College Student Tax Preparation

Chase Bradshaw and Travis Pearson

Executive Summary

The problem we sought to solve is creating an Excel based federal tax return preparation option for an average college student. Before setting out on this endeavor, we first defined what an average college student's needs for a tax return. Our determination is that an average college student files as either single or married, has zero to two children, has one to six W-2's, one to two 1098-T's, and zero to two 1099-Int's. Determining what inputs an average college student has in a tax return allowed us to refine which tax forms and calculations are needed. Our project consists of four user forms that capture the taxpayer's information and inputs it into a set of Excel based tax forms. Our project is equipped with both pages of the 1040, a schedule B, one copy of the first page of the 8863, two copies of the second page of the 8863 (in case the taxpayer is a college student and is also married to a college student), and a summary statement of income. The tax forms populate with information input by the taxpayer using the four user forms we created. The tax refund or tax due is calculated using hardcoded formulas and a tax calculation macro. Finally, a print preview of all of the taxpayer's forms launches for the taxpayer's final review before printing. It is important to note that although we feel like this would be a great idea to help estimate your tax liability/return; we strongly discourage anyone from actually filing their tax returns using this preparation tool.

Implementation and Documentation

The tax preparation solution we created consists of six steps. The six steps are (1) inputting personal information, (2) inputting W-2's, (3) inputting 1098-T's, (4) inputting the 1099-Int's, (5) calculating the tax, and (6) printing the return. We customized the ribbon of the file to include a "Tax Calc" tab (Exhibit 1) that includes a button for each of these steps.

Step 1: Inputting Personal Information

When the user clicks step 1 of the customized ribbon tab, a user form titled "Personal Information" launches (Exhibit 2). The purpose of this form is to capture information needed to complete the top half of page one of the 1040 and a few other items, such as occupation, telephone number, and bank account information, on page two of the 1040. When the form initializes, the text boxes in the form populate with data currently contained in related cells of the 1040 sheets. The form has four buttons: Clear, Cancel, Save, and Close. When Clear is clicked, all of the text boxes are emptied and all of the check boxes are unchecked on the user form, the cells in the 1040 sheets that receive information from the form are cleared, and the user form unloads. Clicking Cancel unloads the user form. If Save is clicked, anything currently entered in any of the text boxes is saved to their related cells of the 1040 sheets and the user form unloads. Finally, when Cancel is clicked the user form unloads without any other action taking place.

In addition to 23 text boxes and 10 check boxes, this user form contains five combo boxes. One of the combo boxes is a listing of all of the states in the United States. The other 4 combo boxes contain a list of all of the dependency relationships (i.e., daughter, son, father, mother, etc.) possible. The rowsource for each of these combo boxes is contained in a hidden worksheet titled "Countries_States." We hid this worksheet to create a proffesional appearance and to keep the taxpayer from manipulating any data crucial to the operation of our program.

Step 2: Inputting W-2s

When the taxpayer clicks the step 2 button of our customized ribbon, a user form titled "W-2" initializes. This particular form contains 39 text boxes and 3 check boxes. The purpose of this form is to capture the regular income earned by the taxpayer that is reported on W-2's. The layout of this form exactly matches the design of the W-2 taxpayers receive from employers. Providing taxpayers with an exact replica of the W-2 decreases the likelihood of user errors in inputting data. The left side of the form is informational in nature and the right side contains the income and withholdings information needed to complete the 1040. In addition to the previously mentioned elements, this user form also contains two combo boxes. One of the combo boxes is the same state combo box discussed previously. The other combo box contains a list of the possible codes that can be filled in box 12a, 12b, 12c, and 12d. As was done for the Input Information user form, the rowsource for each of these combo boxes is contained in the hidden worksheet titled "Countries_States."

This particular form contains five buttons: Previous W-2, Next W-2, Save Current W-2, Add New W-2, and Exit W-2. The first two buttons (Previous and Next) allow the taxpayer to navigate between the W-2's he or she has aready input. If the taxpayer clicks Save Current W-2, any information currently contained in the text, check, and combo boxes is saved to a hidden worksheet titled "W-2s" and the taxpayer is prompted with a message box reporting the W-2 was successfully saved. This hidden worksheet acts as a holding place for all of the taxpayerss information as reported on his or her W-2's. Hiding this worksheet is necessary to ensure the worksheet title and categories listed in column A are not altered. Next, if the taxpayer clicks Add New W-2 the contents of all of the text, check, and combo boxes are cleared and the number in the top left corner of the form increases by one, designating how many W-2's are in the return. Lastly, if the taxpayer clicks Exit W-2, the form unloads without anything else happening.

Step 3: Inputting 1098-Ts

The next button the taxpayer can click is step 3, which launches a user form titled"1098-T." This form is intended to capture the information reported to college students from their educational institutions. This form captures that information through 21 text boxes, 8 check boxes, and 4 combo boxes. Two of the combo boxes are the state combo box discussed previously. The other two combo boxes contain a full list of IRS country codes. As was done for the Input Information and W-2 user forms, the rowsource for each of these combo boxes is contained in the hidden worksheet titled "Countries_States." At the bottom of the form, just above the buttons, the taxpayer is posed four questions and allowed to input additional education expenses not reported on the 1098-T he or she received from an educational institution. These five elements are important to completing the second page of the 8853 correctly for each student. Each copy of page two of the 8863 is hardcoded with formulas that determine the availability of education credits to the student. As was mentioned in the executive summary, we determined an average college student to have at most two 1098-T's to input, which means our program is unable to accommodate a situation in which the taxpayer has three 1098-T's. Our reasoning for this is that an average college student can potentially be married to another student who is also a student, but they will not be old enough to have a dependent who is in college and has a 1098-T to declare.

Beyond text, check, and combo boxes, this form included five buttons. If the taxpayer clicks the First 1098-T button, information from the first saved 1098-T is shown and if the Next 1098-T button is clicked the second saved 1098-T is displayed. If the Next 1098-T button is clicked when the second 1098-T is currently displayed, a beep sounds and nothing else happens. When the Save Current 1098-T button is clicked, any information currently entered in text, check, and combo boxes will be saved to the hidden worksheet titled “1098-Ts” and the user is prompted with a message box saying the 1098-t was successfully saved. When the taxpayer clicks Add New 1098-T, the contents of all of the text, check, and combo boxes are emptied for the taxpayer to input a second 1098-T. The Add New 1098-T button will not work until the hidden worksheet for 1098-T’s contains the first 1098-T. This ensures the user saves the inputs done on the first form before moving on to the second form. Clicking exit 1098-T unloads the form and allows the taxpayer to interact with the spreadsheet as normal.

Step 4: Inputting 1099-Ints

After completing step 4, taxpayers can then move to step 4. When the step 4 button is clicked, a fourth and final user form titled “1099-Int” launches. In many instances for college students this will be an optional form to complete because they will not have accrued enough interest throughout the year to have been issued a 1099-Int by a bank or other financial institution. This form contains 32 text boxes and 1 check box. In addition, this user form contains six combo boxes. Four of the combo boxes are the state combo box discussed previously and the other two combo boxes contain the country codes discussed previously.

The five buttons on this form have the exact same functionality as the 1098-T user form. The only difference is that anything input into the 1099-Int and saved is placed into a hidden worksheet titled “1099-Ints.” The most important piece of information captured by this form is the interest income which is reported in the Schedule B and on the first page of the 1040.

Step 5: Calculating tax

When the user clicks the step 5 button two macros run. The first macro, getW2Data, creates a required summary statement of the taxpayer’s income as reported on W-2’s. We created a template for the statement’s layout and then wrote the macro to add rows to the template according to the number of W-2’s the taxpayer inputs. Once the rows are added, the code populates them with information from the W-2’s. This statement is included because it is a standard inclusion for filing with the IRS.

The second macro, TaxCalc, launches after creating the summary statement. The tax calculation relies on the value in cell AA43 of sheet “1040 Page 2.” This value is referred to as taxable income and is calculated through a system of formulas in the worksheets. In order to arrive at taxable income, an appropriate standard deduction (cell AA6 of “1040 Page 2”) is derived using filing status and the value of the exemptions (cell AA8 of “1040 Page 2”) is determined by the number of taxpayers and dependents listed on page one of the 1040. The calculation for these figures relies on a hidden sheet titled “Deductions_Exemptions” and information provided by the taxpayer in steps one through four.

The actual tax calculation is dependent on tax bracket information contained on the hidden worksheet titled “Tax Brackets.” The TaxCalc macro uses a group of nested if-elseif-end if statements to determine which bracket to use for the return. A bracket is selected by the taxpayer's filing status and level of income. Once taxable income runs through this group of if statements, the tax amount is entered in cell AA10 of "1040 Page 2." The tax value then passes through another system of formulas to determine whether the taxpayer is going to receive a refund or be required to pay more taxes. The final action of the TaxCalc macro is to display a message box informing the taxpayer whether they are going to receive a refund or pay additional taxes and the value of the refund/tax due.

Step 6: Printing the return

The final step of our tax preparation solution is to print the return. Clicking the step 6 button launches the PrintForms macro which launches a print preview of the workbook. The maximum number of worksheets that can be included in the print preview is seven, but the number included can be as few as three. The code of the PrintForms macro is meant to exclude incomplete worksheets from the print preview and print only those sheets that the taxpayer needs to file. Once the macro is done, the taxpayer can review the documents to be printed for accuracy and completion. After reviewing the documents in print preview, the taxpayer can then manually finish the printing process by clicking the standard Excel print button. When the taxpayer reopens the workbook after clicking the step 6 button, the worksheets previously hidden for printing purposes are now unhidden again.

Learning and Conceptual Difficulties

Learning

A tedious portion of our project was formatting the user forms the W-2, 1099-Int, and 1098-T user forms to match the layout of the forms the taxpayer will use to input information. In order to match the formatting of these forms we needed to include lines to separate different elements on the page. The user form tool box does not include a line drawing tool, so we had to improvise. The slow and tedious solution we arrived at was using textboxes that had a height of one (if a horizontal line) or a width of one (if a vertical line). Using text boxes to create lines was a slow process, but necessary to match the normal formatting of the documents taxpayers will input.

As our project progressed, we determined both pages of Form 8863 would be needed to complete our project. Unable to find a template of this form online, we turned to Google for a tutorial of how to turn a PDF into a spreadsheet. The process was remarkably easy to do using Adobe Acrobat Pro. With a PDF version of the 8863 open, we were able to select an option to export the file to Excel. The import happened quickly, but resulted in an unpolished design and layout. We were required to tweak the line spacing, but importing the PDF to Excel saved us the time of typing all of the text in the form.

Coding the project turned into quite a task with the vastness of information that needed to be synthesized and imported into the tax forms. Learning methods to do this efficiently turned into a great learning experience. Establishing arrays and loops within loops was an interesting logical experiment that took time to bug test a rework to get the processes to work consistently. Even though there were lots of lines of data, the arrays that we set up helped create a dynamic data set that allows for flexible data interaction.

Designing the forms was also a beast to tackle. Tax forms can be really frustrating and some tax software doesn't work for the variety of forms that employers and institutions send to individuals. We created the forms to be exactly like the standard IRS documents in order to preserve functionality and user experience. In doing so, we learned how to manage design and user interfaces from the forms design interface.

Conceptual Difficulties

One element we included in our initial proposal but were unable to include in our finished project was a web query to find the tax brackets, exemptions, and standard deduction amounts. We were unable to include a web query because we were unable to find a table online capable of being imported using a web query. Not including a web queried information keeps our project from being dynamic from year to year, but the forms change some each year and would need to be updated to serve taxpayers in future years anyways.

Bug testing can always be a frustrating task, but for the most part, it is unavoidable. With the quantity of data possible, creating a dynamic interface presented many ways for our code to break. The amount of time we spent writing code was easily matched by the amount of time we spent bug testing each issue. Learning proficient bug testing methods was critical to creating proficient code that was reliable. We had to creatively come up with ways we could get our code to fail then design exceptions or alternate methods to circumvent those failures. Even when we thought our project was thoroughly vetted, the final pieces we put together in the forms created new bugs that we had to make minor tweaks to accommodate. Overall, bug testing was a conceptual difficulty, but the difficulty presented ways of dynamically writing code as well as a great learning experience for how to write code efficiently.

Assistance

The only assistance we received in completing our project came in the form of templates we found online (https://sites.google.com/site/excel1040/) for the 1040 and Schedule B. In order to be able to manipulate and alter these three worksheets to work with the rest of our project, it was necessary for us to hack a password protection on the workbook. We bypassed the password protection by using a sub procedure we found online (https://uknowit.uwgb.edu/page.php?id=28850). Our reasoning for using this template was to save time formatting and focus more of our energy writing the underlying code.

Exhibit 1

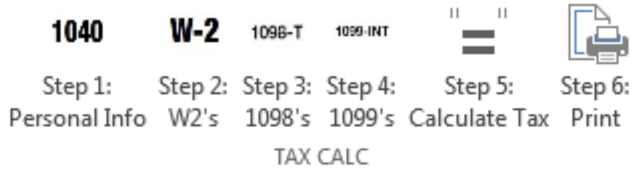
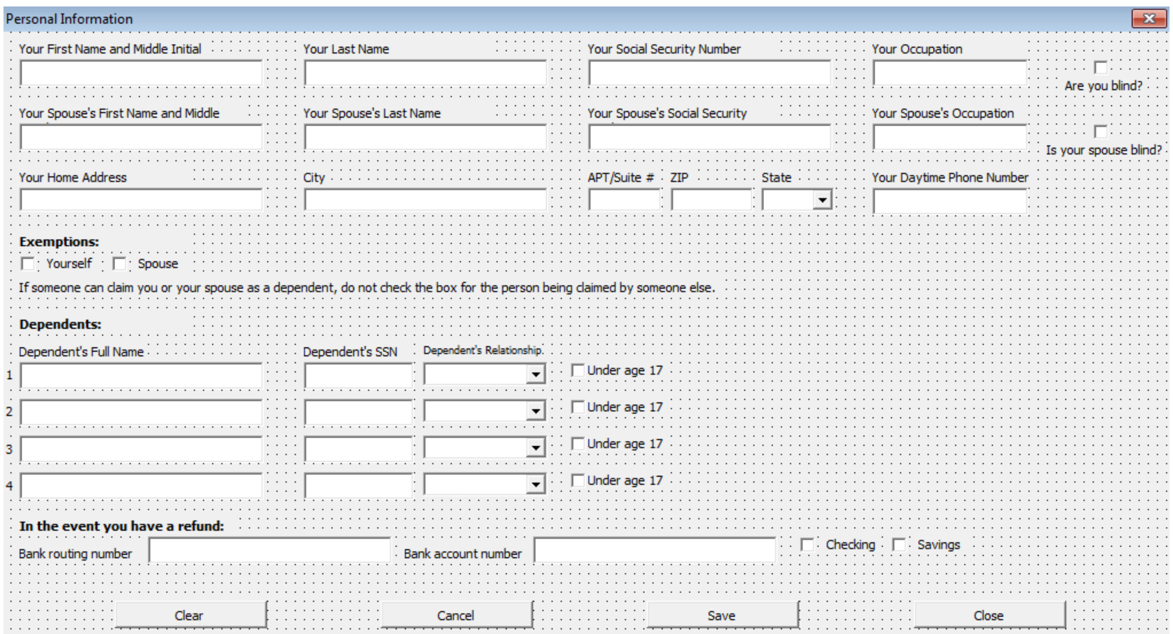


Exhibit 2


Personal Information

Your First Name and Middle Initial | Your Last Name | Your Social Security Number | Your Occupation | Are you blind?

Your Spouse's First Name and Middle | Your Spouse's Last Name | Your Spouse's Social Security | Your Spouse's Occupation | Is your spouse blind?

Your Home Address | City | APT/Suite # | ZIP | State | Your Daytime Phone Number

Exemptions:

Yourself | Spouse

If someone can claim you or your spouse as a dependent, do not check the box for the person being claimed by someone else.

Dependents:

	Dependent's Full Name	Dependent's SSN	Dependent's Relationship	
1				Under age 17
2				Under age 17
3				Under age 17
4				Under age 17

In the event you have a refund:

Bank routing number | Bank account number | Checking | Savings

Clear | Cancel | Save | Close

Exhibit 3

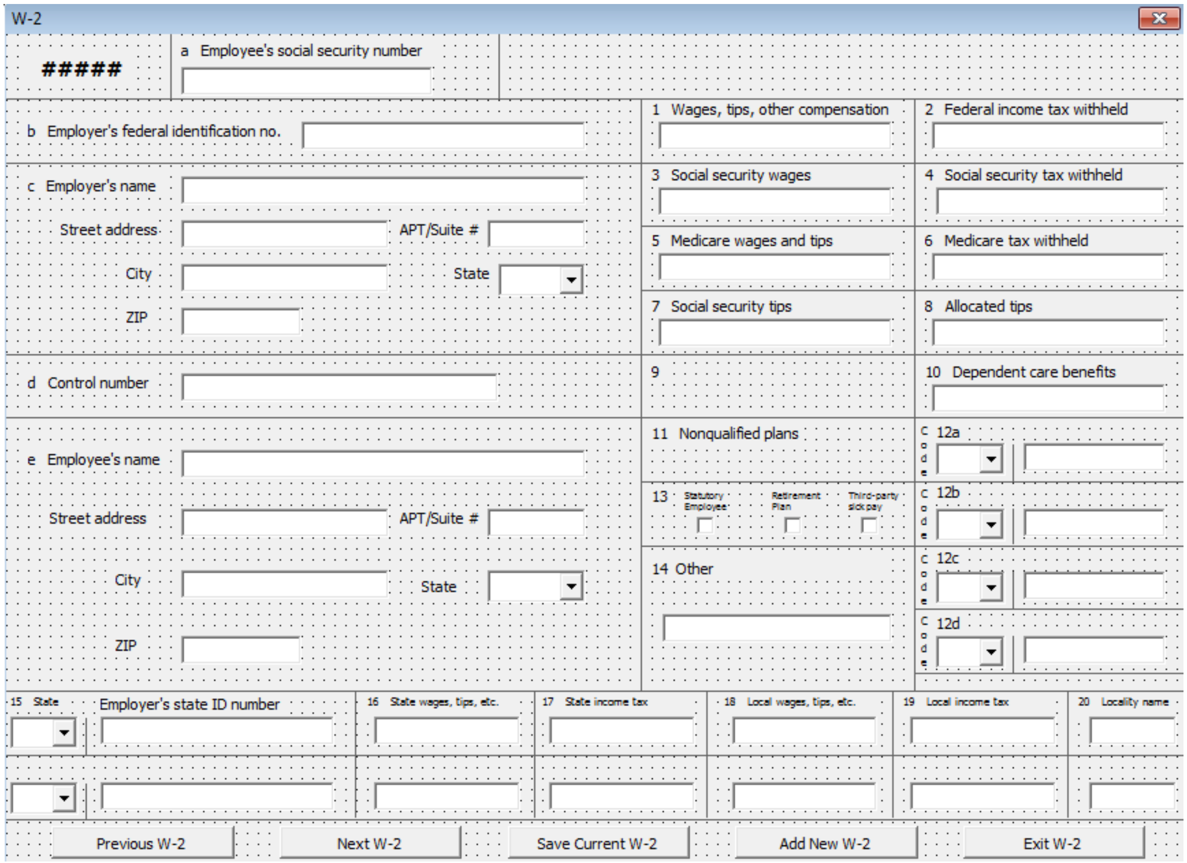


Exhibit 4

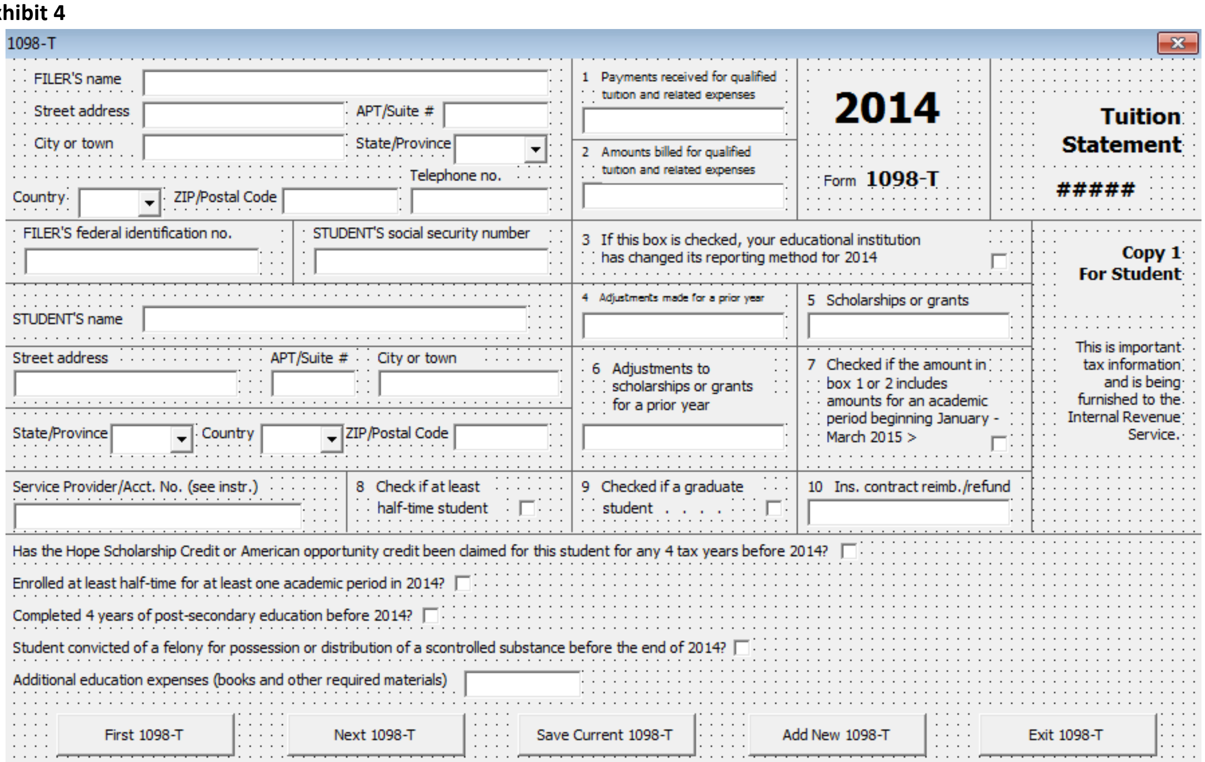
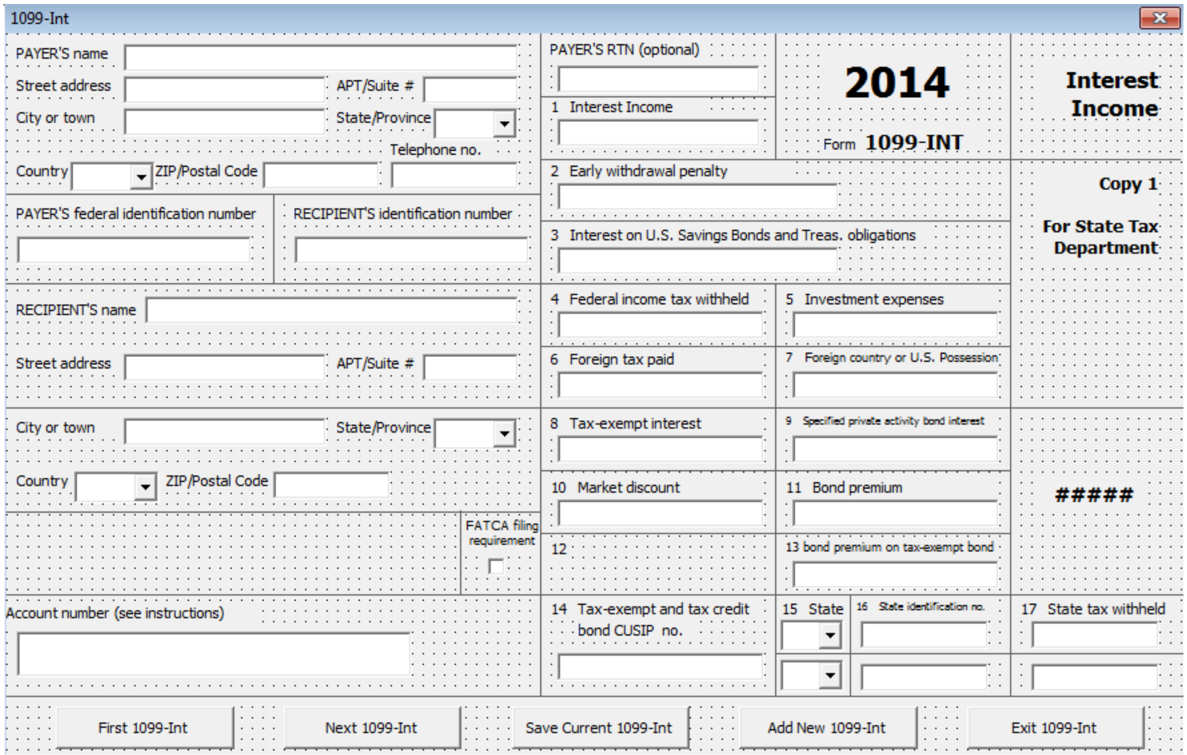


Exhibit 5


1099-Int
PAYER'S name
Street address
APT/Suite #
City or town
State/Province
Telephone no.
Country
ZIP/Postal Code
PAYER'S federal identification number
RECIPIENT'S identification number
RECIPIENT'S name
Street address
APT/Suite #
City or town
State/Province
Country
ZIP/Postal Code
FATCA filing requirement
Account number (see instructions)
PAYER'S RTN (optional)
1 Interest Income
2014
Form 1099-INT
Interest Income
2 Early withdrawal penalty
Copy 1
3 Interest on U.S. Savings Bonds and Treas. obligations
For State Tax Department
4 Federal income tax withheld
5 Investment expenses
6 Foreign tax paid
7 Foreign country or U.S. Possession
8 Tax-exempt interest
9 Specified private activity bond interest
10 Market discount
11 Bond premium
#####
12
13 bond premium on tax-exempt bond
14 Tax-exempt and tax credit bond CUSIP no.
15 State
16 State identification no.
17 State tax withheld
First 1099-Int
Next 1099-Int
Save Current 1099-Int
Add New 1099-Int
Exit 1099-Int