



# AUDITING GOVERNMENT DEPARTMENTS

Automating the Process with VBA

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Final Project

# EXECUTIVE SUMMARY

## Description of Business

The Office of the Utah State Auditor is a state government department responsible for auditing the financial statements of various departments of the State and the public universities in the state of Utah. The Office is performs financial audits, performance audits, and special projects. The financial audit division performs financial statement and internal control audits for all the State departments, agencies, and colleges. The performance audit division audits agency programs and evaluates the effectiveness of their operations. The special projects division performs audits based on requests from citizens.

When I did a sample audit at the Office, I compared the records of the purchasing department with the accounting department to look for discrepancies between capital assets in the accounting department records and capital assets in the purchasing department records.

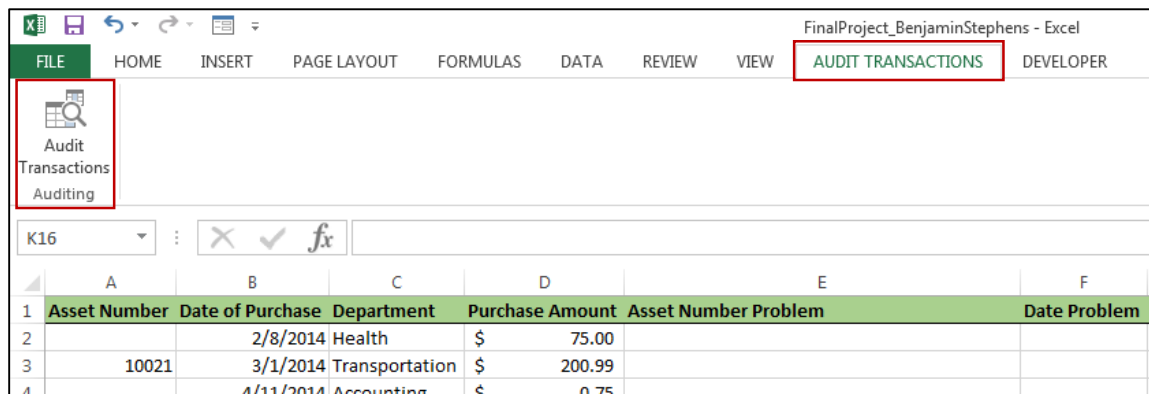
## Overview of System

The program that I have created automates the process that I did by hand when I did a sample audit at the Office. A user puts the transactions from the current year on two preformatted sheets (one from purchasing and one from accounting) after exporting them from the respective department databases. The user is then able to click a few buttons and immediately see all of the problems with the transactions. The user can audit capital asset numbers and find items that should be classified as capital assets that are not, duplicates in the departments, items that should not be classified as capital assets that are, items that are not in the other department that should be, and items with invalid asset numbers. Auditing dates finds items that have the same asset number in both departments, but different dates, and finds invalid dates. Auditing departments finds items that have the same asset number in both departments, but different departments, and finds invalid departments. Auditing historical amounts finds items that have the same asset number in both departments, but different historical amounts, and finds invalid amounts. Finally, auditing for risky items finds items that have a higher risk of being misstated. After clicking the auditing buttons, transactions that are problems or potential problems are marked, and a summary report of the number and types of problems is displayed in aesthetic graphical form. The objective is to speed up the auditing process by automating the audit of most items, and pointing out potential problems for the auditor to think about.

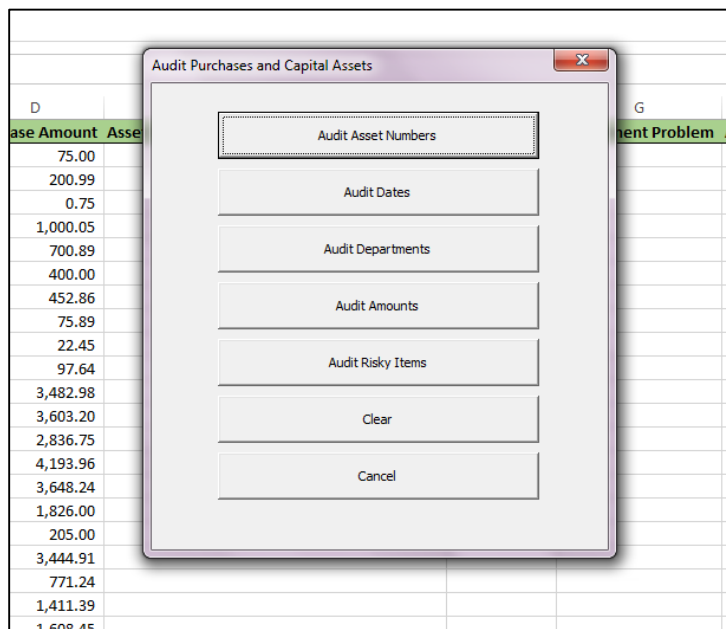


The exported data is assumed to have 4 attributes per transaction, Asset Number, Date of Purchase, Department, and Amount, in that order. The user can export as many transactions that can fit on a single spreadsheet, and the attributes data fields can have any data in them, including blanks.

Once the transactions have been exported, the user then clicks on the AUDIT TRANSACTIONS tab on the excel ribbon, and clicks the “Audit Transactions” button as shown below.



The user then is shown a form with options for auditing different details of the transactions and a clear and cancel button as shown below.



When the User Form shows up, the program has already deleted all charts and cleared all marks on transactions. In addition, the only blanks in the transactions that are allowed are on the “Purchases in 2014” sheet under the “Asset Number” column heading. All other blanks in the transactions are filled with 0 or January 0, 1900, and all error values in the transactions are filled with 0. An example from the “Purchases in 2014” sheet is shown below.

Before User Form.

	A	B	C	D	E	F
147		7/19/2014	Agriculture	\$ 13.64		
148		1/22/2014	Education	\$ 17.49		
149		1/24/2014	Legal	\$ 12.56		
150		10/13/2014	Legal	\$ 17.46		
151	10228	12/31/2014	Education	\$ 6,500.00		
152	10229	12/31/2014	Commerce	\$ 1,025.99		
153	10230	12/31/2015	Health	\$ 1,075.98		
154	10231	12/31/2014	Accounting	\$ 10,002.99		
155	1709		#DIV/0!	#DIV/0!		
156						

After User Form.

	A	B	C	D	
147		7/19/2014	Agriculture	\$ 13.64	
148		1/22/2014	Education	\$ 17.49	
149		1/24/2014	Legal	\$ 12.56	
150		10/13/2014	Legal	\$ 17.46	
151	10228	12/31/2014	Education	\$ 6,500.00	
152	10229	12/31/2014	Commerce	\$ 1,025.99	
153	10230	12/31/2015	Health	\$ 1,075.98	
154	10231	12/31/2014	Accounting	\$ 10,002.99	
155	1709	1/0/1900	0	\$ -	
156					

Audit As

Aud

Audit D

Audi

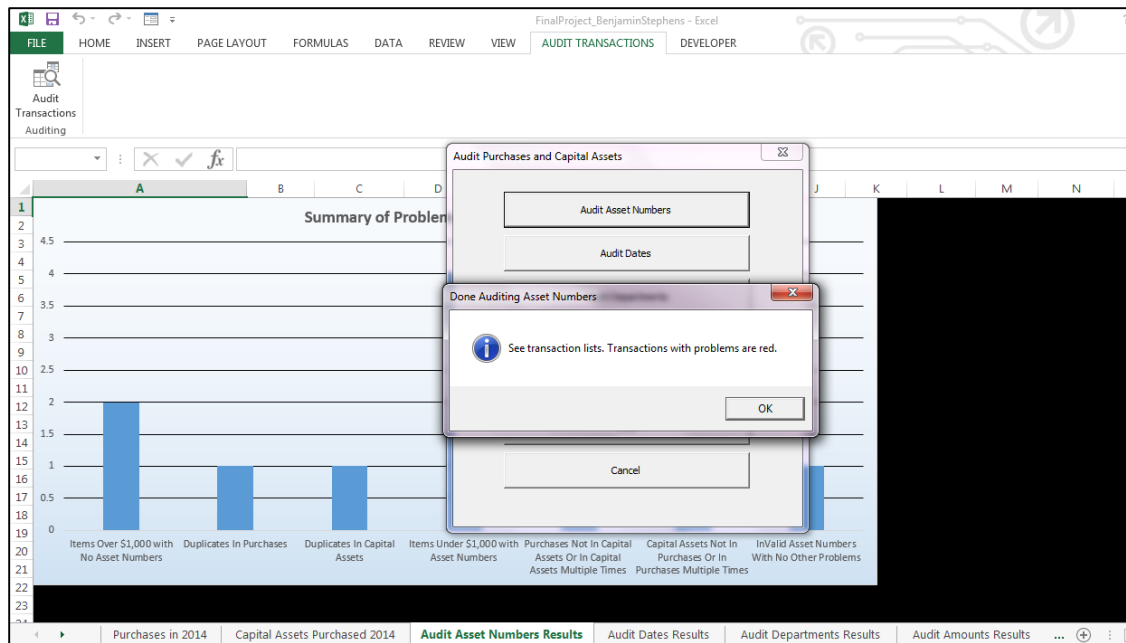
Audit

These controls make the program more robust. The values under the “Asset Number” column on the “Purchases in 2014” sheet are supposed to be blank if the purchase is under \$1,000. The program is designed to stop auditing line items after the last exported transaction. Blanks and error values are corrected every time the user clicks an auditing or a clear button as well.

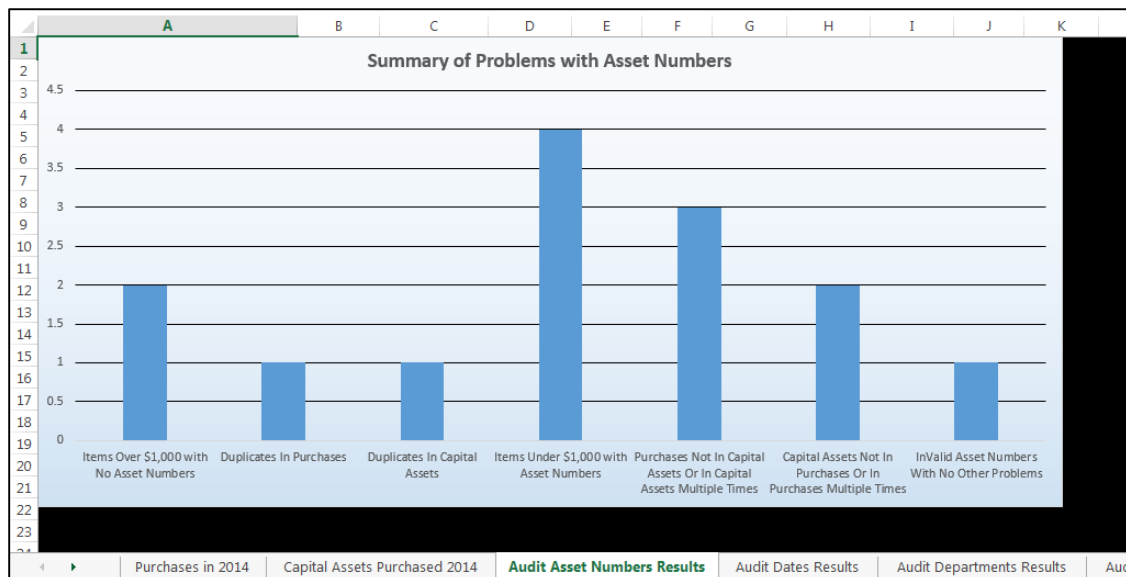
The “Clear” button clears all charts and markings on transactions, and the “Cancel” button hides the user form. The main buttons are discussed next.

## Audit Asset Numbers

Now that the transaction data is set up, the user can click the “Audit Asset Numbers” button. The program runs an audit of the asset numbers and displays a chart describing the number and types of problems found in the audit on the “Audit Asset Number Results” sheet. After clicking the button, the following screen is shown.



When the user clicks “OK” the user can see a summary chart showing the number of various types of problems with asset numbers.



The problems with asset numbers are described as follows:

- Items over \$1,000 with no asset number
  - Purchases over \$1,000 should have asset numbers and be included in the Capital Asset records. Purchases that are not over \$1,000 are counted here.
- Duplicates in Purchases
  - Each transaction with an asset number should have a unique asset number in Purchases. If there are 2 transactions with the same asset number, that counts as 1 duplicate.

- Duplicates in Capital Assets
  - Each transaction should have a unique asset number in Capital Assets. If there are 2 transactions with the same asset number, that counts as 1 duplicate.
- Items under \$1,000 with asset numbers
  - Only transactions with \$1,000 or more should have asset numbers. Items with asset numbers without \$1,000 or more are counted here.
- Purchases not in Capital Assets or in Capital Assets multiple times
  - Any Purchases transaction with an asset number should be in Capital Assets once and only once. If there are any duplicates in Assets, the Purchases transaction corresponding to the duplicates in Assets is counted here. Also, asset numbers in Purchases that are not in Capital Assets are counted here.
- Capital Assets not in Purchases or in Purchases multiple times
  - Any Capital Asset transaction should be in Purchases once and only once. If there are any duplicates in Assets, the Purchases transaction corresponding to the duplicates in Assets is counted here. Also, asset numbers in Capital Assets that are not in Purchases are counted here.
- Invalid asset numbers with no other problems
  - If a transaction is marked, it is assumed that the auditor will look at the transaction carefully. Counting invalid asset numbers that were not already flagged in other types of errors would not be useful because if an asset number is invalid, it has a higher likelihood of not being in the other records anyways. Because this is not real data, I just assumed that asset numbers between 10200 and 10300 were valid asset numbers.

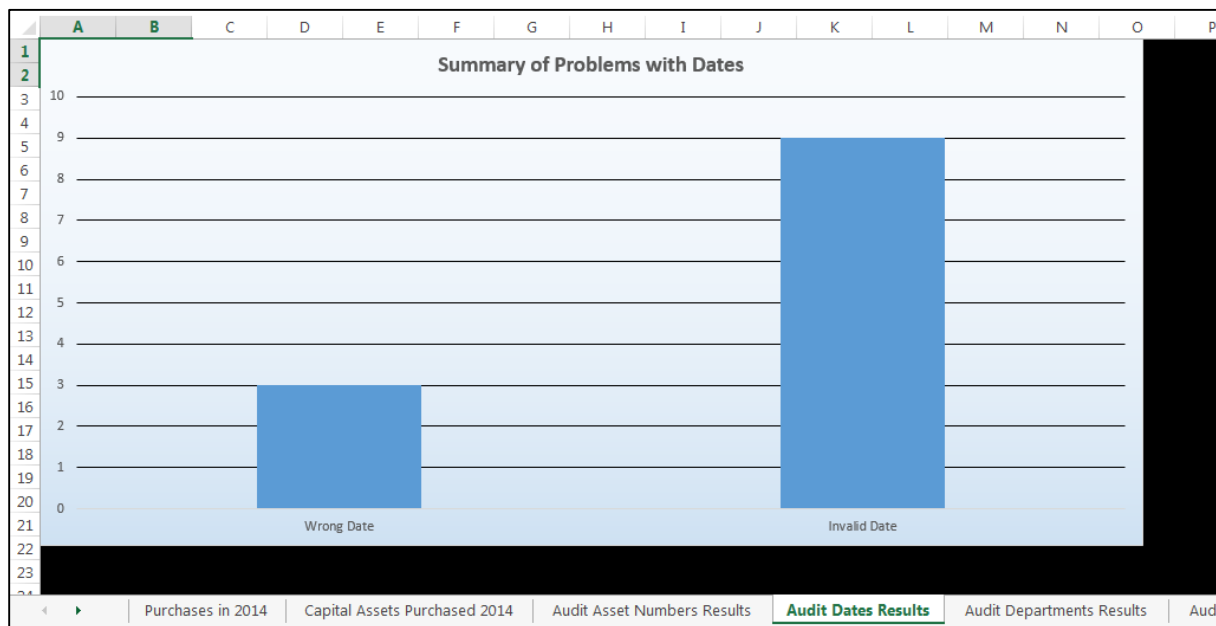
Next, the user can view the transactions sheets to look at specific transactions that had errors. Transactions that had problems with asset numbers are marked in red with the reason for being flagged given in the column labeled “Asset Number Problem” on each sheet. An example from the Capital Assets is shown below.

Audit Transactions Auditing						
LB : ✕ ✓ $\sum$						
	A	B	C	D	E	F
1	Asset Number	Date of Purchase	Department	Historical Cost	Asset Number Problem	Date Problem De
2	10200	1/4/2014	Agriculture	\$ 3,444.91		
3	10201	1/7/2014	Accounting	\$ 1,245.12		
4	10203	2/22/2014	Accounting	\$ 3,403.28		
5	10202	2/22/2014	Health	\$ 1,411.39		
6	10204	4/7/2014	Education	\$ 1,368.48		
7	10206	4/9/2014	Commerce	\$ 1,826.00		
8	10205	4/10/2014	Transportation	\$ 17,485.59		
9	10207	4/9/2014	Purchasing	\$ 13,596.89		
10	10208	4/19/2014	Purchasing	\$ 2,836.75	Duplicate	
11	10209	4/19/2014	Transportation	\$ 1,044.45		
12	10210	5/10/2014	Health	\$ 29,324.00		
13	10211	5/23/2014	Legal	\$ 3,607.78		
14	10208	4/19/2014	Health	\$ 2,836.75	Duplicate	
15	10213	6/4/2014	General	\$ 4,193.96		
16	10214	7/27/2014	Health	\$ 1,000.05		
17	10215	9/1/2014	Commerce	\$ 45,259.68		
18	10216	9/5/2014	Commerce	\$ 3,648.24		
19	10217	9/11/2014	Agriculture	\$ 1,928.34		
20	10218	10/9/2014	Purchasing	\$ 2,403.26		
21	10219	9/13/2014	Agriculture	\$ 7,595.49	In Purchases Multiple Times or Not At All	
22	10220	9/17/2014	Health	\$ 4,461.49	In Purchases Multiple Times or Not At All	
23	10221	12/8/2014	Commerce	\$ 700.00	Under \$1,000	
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results						

The auditing of asset numbers has flagged all potential errors with asset numbers with the click of a button. Now the auditor can spend more time investigating the transactions with errors and the internal controls related to the specific transactions.

## Audit Dates

When the user clicks the “Audit Dates” button on the user form, the program runs an audit of the dates and displays a chart describing the number and types of problems found in the audit on the “Audit Dates Results” sheet. After clicking the button, the same message notifying the auditor that the transactions with errors are marked in red on the transactions lists pops up. In addition, the following chart is displayed.



The problems with dates are described as follows:

- **Wrong Date**
  - If an item in the Purchases records has the same asset number as an item in the Capital Asset records, and those transactions do not have the same dates, this counts as 1 count for a wrong date. The item may be a duplicate or have an invalid date as well, but the instance is recorded here too.
- **Invalid Date**
  - Because the current year is 2014, only transactions from the year 2014 are valid. If a transaction does not have a valid date in 2014, then it is counted here.

Next, the user can view the transactions sheets to look at specific transactions that had errors. Transactions that had problems with dates are marked in red with the reason for being flagged given in the column labeled “Date Problem” on each sheet. An example from the Purchases is shown below. The example shows an instance when the user has audited asset numbers and then dates and the transactions flagged for asset number errors are still marked, but it is not a requirement to audit asset numbers before auditing dates.



Audit Transactions Auditing							
J45							
Asset Number	Date of Purchase	Department	Purchase Amount	Asset Number Problem	Date Problem	Department Problem	
	4/19/2014	Health	\$ 4.75				
10222	12/14/2001	Agriculture	\$ 79,463.14		Invalid Date		
10210	5/10/2014	Health	\$ 29,324.00				
	10/3/2014	Legal	\$ 100.20				
	7/19/2014	Commerce	\$ 829.46				
10207	4/9/2014	Purchasing	\$ 13,596.89				
	1/11/2014	Legal	\$ 100.89				
10219	9/13/2014	Agriculture	\$ 7,595.49	Duplicate			
10215	9/1/2014	Commerce	\$ 45,259.68				
	17/4/2014	Commerce	\$ 204.70		Invalid Date		
	9/23/2014	Agriculture	\$ 6.00				
10219	9/17/2014	Health	\$ 4,461.49	Duplicate	Wrong Date		
10221	12/8/2014	Commerce	\$ 2,525.59				
	5/7/2014	Purchasing	\$ 20.99				
10218	10/9/2014	Purchasing	\$ 2,403.26				
10211	5/23/2014	Legal	\$ 3,607.78				
	7/3/2014	Commerce	\$ 789.36				
10205	4/7/2014	Transportation	\$ 17,485.59		Wrong Date		
	7/23/2014	Legal	\$ 484.00				
	1/20/2014	Legal	\$ 617.00				
	7/15/2014	Accounting	\$ 850.00				
7005	7/31/2014	Purchasing	\$ 3.49	Under \$1,000			

To see how the audit is working with both sheets, the next screen shows the wrong date marked for asset numbers 10219 and 10205 on the Capital Asset records as these were marked above in the Purchases records. Note also that the asset numbers audit is working with both sheets and marking asset number 10219 in the Capital Asset records as a duplicate in Purchases.

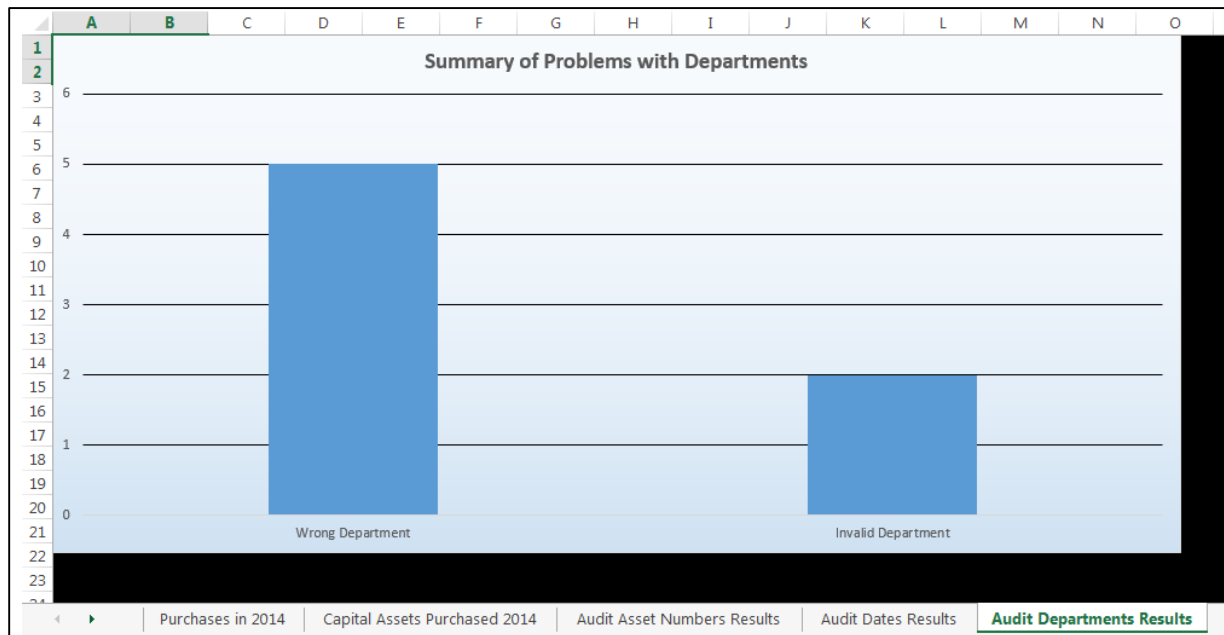
Preview Layout Views							
Workbook Views							
J15							
Asset Number	Date of Purchase	Department	Historical Cost	Asset Number Problem	Date Problem	Department Problem	
10200	1/4/2014	Agriculture	\$ 3,444.91				
10201	1/7/2014	Accounting	\$ 1,245.12				
10203	2/22/2014	Accounting	\$ 3,403.28				
10202	2/22/2014	Health	\$ 1,411.39				
10204	4/7/2014	Education	\$ 1,368.48				
10206	4/9/2014	Commerce	\$ 1,826.00				
10205	4/10/2014	Transportation	\$ 17,485.59		Wrong Date		
10207	4/9/2014	Purchasing	\$ 13,596.89				
10208	4/19/2014	Purchasing	\$ 2,836.75	Duplicate			
10209	4/19/2014	Transportation	\$ 1,044.45				
10210	5/10/2014	Health	\$ 29,324.00				
10211	5/23/2014	Legal	\$ 3,607.78				
10208	4/19/2014	Health	\$ 2,836.75	Duplicate			
10213	6/4/2014	General	\$ 4,193.96				
10214	7/27/2014	Health	\$ 1,000.05				
10215	9/1/2014	Commerce	\$ 45,259.68				
10216	9/5/2014	Commerce	\$ 3,648.24				
10217	9/11/2014	Agriculture	\$ 1,928.34				
10218	10/9/2014	Purchasing	\$ 2,403.26				
10219	9/13/2014	Agriculture	\$ 7,595.49	In Purchases Multiple Times or Not At All	Wrong Date		
10220	9/17/2014	Health	\$ 4,461.49	In Purchases Multiple Times or Not At All			
10221	12/8/2014	Commerce	\$ 700.00	Under \$1,000			

The auditing of dates has flagged all potential errors with dates with the click of a button. Now the auditor can spend more time investigating the transactions with errors and the internal controls related to the specific transactions.

## Audit Departments

When the user clicks the “Audit Departments” button on the user form, the program runs an audit of the departments and displays a chart describing the number and types of problems found

in the audit on the “Audit Departments Results” sheet. After clicking the button, the same message notifying the auditor that the transactions with errors are marked in red on the transactions lists pops up. In addition, the following chart is displayed.



The problems with departments are described as follows:

- **Wrong Department**
  - If an item in the Purchases records has the same asset number as an item in the Capital Asset records, and those transactions do not have the same departments, this counts as 1 count for a wrong department. The item may be a duplicate or have an invalid department as well, but the instance is recorded here too.
- **Invalid Department**
  - The only valid departments are Agriculture, Accounting, Commerce, Education, Health, Legal, Transportation, and Purchasing. If any transactions have any departments other than these, they are counted in the invalid departments transactions.

Next, the user can view the transactions sheets to look at specific transactions that had errors. Transactions that had problems with departments are marked in red with the reason for being flagged given in the column labeled “Department Problem” on each sheet. An example from the Capital Asset records is shown below.

Audit Transactions Auditing								
K1								
	A	B	C	D	E	F	G	
1	Asset Number	Date of Purchase	Department	Historical Cost	Asset Number Problem	Date Problem	Department Problem	Amount
2	10200	1/4/2014	Agriculture	\$ 3,444.91				
3	10201	1/7/2014	Accounting	\$ 1,245.12				
4	10203	2/22/2014	Accounting	\$ 3,403.28			Wrong Department	
5	10202	2/22/2014	Health	\$ 1,411.39				
6	10204	4/7/2014	Education	\$ 1,368.48				
7	10206	4/9/2014	Commerce	\$ 1,826.00				
8	10205	4/10/2014	Transportation	\$ 17,485.59				
9	10207	4/9/2014	Purchasing	\$ 13,596.89				
10	10208	4/19/2014	Purchasing	\$ 2,836.75				
11	10209	4/19/2014	Transportation	\$ 1,044.45				
12	10210	5/10/2014	Health	\$ 29,324.00				
13	10211	5/23/2014	Legal	\$ 3,607.78				
14	10208	4/19/2014	Health	\$ 2,836.75			Wrong Department	
15	10213	6/4/2014	General	\$ 4,193.96			Invalid Department	
16	10214	7/27/2014	Health	\$ 1,000.05				
17	10215	9/1/2014	Commerce	\$ 45,259.68				
18	10216	9/5/2014	Commerce	\$ 3,648.24				
19	10217	9/11/2014	Agriculture	\$ 1,928.34				
20	10218	10/9/2014	Purchasing	\$ 2,403.26				
21	10219	9/13/2014	Agriculture	\$ 7,595.49			Wrong Department	
22	10220	9/17/2014	Health	\$ 4,461.49				
23	10221	12/8/2014	Commerce	\$ 700.00				
24	10222	12/14/2014	Education	\$ 30,422.44				
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results Audit Departments Results								

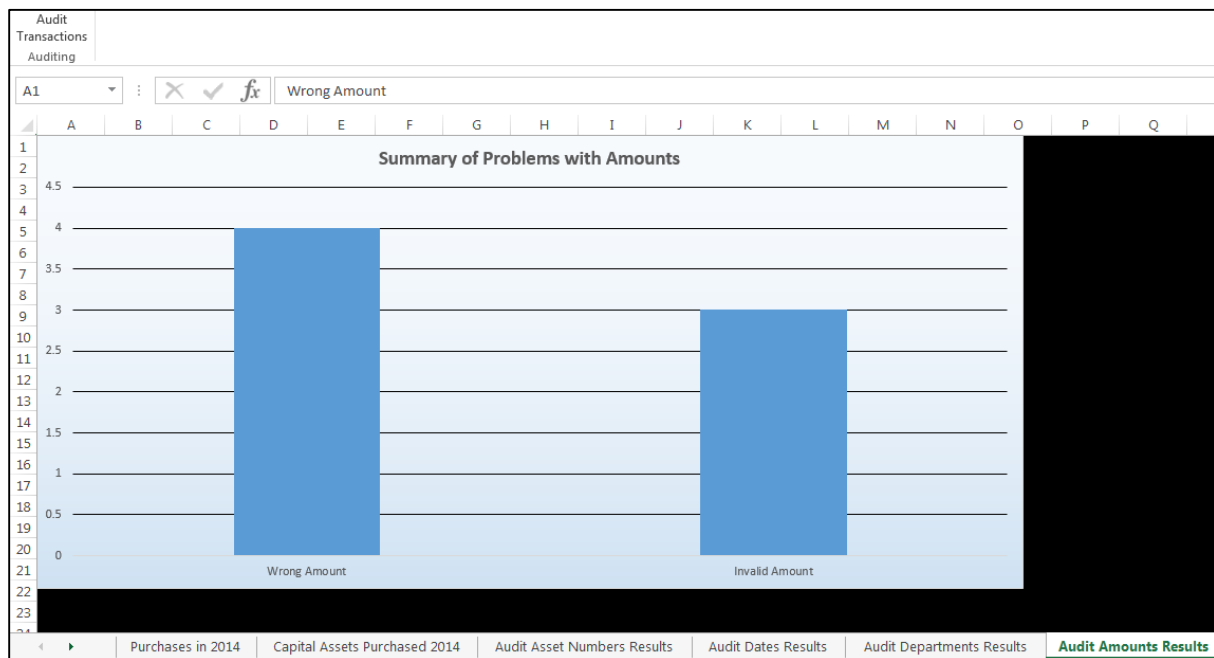
To see how the audit is working with both sheets, the next screen shows the wrong department marked for asset numbers 10203 and 10213 on the Purchases records as these were marked above in the Capital Asset records. Note that asset number 10213 has an invalid department in the Capital Asset records, but a valid department in the Purchases records, and the wrong department only needs to be marked once because the other transaction has an invalid department.

Audit Transactions Auditing								
K20								
	A	B	C	D	E	F	G	
8		10/21/2014	Education	\$ 452.86				
9		5/25/2014	Health	\$ 75.89				
10		4/16/2014	Legal	\$ 22.45				
11		1/9/2014	Agriculture	\$ 97.64				
12	10223	12/26/2014	Agriculture	\$ 3,482.98				
13	10212	6/4/2014	Health	\$ 3,603.20				
14	10208	4/19/2014	Purchasing	\$ 2,836.75			Wrong Department	
15	10213	6/4/2014	Health	\$ 4,193.96			Wrong Department	
16	10216	9/5/2014	Commerce	\$ 3,648.24				
17	10206	4/9/2014	Commerce	\$ 1,826.00				
18		6/4/2014	Transportation	\$ 205.00				
19	10200	1/4/2014	Agriculture	\$ 3,444.91				
20		2/14/2014	Transportation	\$ 771.24				
21	10202	2/22/2014	Health	\$ 1,411.39				
22		2/12/2014	Agriculture	\$ 1,608.45				
23	10203	2/22/2014	Legal	\$ 3,403.28			Wrong Department	
24	10217	9/11/2014	Agriculture	\$ 1,928.34				
25		10/3/2014	Education	\$ 100.42				
26		9/7/2014	Health	\$ 25,798.54				
27		5/21/2014	Accounting	\$ 681.89				
28		2/22/2014	Education	\$ 115.14				
29		2/6/2014	Transportation	\$ 160.69				
30		1/4/2014	Transportation	\$ 144.48				
31		5/15/2014	Education	\$ 30,500.00				
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results Audit Departments Results								

The auditing of departments has flagged all potential errors with departments with the click of a button. Now the auditor can spend more time investigating the transactions with errors and the internal controls related to the specific transactions.

## Audit Amounts

When the user clicks the “Audit Amounts” button on the user form, the program runs an audit of the amounts and displays a chart describing the number and types of problems found in the audit on the “Audit Amounts Results” sheet. After clicking the button, the same message notifying the auditor that the transactions with errors are marked in red on the transactions lists pops up. In addition, the following chart is displayed.



The problems with amounts are described as follows:

- **Wrong Amount**
  - If an item in the Purchases records has the same asset number as an item in the Capital Asset records, and those transactions do not have the same amounts, this counts as 1 count for a wrong amount. The item may be a duplicate or have an invalid amount as well, but the instance is recorded here too.
- **Invalid Department**
  - Transactions that do not have amounts greater than 0 are invalid.

Next, the user can view the transactions sheets to look at specific transactions that had errors. Transactions that had problems with amounts are marked in red with the reason for being flagged given in the column labeled “Amount Problem” on each sheet. An example from the Capital Asset records is shown below.

Audit Transactions Auditing									
K1									
	A	B	C	D	E	F	G	H	
1	Asset Number	Date of Purchase	Department	Historical Cost	Asset Number Problem	Date Problem	Department Problem	Amount Problem	
15	10213	6/4/2014	General	\$ 4,193.96					
16	10214	7/27/2014	Health	\$ 1,000.05					
17	10215	9/1/2014	Commerce	\$ 45,259.68					
18	10216	9/5/2014	Commerce	\$ 3,648.24					
19	10217	9/11/2014	Agriculture	\$ 1,928.34					
20	10218	10/9/2014	Purchasing	\$ 2,403.26					
21	10219	9/13/2014	Agriculture	\$ 7,595.49				Wrong Amount	
22	10220	9/17/2014	Health	\$ 4,461.49					
23	10221	12/8/2014	Commerce	\$ 700.00				Wrong Amount	
24	10222	12/14/2001	Agriculture	\$ 79,463.14					
25	10223	12/26/2014	Agriculture	\$ 3,482.98					
26	10226	12/27/2014	Purchasing	\$ 75,889.34					
27	10227	12/30/2014	Education	\$ 4,596.19					
28	4957	12/27/2014	Health	\$ 1,598.78					
29	10228	12/31/2014	Health	\$ 5,000.00				Wrong Amount	
30	10229	12/31/2014	Commerce	\$ 1,025.99					
31	10231	12/31/2014	Accounting	\$ (5,000.00)				Invalid Amount	
32									
33									
34									
35									
36									
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results Audit Departments Results Audit Amo									

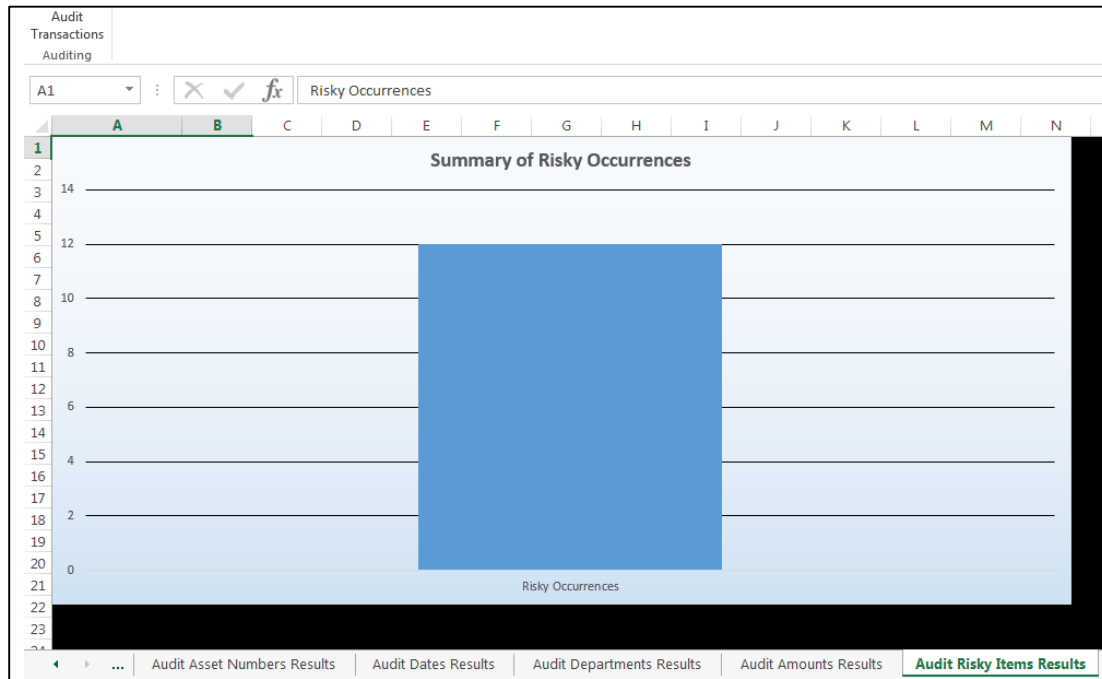
To see how the audit is working with both sheets, the next screen shows the wrong amount marked for asset numbers 10228 and 10231 on the Purchases records as these were marked above in the Capital Asset records. Note that asset number 10231 has an invalid amount in the Capital Asset records, but a valid amount in the Purchases records, and the wrong amount only needs to be marked once because the other transaction has an invalid amount.

Audit Transactions Auditing									
L125									
	A	B	C	D	E	F	G	H	I
1	Asset Number	Date of Purchase	Department	Purchase Amount	Asset Number Problem	Date Problem	Department Problem	Amount Problem	Risky Item
140		8/26/2014	Commerce	\$ 21.39					
141		1/17/2014	Accounting	\$ (17.00)				Invalid Amount	
142		10/24/2014	Commerce	\$ 10.77					
143		4/18/2014	Legal	\$ 78.19					
144		8/26/2014	Agriculture	\$ -				Invalid Amount	
145		10/7/2014	Health	\$ 41.69					
146		5/19/2014	Agriculture	\$ 46.97					
147		7/19/2014	Agriculture	\$ 13.64					
148		1/22/2014	Education	\$ 17.49					
149		1/24/2014	Legal	\$ 12.56					
150		10/13/2014	Legal	\$ 17.46					
151	10228	12/31/2014	Education	\$ 6,500.00				Wrong Amount	
152	10229	12/31/2014	Commerce	\$ 1,025.99					
153	10230	12/31/2015	Health	\$ 1,075.98					
154	10231	12/31/2014	Accounting	\$ 10,002.99				Wrong Amount	
155									
156									
157									
158									
159									
160									
161									
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results Audit Departments Results Audit Amounts Results									

The auditing of amounts has flagged all potential errors with amounts with the click of a button. Now the auditor can spend more time investigating the transactions with errors and the internal controls related to the specific transactions.

## Audit Risky Items

When the user clicks the “Audit Risky Items” button on the user form, the program runs an audit for risky items and displays a chart describing the number of risky transactions on the “Audit Risky Items Results” sheet. After clicking the button, the same message notifying the auditor that the transactions with errors are marked in red on the transactions lists pops up. In addition, the following chart is displayed.



Risky occurrences are defined as purchases on the same day that do not have asset numbers and add up to over \$1,000.

Next, the user can view the Purchases sheet to look at specific transactions that are risky. Transactions that are risky are marked in red and a “YES” is marked in the “Risky Item” column on the Purchases sheet. An example is shown below.

Audit Transactions Auditing										
KS										
	A	B	C	D	E	F	G	H	I	
1	Asset Number	Date of Purchase	Department	Purchase Amount	Asset Number Problem	Date Problem	Department Problem	Amount Problem	Risky Item	
2		2/8/2014	Health	\$ 75.00						
3	10021	3/1/2014	Transportation	\$ 200.99	Under \$1,000					
4		4/11/2014	Accounting	\$ 0.75						
5	10214	7/27/2014	Health	\$ 1,000.05						
6		1/8/2014	Agriculture	\$ 700.89						YES
7		2/6/2014	Commerce	\$ 400.00						
8		10/21/2014	Education	\$ 452.86						
9		5/25/2014	Health	\$ 75.89						
10		4/16/2014	Legal	\$ 22.45						
11		1/9/2014	Agriculture	\$ 97.64						
12	10223	12/26/2014	Agriculture	\$ 3,482.98						
13	10212	6/4/2014	Health	\$ 3,603.20	In Capital Assets Multiple Times or Not At All					
14	10208	4/19/2014	Purchasing	\$ 2,836.75	In Capital Assets Multiple Times or Not At All		Wrong Department			
15	10213	6/4/2014	Health	\$ 4,193.96			Wrong Department			
16	10216	9/5/2014	Commerce	\$ 3,648.24						
17	10206	4/9/2014	Commerce	\$ 1,826.00						
18		6/4/2014	Transportation	\$ 205.00						
19	10200	1/4/2014	Agriculture	\$ 3,444.91						
20		2/14/2014	Transportation	\$ 771.24						
21	10202	2/22/2014	Health	\$ 1,411.39						
22		2/12/2014	Agriculture	\$ 1,608.45	No Asset Number					YES
23	10203	2/22/2014	Legal	\$ 3,403.28			Wrong Department			
24		6/16/2014	Agriculture	\$ 1,000.00						
Purchases in 2014 Capital Assets Purchased 2014 Audit Asset Numbers Results Audit Dates Results Audit Departments Results Audit Amounts Results										

The first purchase marked as risky is marked as such because there are multiple transactions on January 8, 2014 with no asset numbers and all add up to over \$1,000. The second purchase marked as risky is over \$1,000 by itself and has no asset number, which is also captured by the audit of asset numbers.

The auditing of risky items has flagged all potential errors with the click of a button. Now the auditor can spend more time investigating the transactions that are more risky to see if they actual are errors.

## DISCUSSION OF LEARNING AND CONCEPTUAL DIFFICULTIES ENCOUNTERED

The only element that I wanted to include but I could not, is that I was not able to have access to actual data from the various government information systems to use this project on. There was nothing I could do about that.

### Discussion of Learning

One main learning point from this project was developing the skill to search the internet for coding for a particular situation, and applying general syntaxes to specific situations in order to achieve the desired results. The code I used from referencing sites such as stackoverflow.com was not specific enough to warrant citation as I just used the general code syntax and applied it to my specific situation.

From doing this project, I gained some more experience in looking for ways to make the code more robust. In writing the code, I tried to think about ways that the exported data could be corrupted by the user that would make my code not run. I came up with the most likely scenarios

being that either blank cells or error cells. I wrote my code to change blank or error cells in the data to be 0 so that my program would run without interruption or other errors. While figuring out how to write the code to make the program robust, I used resources such as [stackoverflow.com](https://stackoverflow.com) for general coding syntaxes. This was most helpful particularly for the control on cells with errors in them.

Also, I learned how to work with some of the subtleties of coding with charts. The textbook for this class was not very helpful in teaching me how to name charts in VBA, and I was struggling to figure out how to make it so that each code for charting was specific to a named chart. I went to the internet for a resource and found out the difference between chart sheets and embedded charts and realized that I wanted to work with embedded charts for the summary charts of the audits. I found the syntax for naming a chart and where to place the name of the chart in the chart code so that each time the chart code ran, the code would run to the specific chart, instead of a chart that had the order number that corresponded to the order in which charts were added. This was very helpful in adding and deleting charts in my code.

I also learned more about user forms. I wanted to make it so that the user could switch between sheets while the user form was still open, but the default setting on the user form would not allow the user to do so. I searched the internet in order to find the setting that would allow the user to move between sheets, and now the user can move between sheets in order to check the specific transactions that were flagged while still having the user form open.

Finally, I learned how to better deal with multiple loops and if-statements. Most of the usefulness of using VBA to automate tasks seems to stem from its ability to use logic constructs and loops. In my project, there were many aspects that needed to be audited in each particular audit. The if-statements and the loops quickly became complicated as there were multiple if-statements and loops nested within each other. I found that tabbing the if-statements and loops to keep them on the same indent was immensely helpful while doing this project and learned to better use this technique to keep things organized.

## Discussion of Difficulties

When I was writing the program to replace error cells within the data with 0, I kept on getting an error every time I would run the code. I looked up several different ways of dealing with the problem, and tried them all, but was still getting an error. Finally, I realized that when I was checking to see if the cell was blank, and the cell was an error, the program would stop. I thought that I could check for a blank cell and then check for an error cell, but I actually needed to put, “on error resume next” in order to make it so that when a cell that contained an error was checked for being blank, the program would not stop. I found this counterintuitive since I was checking for a blank cell and not an error cell, but now the code works with both checking for a blank cell and an error cell.

When I was writing the program to make the summary charts, I ran into the problem that when I recorded the macro to make the chart, the charts would be named after the order number in whichever order they were added. This was not working because the code would reference that particular name later on in the chart set up code. If the chart was not named “chart1,” the code



would not manipulate the chart that I wanted. After a long while of searching through internet resources, I finally figured out that I could name the embedded chart with the “.parent.name” syntax, and then just replace the “chart1” references throughout the rest of the code with the new name of the specific chart. That was difficult to find, but it finally worked.

Also, I could not figure out how to have the ability to switch between sheets while the user form was still open. After some internet searching, I figured out that I needed to switch the “showmodal” user form property equal to false.

Finally, one of the difficulties of this project was keeping all of the nested and intertwined if-statements and loops clear. Even when I started indenting more rigorously, I would find myself having to step through the code and look at each variable value multiple times before I would get the auditing to work. This was not a syntax difficulty, but a logic difficulty. Debugging this code took a long time, especially for the audit of asset numbers, which has the most variables and was the most complicated.

## ASSISTANCE

The only help that I received was from looking up of various code syntaxes for specific problems. The main source was stackoverflow.com, but the code I used from referencing sites was not specific enough to warrant citation because I just used the general code syntax and applied it to my specific situation. The specific areas where I used this assistance is found in the “Discussion of “Difficulties” section.

I did not receive any substantial assistance.