

# **Family Finance Application**

**MBA 614 - Final Project**

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## **Executive Summary**

Family Finance Application (FFA) is a VBA automated spreadsheet that allows the user to keep track of everyday financial transactions along with ability to set the monthly budget and retrieve a monthly budget vs. actual report. The application provides a user form interface for every function of the application. FFA uses double-entry accounting and requires manual entry of every transaction, which indirectly forces the user to be mindful of his/her spending, keeping expenses low. Additionally, the application contains a custom ribbon tab with various function buttons, which makes the application more user-friendly.

Prior to this project our family used a less-sophisticated spreadsheet to keep track of our finances. This application allows us to further automate the budgeting process and add more structure to managing our money. FFA has been a great time-saver so far for my family.

## **Introduction**

Prior to this project our family used a less-sophisticated spreadsheet to keep track of our finances. This application allows us to further automate the budgeting process and add more structure to managing our money. Family Finance Application (FFA) is a VBA automated spreadsheet that allows the user to keep track of everyday financial transactions along with the ability to set the monthly budget and retrieve a monthly budget vs. actual report. This documentation will explain the basic functionality and features of the FFA.

For demonstration purposes I have entered in 79 actual transactions along with budgets for the months of October and November.

## **Application Structure**

FFA consists of 5 worksheet tabs: Main Page, General Ledger, Budget Data, Monthly Report, and Account Data & Lists. In using FFA the user only sees the Main Page tab the majority of the time, with the code being executed in the background with the rest of the tabs.

### ***Main Page Tab***

This tab has been formatted to act as a background screen for the application. The tab contains the application title, developer's name, and instructions on how to get started.



## General Ledger Tab

This tab acts as a traditional accounting general ledger to store all transactions. The user will not use this tab to manually input the information, rather a user form input is used to store the data on this tab. Further, the information from this tab is used to summarize the actual income/expense amounts on a monthly basis. The following is a list of data stored on this tab:

- Main Transaction Information
  - Transaction ID
  - Transaction Date
  - Transaction Type (Expense, Income, Liability, or Account Transfer)
  - Debit Account Number
  - Debit Account Name
  - Credit Account Number
  - Credit Account Name
  - Transaction Amount (*Note: At this point FFA is only designed use a two-line journal entry, therefore the debit and credit amount will always equal*)
  - Transaction Comments
- Information Specific to an Expense Transaction
  - Expense Location/Place – indicate where the transaction occurred or who the item was purchased from, this is normally the business name from the expense receipt
  - Item Purchased
- Information Specific to an Income Transaction
  - Income Source – this is the field that indicates the income source or user's employer

The following screenshot demonstrates what the General Ledger tab looks like:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<b>General Ledger</b>													
2	<b>Main Information</b>										<b>Expense Information</b>			
3	<b>Transaction ID</b>	<b>Transaction Date</b>	<b>Transaction Type</b>	<b>Debit Account Number</b>	<b>Debit Account</b>	<b>Credit Account Number</b>	<b>Credit Account</b>	<b>Amount</b>	<b>Comments</b>	<b>User</b>	<b>Exp. Location/Place</b>	<b>Item Purchased</b>	<b>Income Source</b>	
4	1	10/19/2010	Income	A-003	Money Marli-005	Monique's	\$370.33						EdgeMont - Receipt	
5	2	10/19/2010	Income	A-003	Money Marli-005	Monique's	\$587.83						Heritage School - Y	
6	3	10/19/2010	Expense	E-002	Church Fast L-001	Church Fast	\$5.00				BYU 169th Ward	N/A		
7	4	10/19/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$37.00		EdgeMont		BYU 169th Ward	N/A		
8	5	10/19/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$59.00		Heritage School		BYU 169th Ward	N/A		
9	6	10/19/2010	Expense	E-014	Internet Exp A-004	Primary Che	\$8.32		Paid with a Cashie	Justin Jensen	N/A			
10	7	10/21/2010	Income	A-004	Primary Che I-004	Dimitriy's P	\$240.24						Brigham Young Uni	
11	8	10/21/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$24.00		BYU - RA		BYU 169th Ward	N/A		
12	9	10/28/2010	Expense	E-006	Entertainm L-003	Wells Fargo	\$6.23				Zurchers	Masacade Mask		
13	10	10/25/2010	Expense	E-009	Groceries E A-004	Primary Che	\$21.18				Smith's	N/A		
14	11	10/25/2010	Expense	E-009	Groceries E A-004	Primary Che	\$2.05				Smith's	N/A		
15	12	10/25/2010	Expense	E-029	Tuition Expi A-004	Primary Che	\$15.00				BYU	Undergraduate Graduation Fee		
16	13	10/31/2010	Expense	E-022	Phone Expe L-003	Wells Fargo	\$83.58		Confirmation Num	T-Mobile		October Fee		
17	14	11/1/2010	Income	A-003	Money Marli-005	Monique's	\$276.52						Heritage School - Y	
18	15	11/1/2010	Income	A-003	Money Marli-005	Monique's	\$294.49						EdgeMont - Receipt	
19	16	11/1/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$28.00				BYU 169th Ward	N/A	Heritage School - Y	
20	17	11/1/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$30.00		EdgeMont		BYU 169th Ward	N/A		
21	18	11/1/2010	Expense	E-002	Church Fast L-001	Church Fast	\$10.00				BYU 169th Ward	N/A		
22	19	11/2/2010	Income	A-001	Cash Accou L-003	Other Incon	\$5.00		Found Cash				N/A	
23	20	11/2/2010	Expense	E-007	Gasoline/P L-003	Wells Fargo	\$41.54				Gas N Go	N/A		
24	21	11/2/2010	Expense	E-012	Hygeine Pro A-002	Gift Card/St	\$17.10		Bath & Body Works		Bath & Body Wor	Skin Lotion		
25	22	11/1/2010	Expense	E-012	Hygeine Pro A-002	Gift Card/St	\$9.32		Target Giftcard		Target	Tooth Paste		
26	23	11/1/2010	Expense	E-011	Home Item A-002	Gift Card/St	\$13.32		Target Giftcard		Target	Ziplocks, Paper towels		
27	24	11/1/2010	Expense	E-009	Groceries E A-004	Primary Che	\$94.51				WinCo	N/A		
28	25	11/1/2010	Expense	E-003	Church Tithi L-002	Church Tithi	\$635.00		Paid with a Cashie	Heritage School	N/A			

## Budget Data Tab

This is the tab where the data from the monthly budget assignment gets stored. As with other background tabs, the user does not interact directly with this worksheet, rather the data is saved automatically through the use of a user form. Further, the information from this tab is used to generate the budget vs. actual monthly report. The following is a list of data stored on this tab:

- **Year**
- **Month**
- **Income Accounts**
  - There are 8 different income accounts (*for a complete list see the FFA*)
  - Naming convention – I-XXX (*example: Interest Income, I-002*)
- **Total Income Amount** - sum of all Income Accounts
- **Expense Accounts**
  - There are 34 different expense accounts (*for a complete list see the FFA*)
  - Naming convention – E-XXX (*example: Groceries Expense, E-009*)
- **Total Expense Amount** – sum of all Expense Accounts
- **Total Budgeted Monthly Savings** (Total Income Amount-Total Expense Amount)

The following screenshot shows the layout of the Budget Data tab:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Budget Data																	
2			Income Accounts									Expense Accounts						
3			I-001	I-002	I-003	I-004	I-005	I-006	I-007	I-008	Total Inc	E-001	E-002	E-003	E-004	E-005	E-006	E-007
4	Year	Month	Gift Inco	Interest In	Other Inco	Dimitriy's	Monique's	Financial	Scholashi	Reimbursement Inco	Book Purc	Church Fa	Church Tit	Clothing/	Computer	Entertain	Gasoline	
5	2010	October	\$0.00	\$3.50	\$1,122.03	\$430.00	\$1,250.00	\$0.00	\$0.00	\$0.00	\$2,805.53	\$0.00	\$10.00	\$168.00	\$0.00	\$0.00	\$40.00	\$120.00
6	2010	November	\$0.00	\$4.50	\$0.00	\$53.00	\$1,100.00	\$0.00	\$0.00	\$0.00	\$1,157.50	\$0.00	\$10.00	\$115.30	\$10.00	\$0.00	\$40.00	\$90.00
7	2010	December	\$300.00	\$3.00	\$0.00	\$0.00	\$1,000.00	\$0.00	\$0.00	\$0.00	\$1,303.00	\$0.00	\$10.00	\$100.00	\$20.00	\$0.00	\$40.00	\$90.00

## Monthly Report Tab

This tab is used for presentational purposes. The tab is displayed when the user runs a budgeted vs. actual monthly report. The tab displays the selected year and month, Income/Expense account name and number, budgeted and actual monthly amounts, total cash inflow/outflow, budgeted and actual monthly savings, and percentage of the budget goal that was reached. In columns F and G of the tab percentage formulas and conditional formatting has been used to let the user know how he/she did for the selected month. The table below provides the legend for the conditional formatting symbol in the report:

✓	~actual income amount exceeded the budget or actual expense amount was below the budget
!	~actual amount equaled the budget
✗	~actual income amount was below the budget or actual expense amount was above the budget

The tab also contains a “Return to the Report Generator” macro button that allows the user to erase the current report data and return to the report generator user form to run a new query. The following screenshot shows the layout of the Budget Data tab:

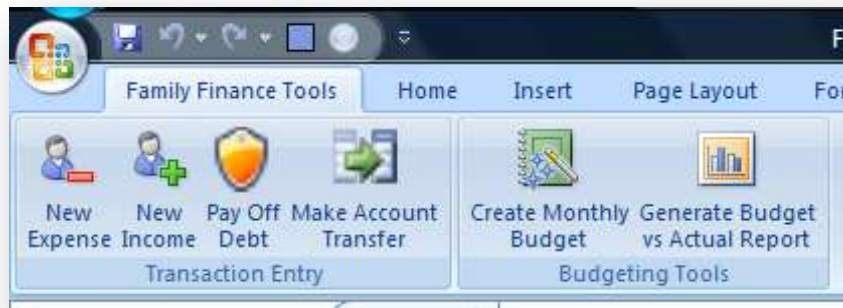
Monthly Budget vs. Actual Report				
Year: 2010		Return to the Report Generator		
Month: November				
Account Description	Account Number	Budgeted Amount	Actual Amount	Percent Reached
Gift Income	I-001	\$ -	\$ 344.51	✓
Interest Income	I-002	\$ 4.50	\$ 3.43	✗ 76.2%
Other Income	I-003	\$ -	\$ 5.00	✓
Dimitriy's Payroll Income	I-004	\$ 53.00	\$ 52.80	✗ 99.6%
Monique's Payroll Income	I-005	\$ 1,100.00	\$ 1,093.64	✗ 99.4%
Financial Aid Income	I-006	\$ -	\$ -	⚠
Scholarship Income	I-007	\$ -	\$ -	⚠
Reimbursement Income	I-008	\$ -	\$ -	⚠
<b>Total Cash Inflow</b>		<b>\$ 1,157.50</b>	<b>\$ 1,499.38</b>	✓ 129.5%
Book Purchases Expense	E-001	\$ -	\$ -	⚠
Church Fast Offerings Expense	E-002	\$ 10.00	\$ 10.00	⚠ 100.0%
Church Tithing Expense	E-003	\$ 115.30	\$ 117.00	✗ 101.5%
Clothing/Footwear Expense	E-004	\$ 10.00	\$ 80.35	✗ 803.5%
Computer/Electronics Expense	E-005	\$ -	\$ -	⚠
Entertainment Expense	E-006	\$ 40.00	\$ 9.89	✓ 24.7%
Gasoline/Public Transportation Expense	E-007	\$ 90.00	\$ 80.87	✓ 89.9%
Gift Expense	E-008	\$ 60.00	\$ 39.93	✓ 66.6%
Groceries Expense	E-009	\$ 180.00	\$ 147.56	✓ 82.0%
Haircut Expense	E-010	\$ -	\$ -	⚠
Home Items Expense	E-011	\$ 12.00	\$ 83.99	✗ 699.9%
Hygiene Products/Toiletries Expense	E-012	\$ 30.00	\$ 37.82	✗ 126.1%
Interest Expense	E-013	\$ -	\$ 1.00	✗
Internet Expense	E-014	\$ 6.25	\$ -	✓ 0.0%

### Account Data & Lists

This is basically a maintenance tab that contains the data needed to make the user forms function. Primarily the tab contains lists of accounts (expense, income, asset, liability) that are used to populate the combo boxes and other lists in the user forms.

### Custom Ribbon Tab

In order to make FFA more user-friendly I have used the Custom UI Editor for Microsoft Office to alter the ribbon specific to the FFA Excel File. A “Family Finance Tools” tab was added on the ribbon in front of the “Home” tab. This new tab contains custom buttons for all user forms, which will be discussed later in this document. The following screenshot illustrates the customized ribbon:



The “Family Finance Tools” tab consists of two individual sections: Transaction Entry and Budgeting Tools. Functionality of each is described in further detail below.

## **Transaction Entry**

In evaluating our family’s financial activity, I have identified 4 types of possible transactions: new expense, new income, paying off debt, and making an account transfer. Each one of these activities is reflected in the General Ledger of FFA. Each transaction is entered into FFA using a specific user form described below.

### ***New Expense Transaction Form***

The screenshot below is a user form for entering a new expense transaction:

The form contains the following data entry fields:

- **Transaction Date** – VBA code protects FFA from an invalid date entry, by displaying a warning message, if the format is not entered correctly. Additionally the code can recognize the date if the user inputs just “12/3” or types in “dec 3”. The form will automatically format the field to “12/3/2010”
- **Transaction ID** – this field is generated automatically based on the next available transaction ID. The code is

Report Expense Transaction		
Enter Transaction Date:	12/3/2010	Transaction ID: 93
<b>Expense</b>		
Debit Account		
Select the Account to Debit:	Amount	
Computer/Electronics Expense	\$35.43	
Credit Account		
Select the Account to Credit:	Amount	
Primary Checking Account-2162	\$35.43	
Enter Exp. Location/Place:	BestBuy	Enter the Item Purchased: Headphones
Enter Comments:		
Sony headphones. Can be returned upto 30 days		
Proposed Journal Entry		
Account Name	Debit	Credit
Computer/Electronics Expense	\$35.43	
Primary Checking Account-2162		\$35.43
Submit & New Submit & Close Calculator Clear All Cancel		



able to look up the last transaction ID used on the General Ledger tab and then populate the next number into the user form.

- **Debit Account Name** – this is a combo box dropdown that receives its Row Source from a list located on the Account Data & Lists tab. Only valid expense accounts will show up in this drop down.
- **Debit Amount** – VBA code protects FFA from an invalid amount entry, by displaying a warning message, if the format is something other than numeric. Further, after this field is updated, the code automatically formats this field as currency.
- **Credit Account Name** – similar functionality as the Debit Account Name. The dropdown allows the user to select from asset and liability accounts to pay for the new expense.
- **Credit Amount** – this textbox is disabled and is automatically populated based on the value in the Debit Amount field. For an individual transaction FFA requires that the journal entry is limited to only two lines and that debit equal credit amount.
- **Expense Location/Place** – manual entry
- **Item Purchased** – manual entry
- **Comments** – manual entry
- **Proposed Journal Entry** – this section consists of object labels that are populated automatically after the Credit Account Name is selected. This section allows the user to review the proposed journal entry prior to saving it to the General Ledger tab.

The New Expense form contains the following buttons:

- **Submit & New** – saves the proposed transaction to the General Ledger tab and opens up a brand new Expense form with the next available Transaction ID.
- **Submit & Close** - saves the proposed transaction to the General Ledger tab and closes the form.
- **Calculator** – opens up Windows Calculator that allows the user to perform simple calculations without exiting the entry form.
- **Clear All** – clears all fields.
- **Cancel** – exits the form without saving.



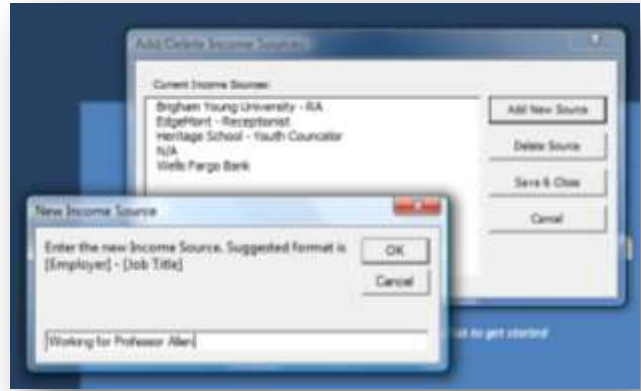
*The rest of the Transaction Entry forms have very similar functionality and features as the New Expense Transaction form, with several exceptions based on their underlying nature and purpose. These subtle differences will be described in their respective sections below.*

### **New Income Transaction Form**

This is a form that is used to report any cash inflow (new paycheck, gift cash, or interest income). The following are the additional feature of the form:



- **Source of Income Dropdown** – this field allows the user to indicate where the income is coming from. The field is a combo box with limited preset entry options.
- **“Add/Delete Source” Button** – this button brings up another form that allows the user to delete existing income sources or add new ones. The form contains a list box that displays all current sources. When a user wants to add a new source a simple input box appears. Once the new source has been entered it appears in the list box of the main form. Only when the user clicks the “Save & Close” button is the income source list actually updated in the background database. Once the user is back to the New Income Transaction form he/she will be able to see the changes that were made in the Source of Income dropdown.



The following screenshot displays the New Income Transaction form:

**Report Income Transaction**

Enter Transaction Date: 11/30/2010      Transaction ID: 93

***Income***

---

**Debit Account**

Select the Account to Debit: Money Market Account-2162      Amount: \$300.00

---

**Credit Account**

Select the Account to Credit: Dimitriy's Payroll Income      Amount: \$300.00

---

Select the Source of Income: Brigham Young University - RA      Add/Delete Source

---

Enter Comments: Research Project

---

**Proposed Journal Entry**

Account Name	Debit	Credit
Money Market Account-2162	\$300.00	
Dimitriy's Payroll Income		\$300.00

---

Submit & New      Submit & Close      Calculator      Clear All      Cancel

### ***Pay Off Debt Transaction Form***

This is a form that would be used whenever a liability is being paid down. For example, if the user wanted to pay off a credit card debt, he/she would enter in a transaction in this form by debiting a credit card account and crediting an asset account, such a checking account. The rest of the form has a very similar functionality as the rest of the form described above.

### ***Account Transfer Transaction Form***

This is a form that allows the user to make a transfer between asset accounts (such as transferring money from one checking account to another). Such functionality will be especially useful later on, once FFA is further developed and is able to not only keep track of income and expenses, but also track the running balances in each asset and liability account. The following screenshot illustrates what this form looks like:

The screenshot shows a window titled "Pay Off Debt/Liability" with a close button (X) in the top right corner. The window contains the following fields and sections:

- Enter Transaction Date:** 11/29/2010
- Transaction ID:** 93
- Liability** (text in the top right corner)
- Debit Account:**
  - Select the Account to Debit: Wells Fargo Credit Card Account-4475
  - Amount: \$87.56
- Credit Account:**
  - Select the Account to Credit: Primary Checking Account-2162
  - Amount: \$87.56
- Enter Comments:** Paid Online - Confirmation Number : JRT3452
- Proposed Journal Entry:**

Account Name	Debit	Credit
Wells Fargo Credit Card Account-4475	\$87.56	
Primary Checking Account-2162		\$87.56
- Buttons:** Submit & New, Submit & Close, Calculator, Clear All, Cancel

The screenshot shows a window titled "Account Transfer" with a close button (X) in the top right corner. The window contains the following fields and sections:

- Enter Transaction Date:** 11/25/2010
- Transaction ID:** 93
- Account Transfer** (text in the top right corner)
- Transfer TO Account:** Secondary Checking Account-6054
- Transfer FROM Account:** Primary Checking Account-2162
- Amount to Transfer:** \$200.00
- Enter Comments:** Online Transfer
- Proposed Journal Entry:**

Account Name	Debit	Credit
Secondary Checking Account-6054	\$200.00	
Primary Checking Account-2162		\$200.00
- Buttons:** Submit & New, Submit & Close, Calculator, Clear All, Cancel

## **Budgeting Tools**

This is an important part of the application that allows the user to set a monthly budget and review on a monthly basis how the actual income/expenses compare to the budgeted figures. Prior to creating FFA my spouse and I would use a spreadsheet that attempted to provide a similar functionality but was slow and error-prone due to the lengthy manual data entry process and sheets that were loaded with complex formulas. Using VBA code instead of cell formula has sped up the process significantly, while containing the overall file size within a reason. The following section will describe the two features that are currently available in FFA: creating a monthly budget and generating a budget vs. actual report.

### ***Creating a Monthly Budget***

FFA is able to provide a user with a smooth and error-proof process of entering a monthly budget through a use of a multi-tab user form. The form contains three separate tabs: Income Accounts and two tabs for Expense Accounts. For convenience another column is displayed in the form to show what the actual amounts were in the previous month. The screenshot to the right demonstrates these features:

The form contains the following data entry fields and information labels:

- **Select Month Dropdown** – this is a combo box field that allows the user to select the desired budget month. The application automatically assumes current year. Once the month is selected the application checks to see if a budget already exists for this month. If the budget already exists the user receives a warning message of notification and is asked to select another month. If the

**Assign a Monthly Budget**

Select Month: December

***December 2010 Budget***

Income | Expenses (Part 1) | Expenses (Part 2)

Account Name	Account Number	December Budget	November Actuals
Book Purchases Expense	E-001	\$0.00	\$0.00
Church Fast Offerings Expense	E-002	\$10.00	\$10.00
Church Tithing Expense	E-003	\$140.00	\$117.00
Clothing/Footwear Expense	E-004	\$40.00	\$80.35
Computer/Electronics Expense	E-005	\$20.00	\$0.00
Entertainment Expense	E-006	\$40.00	\$9.89
Gasoline/Public Transportation	E-007	\$90.00	\$80.87
Gift Expense	E-008	\$120.00	\$39.93
Groceries Expense	E-009	\$180.00	\$147.56
Haircut Expense	E-010	\$0.00	\$0.00
Home Items Expense	E-011	\$0.00	\$83.99
Hygiene Products/Toiletries Expense	E-012	\$10.00	\$37.82
Interest Expense	E-013	\$0.00	\$1.00
Internet Expense	E-014	\$8.33	\$0.00
Laundry Expense	E-015	\$10.00	\$0.00
Medical Care Expense	E-016	\$0.00	\$0.00
Medical Insurance Expense	E-017	\$0.00	\$0.00

	December Budget	November Actuals
Total Budgeted Income (Cash Inflow):	\$2,509.00	\$1,499.38
Total Budgeted Expenses (Cash Outflow):	\$668.33	\$1,512.86
Total Projected December Savings:	\$1,840.67	(\$13.48)

Note: In order to adjust the total amounts above, please refer back to the Income and Expense tabs of this form.

Save & Close | Clear All | Calculator | Cancel

selected month is not found, then the form is automatically populated with a large label in the upper right corner (ex: "December 2010 Budget") , the column headings for budget and actual amounts are populated with the selected and previous month names, and actual of the previous month are summed by category and displayed in the prior month column.

- **Income Tab** – this tab contains all 8 income accounts
- **Expenses (Part 1) Tab** – this tab contains the first 17 expense accounts
- **Expenses (Part 2) Tab** – this tab contains the remaining 17 expense accounts (*Note: the expense accounts were split into two tabs in order to keep the form reasonable in size*)
- **Summary Budget (Running Totals)** – this section is contained below the multi-tab section of the form and contains the following fields
  - **Total Budgeted Income** – this field is updated automatically based on the inputs in the Income Tab described above. The amount is recalculated every time one of the income accounts is changed.
  - **Total Budgeted Expenses** – this field is updated automatically based on the inputs in the Expenses Tabs above. The amount is recalculated every time one of the expense accounts is changed.
  - **Total Projected Savings** – this field dynamically calculates the difference between the Total Budgeted Income and Total Budgeted Expenses. The field is recalculated automatically whenever any of the fields in the multi-tab section of the form is changed. This feature lets the user know what the projected savings will be before he/she is done with setting the budget for every account. Additionally, the user is able to tweak the budgeted numbers until he/she has reached the desired monthly savings amount.

The Monthly Budget form contains the following buttons:

- **Save & Close** – saves the budget to the Budget Data worksheet and closes the form.
- **Clear All** – allows the user to clear all entered data and start over with the budget process. When this button is clicked a message box appears asking the user to confirm that he/she really wants to erase all information.
- **Calculator** - opens up Windows Calculator that allows the user to perform simple calculations without exiting the entry form.
- **Cancel** – exits the form. When this button is clicked a message box appears asking the user to confirm that he/she really wants to exit the form without saving the entered data.

### ***Generating a Budget vs Actual Report***

This FFA functionality allows the user to run a report to see how the actual income/expense transactions compare to the assigned budget amounts. This is perhaps one of the most useful features for our family, as it allows us to control our spending and anticipate substantial future expenses. When the corresponding button is clicked on the custom ribbon tab the following form appears:



The screenshot shows a small dialog box titled "Generate a Monthly Budget vs. Actual Rep...". Inside the dialog, there are two dropdown menus. The first is labeled "Select Year:" and has "2010" selected. The second is labeled "Select Month:" and has "November" selected. At the bottom of the dialog, there are two buttons: "Show Report" and "Cancel".

From this form the user is able to specify the time period of the report by selecting year and month from the two combo boxes. When the selection is made and “Show Report” button is clicked, FFA checks against the “Budget Data” worksheet, whether the selected budget exists in the database. If the requested budget is not found, the user is notified with a message box and is asked to select another time period. “Cancel” button simply exits the form.

Once a valid time period is selected, the user is taken to the “Monthly Report” worksheet, where the requested report is presented.

	A	B	C	D	E	F	G
1							
2		Monthly Budget vs. Actual Report					
3							
4		Year: 2010				Return to the Report Generator	
5		Month: November					
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

Account Description	Account Number	Budgeted Amount	Actual Amount	Percent Reached
Gift Income	I-001	\$ -	\$ 344.51	✓
Interest Income	I-002	\$ 4.50	\$ 3.43	76.2%
Other Income	I-003	\$ -	\$ 5.00	✓
Dimitriy's Payroll Income	I-004	\$ 53.00	\$ 52.80	99.6%
Monique's Payroll Income	I-005	\$ 1,100.00	\$ 1,093.64	99.4%
Financial Aid Income	I-006	\$ -	\$ -	0%
Scholarship Income	I-007	\$ -	\$ -	0%
Reimbursement Income	I-008	\$ -	\$ -	0%
<b>Total Cash Inflow</b>		<b>\$ 1,157.50</b>	<b>\$ 1,499.38</b>	<b>129.5%</b>
Book Purchases Expense	E-001	\$ -	\$ -	0%
Church Fast Offerings Expense	E-002	\$ 10.00	\$ 10.00	100.0%
Church Tithing Expense	E-003	\$ 115.30	\$ 117.00	101.5%
Clothing/Footwear Expense	E-004	\$ 10.00	\$ 80.35	803.5%
Computer/Electronics Expense	E-005	\$ -	\$ -	0%
Entertainment Expense	E-006	\$ 40.00	\$ 9.89	24.7%
Gasoline/Public Transportation Expense	E-007	\$ 90.00	\$ 80.87	89.9%
Gift Expense	E-008	\$ 60.00	\$ 39.93	66.6%
Groceries Expense	E-009	\$ 180.00	\$ 147.56	82.0%
Haircut Expense	E-010	\$ -	\$ -	0%
Home Items Expense	E-011	\$ 12.00	\$ 83.99	699.9%
Hygiene Products/Toiletries Expense	E-012	\$ 30.00	\$ 37.82	126.1%
Interest Expense	E-013	\$ -	\$ 1.00	0%
Internet Expense	E-014	\$ 6.25	\$ -	0.0%

Main Page General Ledger Budget Data **Monthly Report** Account Data & Lists

By using the “Return to the Report Generator” button the user is able to go back to the report generator form and select another time period to view. For additional explanation about the layout of this report please refer to the **Monthly Report Tab** section of this document.

## Learning and Conceptual Difficulties Encountered

This section lists several difficulties that were encountered in the process of making FFA functional.

- **Generating a unique Transaction ID** – There are four different types of transaction forms in FFA. The design of the database required that every time one of the forms was opened, a new unique Transaction ID must be generated and displayed in that form. In order to overcome this obstacle I wrote a separate Sub that generated the next available Transaction ID by looking at the last used Transaction ID in the General Ledger worksheet and adding 1 to it. Then I would simply call this Sub from within the Private Initialize Sub of each transaction form.
- **Transaction Date Error Check** – In order to prevent the user from making an invalid entry in the Transaction Date field or using an inconsistent date format, I had to write a code that would detect incorrect input characters and notify the user. Additionally I needed a procedure that would automatically standardize the input format, so that it could be later used in performing calculations and sorting the data by its date. I wrote the following code to solve this problem:

```
Private Sub txtTransactionDateExp_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)
'check to make sure that date is in the right format
    With txtTransactionDateExp
        If .Text = "" Then
        ElseIf IsDate(.Text) Then
            .Text = Format(.Text, "Short Date")
        Else
            MsgBox "Transaction Date format is incorrect. Standard format is mm/dd/yy."
            Cancel = True
            .SetFocus
            .SelStart = 0
            .SelLength = Len(.Text)
        End If
    End With
End Sub
```

The code is initiated before the Transaction Date field is fully updated. The Sub uses the “IsDate” function to check if the input is an actual date. If it is, then it is formatted as a “short date”. If it is not a valid date then the user is notified that the format is invalid and the cursor returns back to the Transaction Date field.

- **Budget Form Dynamic Totals** – The monthly budget form allows the user to input individual income/expense amounts into the form and be able to see in real time how this would affect the total income or expense amounts and more importantly, the projected savings amount. Building this feature required an extended amount of VBA code because there needed to be a Private After Update Sub for each account field. I was able to write a separate Sub that recalculated the total fields and would then call this Sub for each individual account field. The following excerpt from the code illustrates the basic logic of this procedure:



```

Sub CalcSavings()
'update the total exp
'Change all expense amounts to standard numbers
txtTotalExpBudAmount.Text = Format(txtTotalExpBudAmount.Text, "General Number")
txtTotalIncBudAmount.Text = Format(txtTotalIncBudAmount.Text, "General Number")
txtTotalSavBudAmount.Text = Format(txtTotalSavBudAmount.Text, "General Number")
Dim i As Integer
For i = 1 To 8
    frmMonthlyBudget.Controls("txtIncBudAmount" & i).Text = Format(frmMonthlyBudget.Controls("txtIncBudAmount"
Next i
i = 0
For i = 1 To 34
    frmMonthlyBudget.Controls("txtExpBudAmount" & i).Text = Format(frmMonthlyBudget.Controls("txtExpBudAmount"
Next i
'Perform the Income calculation
txtTotalIncBudAmount.Value = Val(txtIncBudAmount1.Text) + Val(txtIncBudAmount2.Text) + Val(txtIncBudAmount3.Text)
+ Val(txtIncBudAmount4.Text) + Val(txtIncBudAmount5.Text) + Val(txtIncBudAmount6.Text) + Val(txtIncBudAmount7.Text)
+ Val(txtIncBudAmount8.Text)

```

To perform the actual calculations I used the VBA Val function. And in order to do that I had to convert all text fields involved in the calculation first to a “general number” format and then back to the “currency” format for the presentational purposes in the user form. In order to make conversion using less code, I used the For...Next loop as shown above.

- **Calculating Actual Amounts** – The Monthly Budget form and the Actual vs Budget report requires FFA to calculate the monthly totals for each account category. This would require obtaining and summarizing data from the “General Ledger” worksheet. In order to do that I wrote a procedure that would first select the whole date range in the “General Ledger” worksheet, then filter through the range by selecting only the dates that match the time period selected by the user (using the Select...Case...End Select method), and finally add the matching instances to the summary variables for each account. The following screenshot partially demonstrates the fundamentals of this approach:

```

'set the transaction data range
Set cell13 = Sheets("General Ledger").Cells(4, 1)
Set cell14 = cell13.End(xlDown).End(xlToRight)
Set reportTransDate = Range(cell13, cell14)
'find the actual income amounts
sumInc1 = 0
sumInc2 = 0
sumInc3 = 0
sumInc4 = 0
sumInc5 = 0
sumInc6 = 0
sumInc7 = 0
sumInc8 = 0
r = 0
For r = 1 To reportTransDate.CurrentRegion.Rows.Count
    If Month(reportTransDate.Cells(r, 2)) = Application.WorksheetFunction.VLookup(cbMonth, Range("MonthData"),
        Select Case reportTransDate(r, 6)
            Case Is = "I-001"
                sumInc1 = sumInc1 + reportTransDate.Cells(r, 8).Value
            Case Is = "I-002"
                sumInc2 = sumInc2 + reportTransDate.Cells(r, 8).Value
            Case Is = "I-003"
                sumInc3 = sumInc3 + reportTransDate.Cells(r, 8).Value
            Case Is = "I-004"

```



## **Conclusion**

FFA was developed in order to simplify and speed up the budgeting and expense tracking process for my family. It also allowed me to become further exposed to the VBA programming and refresh my memory on the basic concepts of double-entry accounting. I believe that this tool will allow my family to track expenditures with greater accuracy and in less time. In addition, this assignment has also allowed me to see some of the intricacies with database and financial systems that programmers often run into, which will be useful in my future career in accounting. I realize that currently FFA has only scratched the surface of what's possible with VBA Excel and I intend to continue to use the application and further develop its functionality.