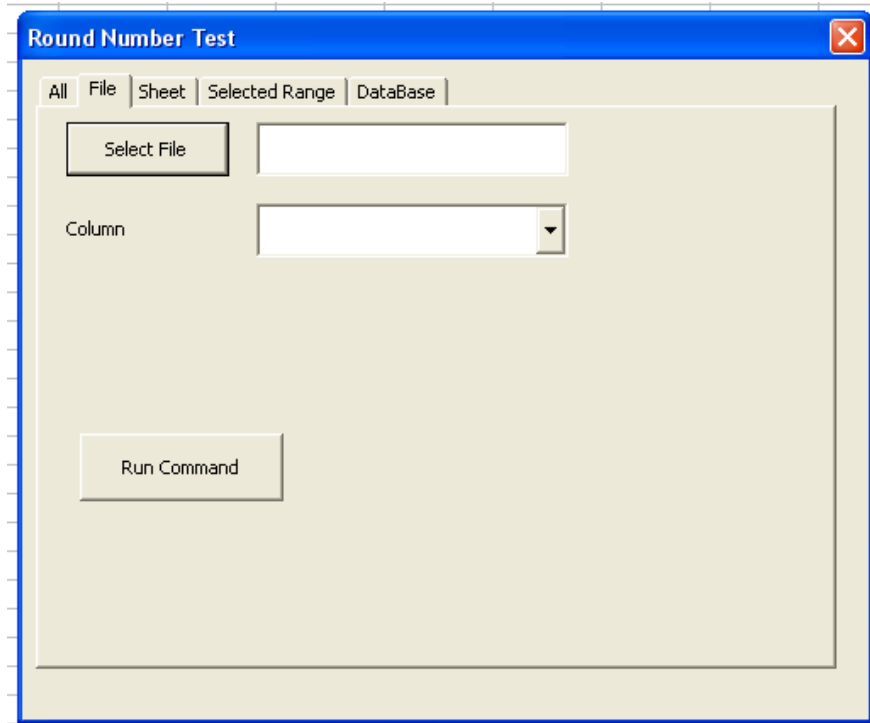
Note that had no range been selected, then no column names would be included in the drop down list. At this point, we can click the command button “Run Command”. This will cause the menu dialog box to disappear and the XL Audit Command toolbar to be filled and displayed for processing, as shown below:



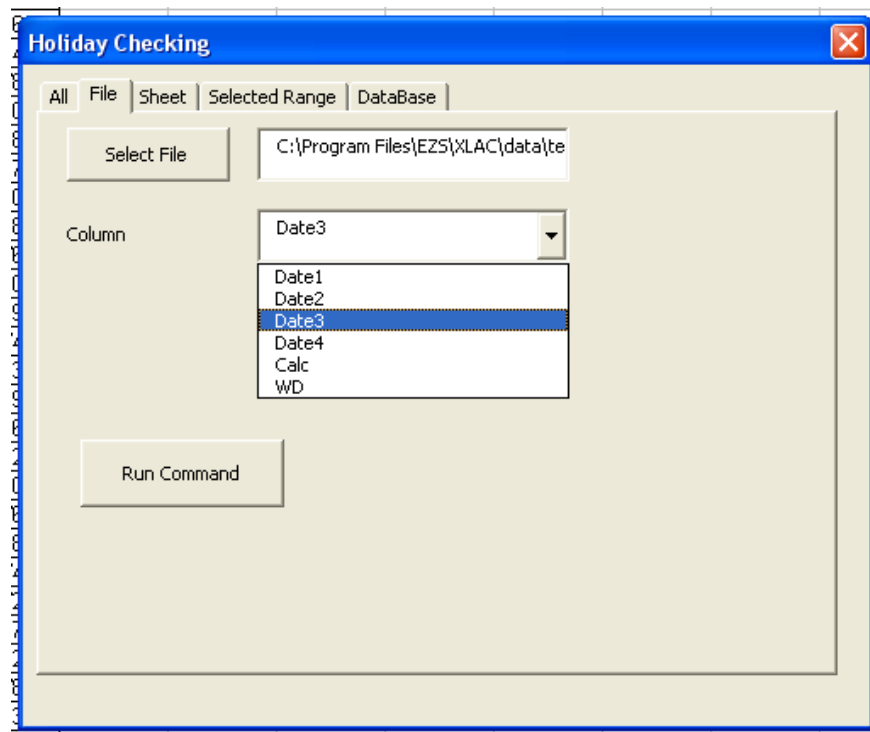
Clicking the “Process” button will result in the analysis being written to the sheet “Res”.

Holiday date analysis can also be performed based upon a file or a database. The basic concepts are the same. To process a file, either type the file name in, or else, click on the “Find File” button. Then select the column name and the destination sheet. A screenshot is shown below:

Procedural steps

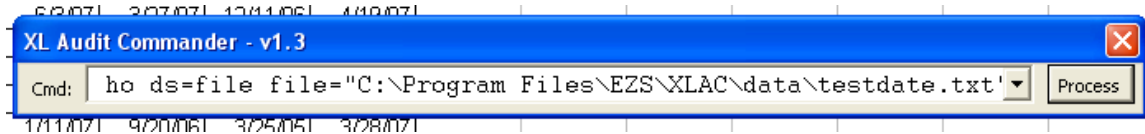


In this case, we select the test date file that is provided with the installation (testdate.txt):



Procedural steps

Clicking the “Run Command” button results in the menu dialog being hidden and the command bar displayed for processing:



The results are as follows:

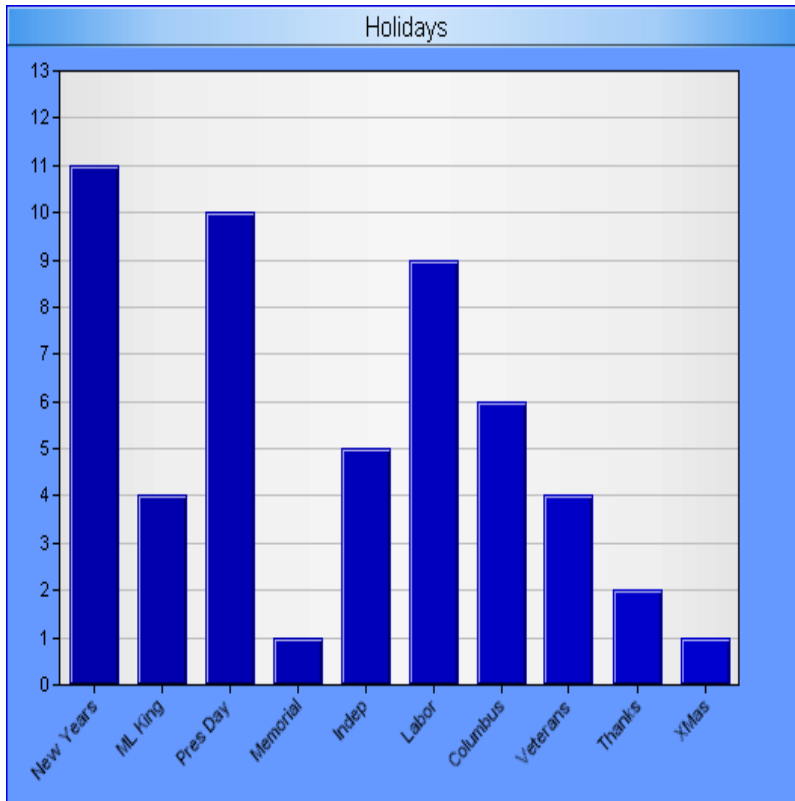
Holiday
Report:

Holiday	Date1	Date2	Date3	Date4	Calc	WD
7/5/2004	1/31/2005	1/27/2005	7/5/2004	8/22/2003	TRUE	2
7/5/2004	5/24/2002	10/9/2002	7/5/2004	11/23/2005	FALSE	2
1/2/2006	12/11/2002	8/4/2002	1/2/2006	11/18/2003	TRUE	2
10/13/2003	8/3/2005	6/30/2002	10/13/2003	6/17/2004	TRUE	2
12/24/2004	7/15/2004	3/17/2003	12/24/2004	6/1/2005	TRUE	6
7/4/2005	10/8/2002	3/12/2003	7/4/2005	12/20/2003	FALSE	2
2/20/2006	6/14/2003	8/16/2003	2/20/2006	10/26/2004	FALSE	2

A total of 49 seven holidays were identified. The command status is shown on the application status bar and indicates that processing took .1 of a second.

Example output from another data source is shown in the chart below, which is included in the workbook from which the tests are being performed.

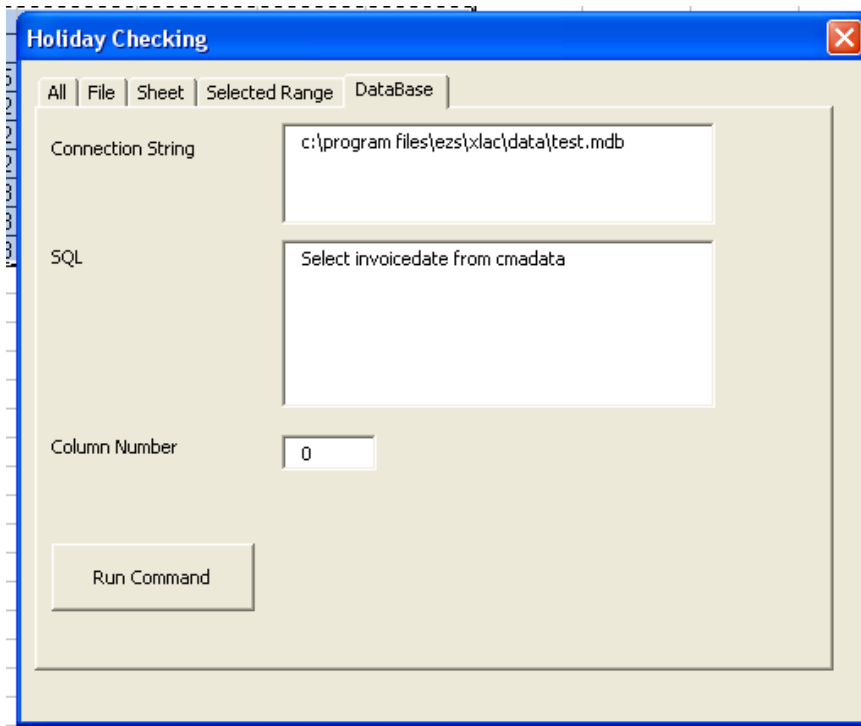
Procedural steps



In this instance, of the 5,973 dates checked, an instance of each of the federal holidays was identified. The process took 1.2 seconds, a little quicker than most auditors could perform the same task!

For a database application we will use the application provided which is an MS Access database.

Procedural steps



The toolbar command is as follows:

```
ho ds=db conn="c:\program files\ezs\xlac\data\test.mdb" sql="Select  
invoicedate from cmadata" recap="Res" colno="0"
```

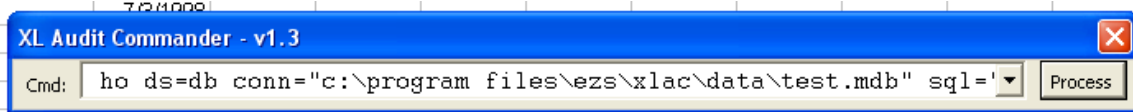
Note that the fldno parameter is the sequence number of the column to be tested in the SQL statement, and that the numbering starts at 0.

The resulting report appears as follows (there is more, which is not shown)

Procedural steps

Holiday Report	
	11/11/1987
	2/15/1988
	2/15/1988
	5/30/1988
	1/1/1990
	11/12/1990
	7/4/1991
	7/4/1991
	7/4/1991
	7/4/1991
	9/2/1991
	9/2/1991
	9/2/1991
	1/1/1992
	11/11/1992
	9/6/1993
	9/6/1993
	9/6/1993
	1/2/1995
	10/9/1995
	10/9/1995
	1/1/1996

The command bar alternative is to use just the command bar and type the commands directly. An example is shown below



Related Areas of Interest

Other related documents/guides of possible interest include:

Topic	Description
Auditing Data in Access	An easier way to perform 18 audit tests on data in Microsoft Access®
http://ezrstats.com/online/AuditGuide/Auditing Data in MS Access Databases.pdf	
Auditing	18 audit tests for data stored in Excel worksheets

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Data in Worksheets	
http://ezrstats.com/online/AuditGuide/Auditing_Data_in_Workbooks.pdf	
Auditing Data in Files	18 audit tests to perform on data files in tab separated value format
http://ezrstats.com/online/AuditGuide/Auditing_Data_in_Files.pdf	
Round Numbers	Why to check for "round" numbers and how
http://ezrstats.com/online/AuditGuide/Testing_For_Round_Numbers.pdf	
Holidays	Identification of holiday dates, e.g. in Journal entries, invoices, etc.
http://ezrstats.com/online/AuditGuide/Testing_For_Holidays.pdf	
Data Stratification	Stratification as a planning and audit tool
http://ezrstats.com/online/AuditGuide/Procedures_For_Data_Stratification.pdf	
Cross tabulations	Use of cross tabulations in audits
http://ezrstats.com/online/AuditGuide/Cross_Tabulations_As_An_Audit_Technique.pdf	
Benford's law	Test conformity with Benford's Law
http://ezrstats.com/doc/Auditors_Guide_to_Tests_using_Benford's_Law.pdf	
Basic Data Extraction	Extracting data based upon criteria, and performing calculations
http://ezrstats.com/online/AuditGuide/Basic_Data_Extraction_Techniques.pdf	
Data Classification	Basic techniques for classifying data Software Installation
http://ezrstats.com/online/AuditGuide/Basic_Data_Classification_Procedures.pdf	
Setup.exe	Setup file - double click to install (6.0 MB)
http://ezrstats.com/online/inno/XLACSetup.exe	
Install Instructions	Installation Guide (PDF document) (.7 MB)
http://ezrstats.com/online/inno/XL_Audit_Commander_Installation_Guide.pdf	
Operation Guide	Operation Guide (PDF document) (2.5 MB)
http://ezrstats.com/online/inno/XL_Audit_Commander.pdf	
Quick Start	Quick Start Module (Excel Workbook - open after install) (3.1 MB)
http://ezrstats.com/online/inno/QS.xls	
Help	Shows list of help links in the current workbook
http://ezrstats.com/helpxlac/he.php	
Single Commands	Commands of just two letters for a selected range on a single worksheet
http://ezrstats.com/helpxlac/single.php	
Population	Population statistics (univariate, stratify, population, duplicates)
http://ezrstats.com/helpxlac/ndxpop.php	
Sampling	Sampling procedures (cma, interval, sample size calculation, precision calculation)

Procedural steps

http://ezrstats.com/helpxlac/ndxsamp.php	
Fraud	Fraud investigation tools (test Benford's Law, duplicates)
http://ezrstats.com/helpxlac/ndxfraud.php	
Cash Recovery	Cash Recovery procedures ("Near miss" invoices, split invoices)
http://ezrstats.com/helpxlac/ndxcr.php	
Other	Other Commands (ageing, gaps, credit card validation, analytic review procedures, dates on federal holidays, etc.)
http://ezrstats.com/helpxlac/ndxoth.php	

Summary and conclusion

Testing for holidays should be a common audit procedure, especially when the data to be tested has already been converted to electronic format. The procedure should not take long, and may yield some interesting results for follow-up!

There are a host of other audit procedures which may also be of interest. There is an index to the procedures at <http://ezrstats.com/helpxlac/index.php>. Software and documentation can be downloaded from <http://ezrstats.com/online/inno/XLACSetup.exe>, and from http://ezrstats.com/online/inno/XL_Audit_Commander.pdf.