## Executive Summary

One of the most pervasive problems in society today is over spending. People have a major tendency to always spend what they make, no matter how much they make, and oftentimes spend even more. The best solution for anyone that wants to gain control of their spending is maintaining a budget. This project attempts to create a simple solution for anyone that needs to create a basic budget. While it is basic, this project still attempts to be as robust as possible. Beyond the basic feature of entering in expenses and income, this project includes the following: variance analysis through comparison of budgeted and actual amounts, ability to add and remove expense categories, download credit card transactions from a Wells Fargo bank account (and enter them into the expense list), and the ability to include items that would be categorized as savings (e.g. retirement) or giving (e.g. tithing). These features allow a lot more control and flexibility over the budget and provide the user with valuable information to aid them in controlling their costs and managing their savings and charitable contributions.

Anyone is welcome to use this tool, but it is specifically designed for my wife and me to use. Data for October and November have been included to show how the different features work.

Implementation Documentation

The documentation will be organized into several sections, in order of the ribbon groups of the Budget ribbon.
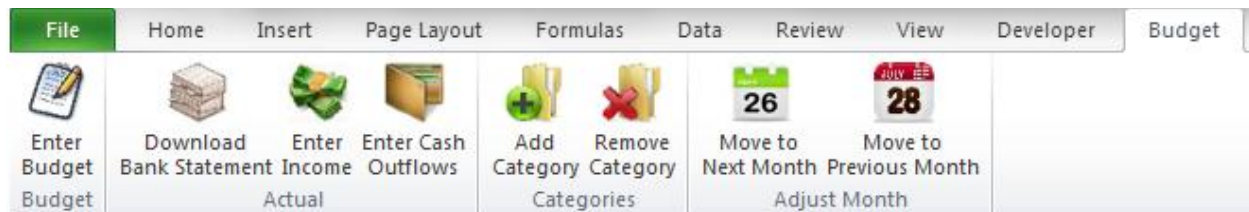
Those groups, and there buttons, are as follows:

- Budget
    - o Enter Budget
- Actual
    - o Download Bank Statement
    - o Enter Income
    - o Enter Cash Outflows
- Categories
    - o Add Category
    - o Remove Category
- Adjust Month
    - o Move to Next Month
    - o Move to Previous Month

Budget

The first part of any budget is to forecast your expected expenses. The first button on the Budget Ribbon is the Enter Budget button. This button brings up a form that allows the user to enter in the budget category, the month and year, and the amount budgeted.

That amount is then entered into the budget in the appropriate cell as highlighted below.

	A	B	C	D	E	F	G
1	Income and Expenses	October 2012 Budget	October 2012 Actual	Variance	November 2012 Budget	November 2012 Actual	Variance
11	Fast Offerings	$20.00	$20.00	$0.00	$30.00	$20.00	($10.00)
12	Savings	$20.00	$0.00	($20.00)	$30.00	$0.00	($30.00)
13	Tithing	$450.00	$457.00	$7.00	$40.00	$50.00	$10.00
14	**Total Saving/Giving**	$490.00	$477.00	($13.00)	$100.00	$70.00	($30.00)
15							
16	**Net after Giving**	$810.00	$1,039.87	$229.87	$975.00	$1,050.00	$75.00
17							
18	**EXPENSES**						
19	Clothing/Hair	$15.00	$15.00	$0.00		$0.00	$0.00
20	Eating Out	$20.00	$18.35	$1.65	$20.00	$15.76	$4.24
21	Fun	$120.00	$140.47	($20.47)	$50.00	$0.00	$50.00
22	Gas	$140.00	$149.87	($9.87)	$240.00	$246.12	($6.12)
23	Groceries	$240.00	$241.89	($1.89)	$100.00	$57.69	$42.31
24	Gym	$75.00	$0.00	$75.00		$0.00	$0.00
25	Insurance/Car	$30.00	$27.85	$2.15		$0.00	$0.00
26	Medical/Health	$10.00	$4.00	$6.00		$0.00	$0.00
27	Misc	$400.00	$476.09	($76.09)		$0.00	$0.00
28	Rent	$605.00	$611.00	($6.00)	$605.00	$567.27	$37.73
29	Renter's Insurance	$20.00	$0.00	$20.00		$0.00	$0.00
30	School	$20.00	$35.45	($15.45)		$0.00	$0.00
31	Travel	$600.00	$602.40	($2.40)	$20.00	$38.00	($18.00)
32	Utilities/Laundry/Rentals	$20.00	$25.00	($5.00)		$0.00	$0.00
33	**Total Expenses**	$2,315.00	$2,347.37	($32.37)	$1,035.00	$924.84	$110.16
34							
35	**Net Remaining**	($1,505.00)	($1,307.50)	$197.50	($60.00)	$125.16	$185.16

Actual

The next group is used for entering in the actual results from the month. These buttons include a button for manually entering in expenses, manually entering in income, and downloading

credit card transactions from a bank account and inputting them into the expense list. Income is entered directly onto the detailed budget as shown below.

	A	E	F	G
1	Income and Expenses	November 2012 Budget	November 2012 Actual	Variance
2				
3	**INCOME**			
4	Jeff's Gross	$650.00	$600.00	($50.00)
5	Jeff's Net	$700.00	$705.00	$5.00
6	EJ's Gross	$320.00	$300.00	($20.00)
7	EJ's Net	$275.00	$300.00	$25.00
8	EJ's tips	$100.00	$115.00	$15.00
9	**Total Net Income**	$1,075.00	$1,120.00	$45.00
10				
11	Fast Offerings	$30.00	$20.00	($10.00)
12	Savings	$30.00	$0.00	($30.00)
13	Tithing	$40.00	$50.00	$10.00
14	**Total Saving/Giving**	$100.00	$70.00	($30.00)
15				
16	**Net after Giving**	$975.00	$1,050.00	$75.00
17				
18	**EXPENSES**			
19	Clothing/Hair		$0.00	$0.00
20	Eating Out	$20.00	$15.76	$4.24
21	Fun	$50.00	$0.00	$50.00
22	Gas	$240.00	$246.12	($6.12)

Actual expenses, however, are entered in a separate spreadsheet (shown below) in a detailed table that allows the user to see each expense item in detail. Those expense items then filter into the detailed budget above using formulas for each expense.

	A	B	C	D	E
1	Description	Category	Amount	Month	Year
2	Rent (accidentally paid it early)	Rent	$567	November	2012
3	Haircut	Clothing/Hair	$15.00	October	2012
4	KK Doughnuts	Eating Out	$4.31	October	2012
5	Pirate O's Adventure	Eating Out	$7.24	October	2012
6	Ikea Food	Eating Out	$4.30	October	2012
7	Hot Chocolate (2)	Eating Out	$2.50	October	2012
8	Fast Offering	Fast Offerings	$20.00	October	2012
9	Ikea stuff for Mom/ frozen meatballs	Fun	$ 36.67	October	2012
10	Quarry Membership	Fun	$ 69.39	October	2012
11	Cut the Rope Phone Ap	Fun	$ 0.99	October	2012
12	Dollar Theatre	Fun	$ 2.00	October	2012
13	Floral Stuff	Fun	$ 31.42	October	2012
14	Gas	Gas	$49	October	2012
15	Gas	Gas	$53.73	October	2012
16	Gas	Gas	$47.22	October	2012

Finally, the most robust part of this group is the credit card transaction download. This button takes login information, logs in to the bank account, and downloads the most recent credit card

transactions (although the current program specifically searches for the second credit card in the list).
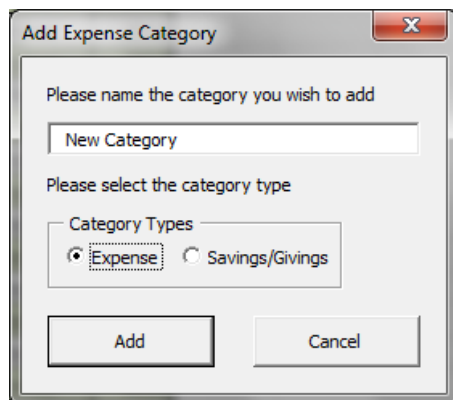

After downloading them, the program shows each expense, one at a time with a user form, and allows the user to make changes, accept the expense, or cancel it and prevent it from posting to the budget. Some of the images in the process are displayed below.

Categories

The categories group was a key part of making this software as robust as possible. A preset list of categories can only get a user so far. The ability to add and remove categories is a great tool to increasing the flexibility of a budget. The first button, that adds categories, references a hidden spreadsheet where the list of categories is kept.

The new category is added to that list, so that it will show up on all the user forms. A line for the category is then added to the detailed budget. Depending on whether the category is a normal expense or a savings/givings item, the category will be entered alphabetically into the related section of the budget, as shown below.

	A	B	C	D	E	
1	Income and Expenses	October 2012 Budget	October 2012 Actual	Variance	November 2012 Budget	Novembe
19	Clothing/Hair	$15.00	$15.00	$0.00		
20	Eating Out	$20.00	$18.35	$1.65	$20.00	
21	Fun	$120.00	$140.47	($20.47)	$50.00	
22	Gas	$140.00	$149.87	($9.87)	$240.00	
23	Groceries	$240.00	$241.89	($1.89)	$100.00	
24	Gym	$75.00	$0.00	$75.00		
25	Insurance/Car	$30.00	$27.85	$2.15		
26	Medical/Health	$10.00	$4.00	$6.00		
27	Misc	$400.00	$476.09	($76.09)		
28	New Category		$0.00	$0.00		
29	Rent	$605.00	$611.00	($6.00)	$605.00	
30	Renter's Insurance	$20.00	$0.00	$20.00		
31	School	$20.00	$35.45	($15.45)		
32	Travel	$600.00	$602.40	($2.40)	$20.00	
33	Utilities/Laundry/Rentals	$20.00	$25.00	($5.00)		
34	Total Expenses	$2,315.00	$2,347.37	($32.37)	$1,035.00	
35						
36	Net Remaining	($1,505.00)	($1,307.50)	$197.50	($60.00)	

An important part of this program can be seen by the formula in the active cell. This formula references all expenses from the expense list that are "New Category" expenses from October of 2012. This formula, along with the other formulas in the row, had to be added automatically when the new row was inserted.

The remove category option is simple. The user selects the category they want to delete, and also selects the category for which those expenses should now be categorized.

Once the user selects "Remove" a confirmation window appears asking if they are sure (since they are deleting data). If they select "Yes," the program deletes the category from the master list, removes the category row from the detailed budget, and recategorizes the expenses on the expense list to the new category (in this case, "Misc").
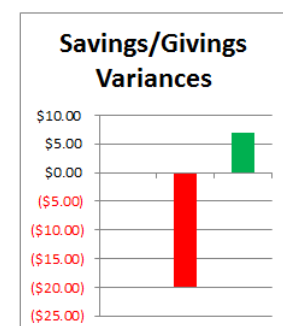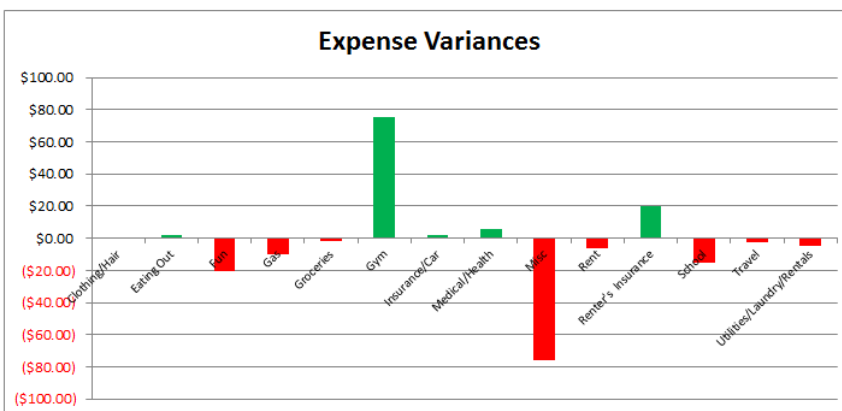
Adjust Month

The whole point to creating a budget is to analyze your income and expenditures and see where changes should be made. The two places that this occurs are on the "Detailed Budget" tab and the "Variance Analysis" tab. The "Detailed Budget" shows a summary of the budget, actual results, and variance for each expense item in the budget for each month as shown below.

	A	B	C	D	E	F	G
1	Income and Expenses	October 2012 Budget	October 2012 Actual	Variance	November 2012 Budget	November 2012 Actual	Variance
11	Fast Offerings	$20.00	$20.00	$0.00	$30.00	$20.00	($10.00)
12	Savings	$20.00	$0.00	($20.00)	$30.00	$0.00	($30.00)
13	Tithing	$450.00	$457.00	$7.00	$40.00	$50.00	$10.00
14	Total Saving/Giving	$490.00	$477.00	($13.00)	$100.00	$70.00	($30.00)
15							
16	Net after Giving	$810.00	$1,039.87	$229.87	$975.00	$1,050.00	$75.00
17							
18	EXPENSES						
19	Clothing/Hair	$15.00	$15.00	$0.00		$0.00	$0.00
20	Eating Out	$20.00	$18.35	$1.65	$20.00	$15.76	$4.24
21	Fun	$120.00	$140.47	($20.47)	$50.00	$0.00	$50.00
22	Gas	$140.00	$149.87	($9.87)	$240.00	$246.12	($6.12)
23	Groceries	$240.00	$241.89	($1.89)	$100.00	$57.69	$42.31
24	Gym	$75.00	$0.00	$75.00		$0.00	$0.00
25	Insurance/Car	$30.00	$27.85	$2.15		$0.00	$0.00
26	Medical/Health	$10.00	$4.00	$6.00		$0.00	$0.00
27	Misc	$400.00	$476.09	($76.09)		$0.00	$0.00
28	Rent	$605.00	$611.00	($6.00)	$605.00	$567.27	$37.73
29	Renter's Insurance	$20.00	$0.00	$20.00		$0.00	$0.00
30	School	$20.00	$35.45	($15.45)		$0.00	$0.00
31	Travel	$600.00	$602.40	($2.40)	$20.00	$38.00	($18.00)
32	Utilities/Laundry/Rentals	$20.00	$25.00	($5.00)		$0.00	$0.00
33	Total Expenses	$2,315.00	$2,347.37	($32.37)	$1,035.00	$924.84	$110.16
34							
35	Net Remaining	($1,505.00)	($1,307.50)	$197.50	($60.00)	$125.16	$185.16

Looking at the variances, you will notice that the formula for the Saving/Giving section is the opposite of the expense variance formula. This is because the assumption is made that for those categories, the user wants to make sure that they save and give AT LEAST that much. A negative variance for these categories is not setting enough money aside, whereas the normal expenses are the opposite.

The other analysis tool is on the "Variance Analysis" tab. This includes two graphs that show these same sections of variances, but in graph form. This gives the user a visual look at the variances for the month.
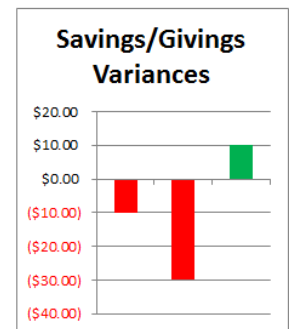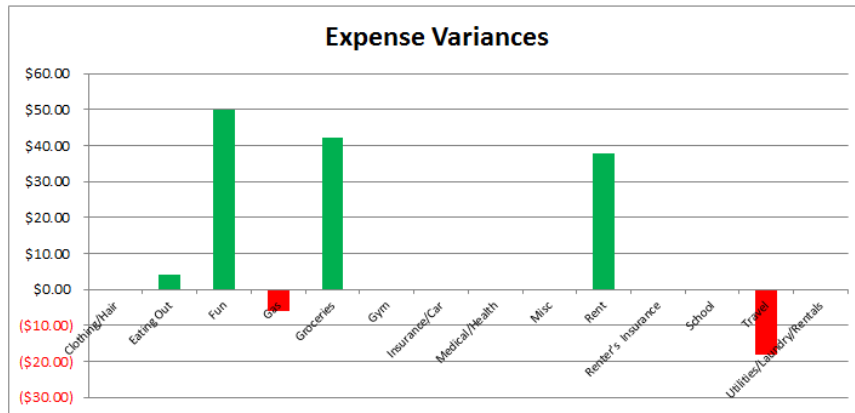

However, it only shows the current month. That's where the "Adjust Month" buttons come in. These buttons change the data series for the tables to the next or previous month (depending

on which button the user selects). This allows the user to move from month to month and see the changes in variances for each period.

These buttons also hide the previous month's columns in the "Detailed Budget" tab to make viewing the current month easier (notice that the left-most section is now November).

	A	E	F	G	H	I	J
1	Income and Expenses	November 2012 Budget	November 2012 Actual	Variance	December 2012 Budget	December 2012 Actual	Variance
11	Fast Offerings	$30.00	$20.00	($10.00)		$0.00	$0.00
12	Savings	$30.00	$0.00	($30.00)		$0.00	$0.00
13	Tithing	$40.00	$50.00	$10.00		$0.00	$0.00
14	**Total Saving/Giving**	**$100.00**	**$70.00**	**($30.00)**	**$0.00**	**$0.00**	**$0.00**
15							
16	**Net after Giving**	**$975.00**	**$1,050.00**	**$75.00**	**$0.00**	**$0.00**	**$0.00**
17							
18	**EXPENSES**						
19	Clothing/Hair		$0.00	$0.00		$0.00	$0.00
20	Eating Out	$20.00	$15.76	$4.24		$0.00	$0.00
21	Fun	$50.00	$0.00	$50.00		$0.00	$0.00
22	Gas	$240.00	$246.12	($6.12)		$0.00	$0.00
23	Groceries	$100.00	$57.69	$42.31		$0.00	$0.00
24	Gym		$0.00	$0.00		$0.00	$0.00
25	Insurance/Car		$0.00	$0.00		$0.00	$0.00
26	Medical/Health		$0.00	$0.00		$0.00	$0.00
27	Misc		$0.00	$0.00		$36.40	($36.40)
28	Rent	$605.00	$567.27	$37.73		$0.00	$0.00
29	Renter's Insurance		$0.00	$0.00		$0.00	$0.00
30	School		$0.00	$0.00		$0.00	$0.00
31	Travel	$20.00	$38.00	($18.00)		$0.00	$0.00
32	Utilities/Laundry/Rentals		$0.00	$0.00		$0.00	$0.00
33	**Total Expenses**	**$1,035.00**	**$924.84**	**$110.16**	**$0.00**	**$36.40**	**($36.40)**
34							
35	**Net Remaining**	**($60.00)**	**$125.16**	**$185.16**	**$0.00**	**($36.40)**	**($36.40)**

All of these tools that we have discussed are a powerful set of tools that allow users to begin basic budgeting and start on the path towards financial security.

Discussion of Learning and Conceptual Difficulties Encountered

This project was a great learning experience. I made the decision to challenge myself and I was rewarded with each breakthrough. Some of the main challenges that I encountered were:

- Trying to determine what I personally would want and need in a budgeting program was a great challenge. As the semester progressed, the scope of my project kept increasing because I wanted to keep adding features to make it better.
- Learning to use the "agent" class module to download credit card transactions from the Wells Fargo website.
    - This was especially difficult because the link to the credit card page includes a string of around 30 random characters that changes every time the user logs in. This required searching the source code for the location of the link and then extracting the random string of characters.
    - After downloading the transactions, importing each transaction into the manual expense entry form to allow the user to adjust and approve each transaction before posting to the expense list.
- Insert formulas into cells using VBA.
    - Each formula contained variables dependent on where the formula was inserted and each variable also needed to be surrounded by quotation marks for the formula to work.
- Using VBA to change the series data for a chart based on relative location of new data to the current chart data.
- Create a ribbon for convenient access to program features.
- Handling errors and using error checking to avoid invalid user inputs.
    - A significant amount of time was spent attempting to think of data that users could input incorrectly and ways to prevent and notify the user of those errors.
- This project was user form intensive and required a lot of studying to learn the different ways I could use and interact with user forms.
- Using a "For Each" Loop to determine where shifting data is located.
    - "For Each" loops themselves are simple enough, but using them to determine where data is located and then using that data required a lot of creativity. Some examples include looking for the first occurrence of a phrase or the first occurrence of a "visible" column.
- Countless additional methods, properties, and objects that expanded my library of VBA knowledge.

Assistance

Assistance was requested from the teacher on one occasion to determine the best way to change a charts source data using VBA. This was the extent of outside assistance (aside from Google and Help) and all code was written by myself.