

Brigham Larson Piano Academy: Using VBA to Streamline Tasks

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Executive Summary

This project was completed for the Brigham Larson Piano Academy Program Director. She is responsible for keeping track of their music inventory, selling books to students, ordering more books when levels get too low, and entering them back into inventory when the order arrives. She also must keep track of checked-out books and know which students' books are over due, with the option to renew the checkout. She desires to keep track of all previously checked-out books so that students can later find favorite songs quickly. On top of her inventory and library tasks, she must also manage communication with the parents. This includes sending out general information emails (such as invitations to sign up for a recital time), reminding parents to respond to a particular email if they haven't, and letting every parent know which recital time their children have been assigned. Once that information has been collected, she must arrange the order of the performances in each of several recitals so as to provide variety in the music and allow siblings to perform one after the other; finally, she must type up the recital programs to print off and hand out at the show. This VBA project has automated virtually every responsibility listed above.

Key terms: Library, Inventory, Email, User Forms

Implementation

1) Inventory and Library

(see L_Inventory and Library.xlsm)

On the Inventory sheet, you'll see a long list of all music books in the inventory, organized by Distributor, Item Number, Book Title, Price, Backstock (how many they currently have), Needed Amount (how many they want to end up with when they order more), and Reorder Point (when backstock gets this low, they need to order more). Conditional formatting highlights any rows in red that need to be refilled.

On the Currently Checked Out sheet, you'll find a list of all students who have books checked out, sorted alphabetically by last name. A red row indicates that the book was checked out more than four months ago.

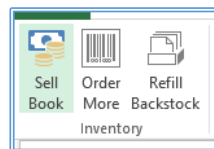
The Previously Checked Out sheet carries a list exactly the same as the Currently Checked Out sheet, except with no color formatting and the date recorded is the date they turned the book back in.

Note that every button in this section will take you to the correct sheet before doing anything, if you are not there already.

- Selling a book

To sell a book to a student, simply select a cell on any row of that book and click the "Sell Book" button in the Music tab of the ribbon. Immediately, the number in the Backstock for that book drops by 1.

Distributor	Item Number	Book Title	Price	Backstock	Needed Amount	Reorder Point
Alfred	AP.17194	Deluxe Starter Kit	\$ 10.35	6	8	5
Alfred	AP.14581	Music for Little Mozarts Lesson Bk. 2	\$ 10.19	5	8	5
Alfred	AP.14584	Music for Little Mozarts Workbook 2	\$ 10.02	6	8	5
Alfred	AP.14583	Music for Little Mozarts Discovery 2	\$ 9.86	12	2	5



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Alfred	AP.14584	Music for Little Mozarts Workbook 2	\$ 10.02	6	8	5
Alfred	AP.14583	Music for Little Mozarts Discovery 2	\$ 9.86	12	2	5

Notice that the row turned red, indicating that by selling the book you dropped it below the Reorder Point.

- Ordering more books

To order more books, click the "Order More" button. Before proceeding, it asks if you are sure. If you click yes, it will take you to the Order sheet and show you each under-stocked book and how many of each you need to get them to the Needed Amount. You may then pick up the phone and make the order.

Order compiled on: April 13, 2016 at 2:44 PM			
Distributor	Item Number	Book Title	Needed Amount
Alfred	AP.17194	Deluxe Starter Kit	3
Alfred	AP.14581	Music for Little Mozarts Lesson Bk. 2	3
Alfred	AP.17180	Music for Little Mozarts Lesson Bk. 3	1
Alfred	AP.518	Jr. Hanon	11

- Refilling the inventory

When your order arrives, you should verify that you received as many of each book as you ordered. If anything has changed, manually adjust the Item Number and the Needed Amount quantity on the Order sheet to match what you will be adding back to the inventory.

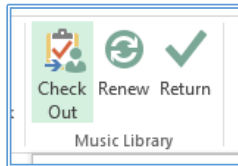
Then, click the “Refill Backstock” button. This finds each book on the Inventory sheet by matching the Item Number, and adds back the quantity you received to the Backstock. The red formatting goes away, and the Order sheet turns grey with a red message, indicating that you have already refilled the order. If you try to refill it again, it will not let you unless you delete the red message. At each step of the process, message boxes appear to coach you along just as I have done in this paragraph.

Order compiled on: April 13, 2016 at 2:44 PM			
Distributor	Item Number	Book Title	Needed Amount
Alfred	AP.17194	Deluxe Starter Kit	3
Alfred	AP.14581	Music for Little Mozarts Lesson Bk. 2	3
Alfred	AP.17180	Music for Little Mozarts Lesson Bk. 3	1
Alfred	AP.518	Jr. Hanon	11
Alfred	AP.596	Czerny Opus 599	7
Alfred	AP.22356	Primer Piano Course Lesson 1A	18

You've already refilled this order.

- Checking out a book

Click the “Check Out” button on the ribbon. If you are not on the Currently Checked Out sheet, it will take you there, then pull up a form for you to manually insert the needed information. Once entered, the form adds the student to the list alphabetically, recording today’s date as the day the book was checked out.



Check Out a Book

Student Name (Last, First)

Music Book

Title

Composer

Publisher

Price

Celebration series

Carr, Hannah	Taylor Swift 1989				11/11/15
Carter, Dallan	Lord of the Rings	Howard Shore	Hal Leonard	\$ 11.99	4/13/16
Chertrudi, Txanton	Best Day of My Life	musicnotes.com		\$ 5.50	9/23/15
Cozzens, Michael	Advanced Hymn Settings	Wolford	Praiseworthy	\$ 7.95	9/21/15

- Renewing a book

Simply select any part of a row with a student's checked-out book and click the "Renew" button. This will add another four months to the date in the Date Checked Out column, noting the original checkout date off to the side. The book may be renewed as many times as necessary, and the original checkout date does not change.

Bergero, Emily	Favorite Classic Melodies bk 2	Bastien			3/21/15	
Carr, Hannah	Taylor Swift 1989				3/12/16	Original Checkout Date: 11/11/15
Carter, Dallan	Lord of the Rings	Howard Shore	Hal Leonard	\$ 11.99	4/13/16	
Chertrudi, Txanton	Best Day of My Life	musicnotes.com		\$ 5.50	9/23/15	
Cozzens, Michael	Advanced Hymn Settings	Wolford	Praiseworthy	\$ 7.95	9/21/15	

- Returning a book

Select any part of a row on the Currently Checked Out sheet, then click the "Return" button. This removes the student from the Currently Checked Out sheet and adds him or her to the Previously Checked Out sheet, organized alphabetically by last name and recording the date it was checked back in.

Bird, Jared	Tarantella Viva!	Bober	FJH	\$ 2.95	11/13/15
Carter, Dallan	Lord of the Rings	Howard Shore	Hal Leonard	\$ 11.99	4/13/16
Chertrudi, Txanton	Primary Passages bk. 1				9/23/15
Cummins, Arthur	The Magic of Music bk 2	Alexander	Alfred	\$ 5.95	7/27/15

2) Email and Recitals

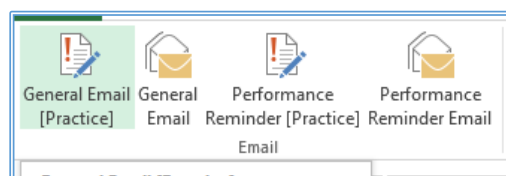
(see L_Email and Recitals.xlsm)

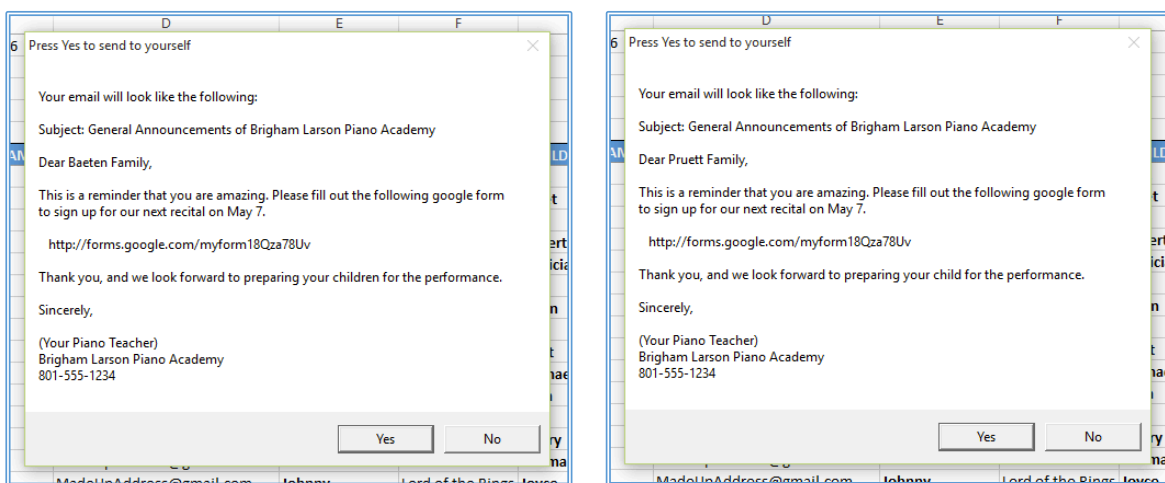
Each row on the Master sheet represents one family, including one of the parent's first names, their last name, each child enrolled at the Piano Academy (up to four) and the song that each child will perform at the upcoming recital. At the top of the Master sheet, you'll see the upcoming recital date and the available recital times for the parents to choose. The far right columns include a list of who has actually responded, which recital time each family belongs to, and how many *songs* each family will perform at the recital (not how many children are enrolled). The top of the worksheet has a total performances column to show how many have been scheduled to play during each recital.

The following six sheets are simply three replicas of the same thing: a rough-draft recital sheet followed by the finalized recital program, each pair denoted with an A, B, or C, representing the first, second, or third available recital time, respectively. The rough draft sheet is used to rearrange performances until satisfied, and the finalized recital program sheet builds off the rough-draft to create a printable, presentable program to hand out at the show.

- Sending a general email (Practice)

Select any cell in the list of families, click the "General Email [Practice]" button on the Email/Recitals tab of the ribbon, then select the .txt file you will use as a template (we will use L_general_email.txt in our example). A message box will appear with the modified template, matching the family you have selected. Try it with several families to make sure it works as desired.





Note: Any of the column headers in the Master sheet that begin with “<” and end with “>” in all caps can appear in your template, and they will then be replaced with the appropriate value. Additionally, you can use the key word <CHILD_REN> in the template to represent the word “children” for those who have several enrolled, or “child” who only have one enrolled. The first line will always be the subject of the email.

If you click “Yes,” you will be asked for your email credentials and the email will be sent to your inbox so you can view it in that setting as well.

- Sending a general email

This procedure uses the exact same code as the practice version does, so if the practice email looks how you like it to, then click the “General Email” button to send a unique email to everyone in your list. However, before sending, you have the option to specify if this email is intended to get a response from those who have not responded. If so, the email will only send to those individuals whose Responded column says “No.”

A word of caution: because parents have different numbers of children enrolled, you should refrain from using the <CHILD [#] NAME> key word in the template. The program *will* delete the key word if there is no child to take its spot, but any words between the code words will *not* be deleted.

For example, a template reading

“Please remind <CHILD 1 NAME> and <CHILD 2 NAME> and <CHILD 3 NAME> and <CHILD 4 NAME > of the need to practice before the recital.”

would turn out as follows with a family of two enrolled children:

“Please remind Jeffrey and Clarissa and and of the need to practice before the recital.”

- Sending a performance reminder email (Practice)

This button, reading “Performance Reminder [Practice],” serves the same purpose as the General Email Practice button. You will get the chance to see the email and send it to yourself before sending it out to everyone. The difference lies in the format of the

template (we use L_performance_reminder_email.txt in this example). This VBA code is specifically designed to remind the parents which songs each of their children are playing, when their recital will be, and it will also adjust the email to the number of children they have enrolled. The children's names and songs must have the exact form:

```
Schedule for the <RECITAL DATE> recital
Dear <PARENT FIRSTNAME>,

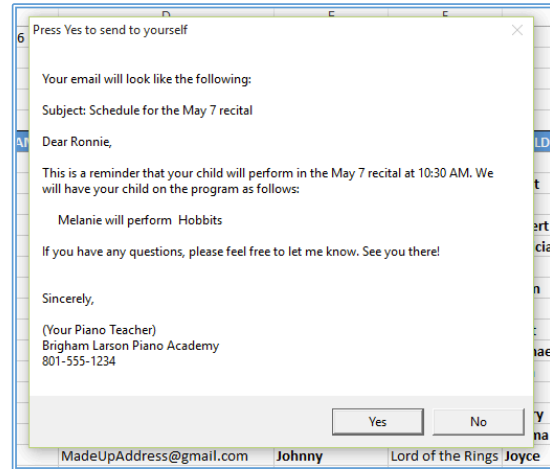
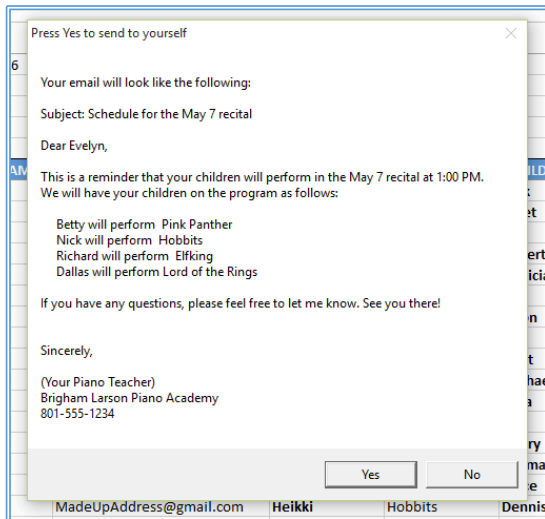
This is a reminder that your <CHILD_REN> will

<CHILD 1 NAME> <CHILD 1 SONG>
<CHILD 2 NAME> <CHILD 2 SONG>
<CHILD 3 NAME> <CHILD 3 SONG>
<CHILD 4 NAME> <CHILD 4 SONG>

If you have any questions, please feel free

Sincerely,
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This code deletes any lines where there are no children present, so that for a one-child-enrolled family, for example, the email does not have four empty white lines of text before the concluding paragraph. Consider the following two screen shots, one from a four-children-enrolled family, and one from a one-child-enrolled family:



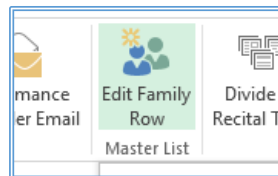
Note that the recital times were different as well, indicating to the parents when to arrive.

- Sending a performance reminder email

Once you are satisfied with the practice email appearance, click the “Performance Reminder Email” button to send it out to each person listed. This process records in the far left column what time the email sent or writes “Failed” if it did not send. Note that this email *only* sends to those who have “Yes” in their Responded column, and each child should have a song next to his or her name. If a child has decided not to perform, delete the child's name from the list before sending the email.

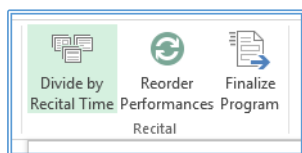
- Editing a family

To add, delete, or change family information, you have the option of using a form that will do it all conveniently for you; the form can also move quickly between family records. Simply click the “Edit Family Row” button and whichever family’s row you have selected will appear in the form. Click “Next” to save changes made to that family and move down one, or “Previous” to go up. Click “OK” to finish, or “Cancel” to discard any changes and close the form. Note that you may also use this to add a family at the bottom of the list.



- Dividing the performances into their recitals

Once everyone has been assigned a recital time, click “Divide by Recital Time.” This button will place everyone onto the correct recital draft sheet along with the songs they are performing. For example, if the first recital is 10:30 AM, then Recital A Draft will have all those students signed up to play at the 10:30 AM recital. If a particular child does not have a song, he or she will not appear in any recital draft.

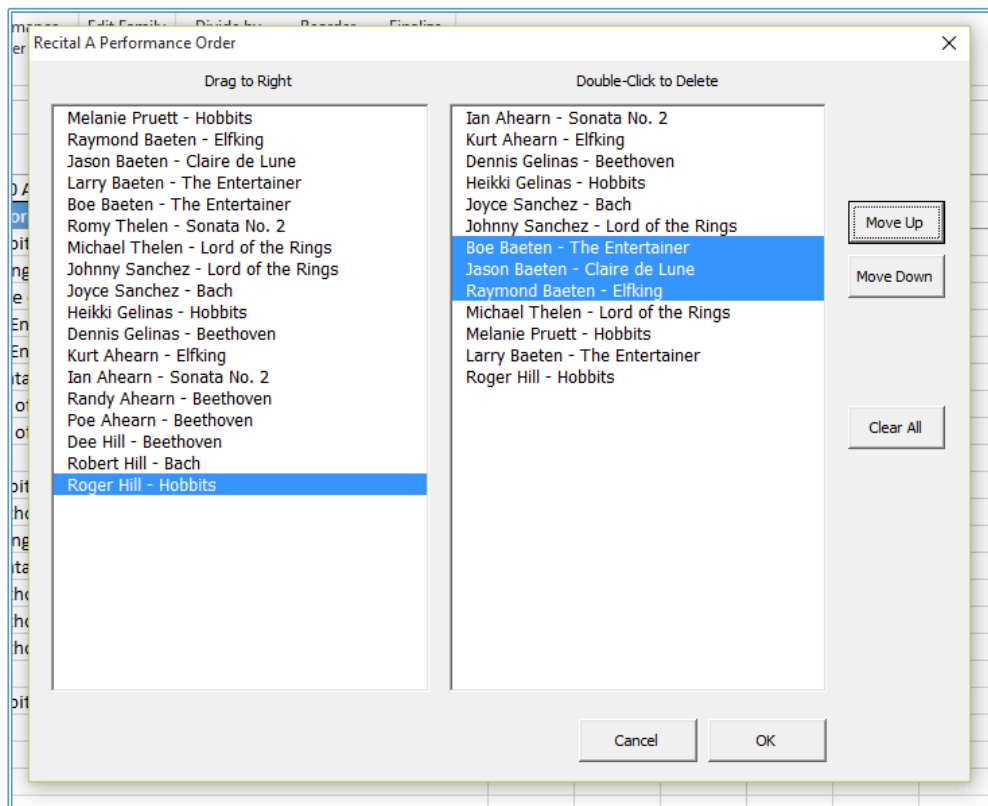


Recital Time: 10:30 AM	
Student	Performing
Melanie Pruett	Hobbits
Raymond Baeten	Elfking
Jason Baeten	Claire de Lune
Larry Baeten	The Entertainer
Boe Baeten	The Entertainer
Romy Thelen	Sonata No. 2
Michael Thelen	Lord of the Rings

- Rearranging the performance order

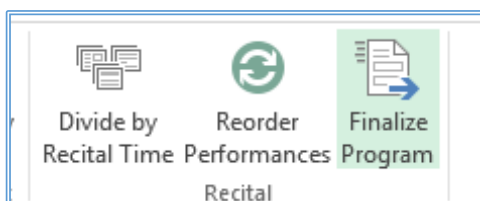
To decide on the performance order you like best, select one of the three Recital Draft sheets and click “Reorder Performances.” This brings up a large user form with two list boxes. The list on the left pairs each child with his or her song. You can then drag each performance to the right to build the right-hand list box up in any order you please. Simply double-click a child to delete him or her from the right list box, or select any child or children and press the “Move Up” or “Move Down” keys to move the selection up or down the list.

Once you are satisfied, click “OK” and the Recital Draft sheet will reflect the changes you’ve made.



- Finalizing the program

Finally, when the children and their songs are in a pleasing order, select any Recital Draft sheet and click the “Finalize Program” button to send them all to the corresponding Recital sheet in a neatly formatted order. You may now print off the recital form to hand out at the performance.



Learning and Conceptual Difficulties

I learned that VBA is not and should not be entirely independent of Excel's non-VBA features, such as conditional formatting, data validation, and the options available in the "Home" tab of the ribbon. Having VBA do all those things would, in many cases, only add an unnecessary burden to the programmer.

I learned the importance of the recording feature in the Developer tab. Much of what I accomplished could not have happened without it. I used the record feature to record myself changing the font style to bold for only one half of a string of text (see the finalized Recital tabs in the "Email and Recitals" workbook), I used it to know how to automatically sort a range of constantly changing size, and I used it to know how to make the entire sheet re-calculate.

I had the greatest difficulty with the user form that enables you to change the order of the children performing in a recital, especially when I was trying to figure out how to delete a student from the right-side list box. My sub gave me error after error, and usually it was "Unidentified." This was frustrating, but I eventually arrived at a method that worked.

The next most difficult sub procedures were the four different emailing buttons. Just sending out a mass email like we did in class is very simple. However, these emails need to be dynamic, adjusting to the number of children each parent has enrolled in the Piano Academy and listing information about each child, but only as many as they have enrolled. I did this by creating a dynamic version and a general version. The general version should not mention specific children, or it will come out wrong.

I also learned about the Application.ScreenUpdating and Application.Calculation properties, both of which helped my user form move faster between entries (the Edit Family user form on the Master sheet of the "Email and Recitals" workbook). Previously, any time I pressed "OK," "Next," or "Previous," the form waited about a second before changing. Now, it moves quickly.

Lastly, I learned the importance of trial and error. On several occasions, I thought I had thought of every possible situation, then I accidentally came across a different situation, ran a macro, and got strange results. Thus, I found it very important to spend time "playing" with each sub procedure, clicking things repeatedly, deleting data, adding data into new places, and watching what happens. This makes the code very robust.

The only thing I didn't accomplish but intended to was finding a way to transfer data from a Google sheet online (where the parents sign up for recital times) straight into the Master sheet in the "Email and Recitals" workbook. For now, this must be done manually, but that may provide a good opportunity to proofread all the data. I am confident I can find a way to do so, but I ran out of time.

Assistance

I used the internet as my go-to resource for difficult-to-achieve coding, particularly for the .ScreenUpdating and .Calculation properties for improved speed, the drag-and-drop feature of my two list boxes, and the list box element deletion. Besides the internet, I received no assistance.