

Adam Cuppett
MBA 614
Winter 2010

Final Project – Textbook List Price Aggregator

Anyone who has purchased books from the BYU Bookstore knows how expensive textbooks can be. With the advent of the Internet and online bookstores like Amazon.com and Half.com, students now have an alternative to the ridiculous prices offered at the BYU Bookstore. There are many websites that sell books themselves from their own inventories and also offer an online medium for others to sell their new and used books to the public. The challenge is that going through multiple websites and building a spreadsheet of all the options can be very tedious and time consuming. I have created a program that will drastically decrease the time required to build a robust price list. In fact, all you need to do is enter a BYU Route Y Net ID, a valid password, and the semester or term for which you will be buying books and the rest is done for you.

Implementation

The first angle of attack was to get the book list off of the BYU Route Y system. Students have the option to select a book list for each semester, as illustrated in the picture below.

The screenshot shows the BYU Book List website interface. At the top, there's a navigation bar with "BYU | BRIGHAM YOUNG UNIVERSITY" and "BYU Book List". Below this, there's a sidebar with "MYBOOKLIST OPTIONS" including links like "mybooklist", "Books by Course", "FAQ", "Finding Books", "NEW A to Z Layout", "Textbook Floor Map", "Reading Shelf Tags", "Payment Options", "Purchase Textbooks Online", "Lines on the text floor", "Webcams", "Budgeting for Books", "Why So Expensive", "How We're Lowering Costs", "Textbook Return Policy", "Sell Your Book", "To the Bookstore", "To a Wholesaler", and "Book Exchange".

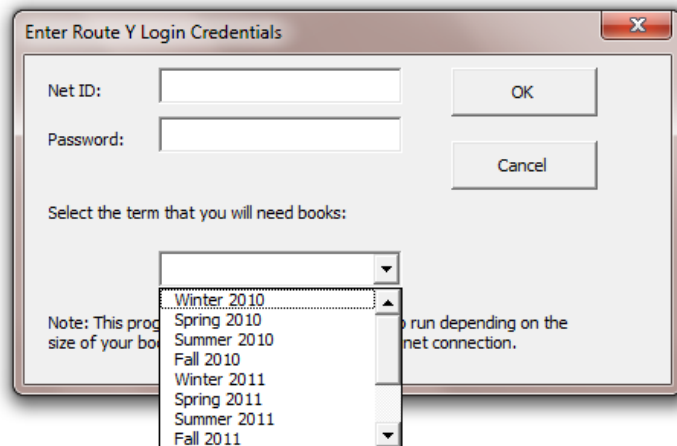
The main content area features a dropdown menu set to "2010 Winter" and a "GO" button. To the right, there's a "Search for books by Course" link and a "Buy mybooklist" button with the BYU logo.

Below the search area is a table of required textbooks:

Req/Opt	Author	Title	ISBN	Course	Used/New	Price
(required)	ALBRIGHT	DATA ANALYSIS & DM W/ MS EXCEL W/ CD 3E REV PKG	9780324662443	M B A 607 : 1	no info	\$184.00
(required)	ALBRIGHT	ACP STATISTICS FOR MBA FINANCE 3E	9781424060948	M B A 607 : 1	no info	\$56.00
(required)	ALBRIGHT	VBA FOR MODELERS 3E	9781439079843	M B A 614 : 1	no info	\$103.70
(required)	CHRISTENSEN	INNOVATORS SOLUTION	9781578518524	M B A 580 : 2	no info	\$32.95
(required)	FRIEDMAN	THE WORLD IS FLAT 3.0	9780312426074	M B A 584 : 2	no info	\$16.00
(required)	GARRISON	MANAGERIAL ACCOUNTING 13E	9780073379816	M B A 502 : 2	no info	\$196.70
(required)	HANSEN	PACKET STRATEGY FORMULATION (W/ACCESS CODES)	9780700397792	M B A 580 : 2	\$64.75/\$86.30	
(required)	LERNER	VENTURE PRIVATE CAPITAL EQUITY CASEBOOK 4E	9780470224625	M B A 664 : 1	no info	\$185.30
(required)	MONEY	PACKET GLOBAL MANAGEMENT	9780700377640	M B A 584 : 2	\$23.55/\$31.40	
(required)	STICE	INTERMEDIATE ACCOUNTING 17E	9780324592375	M B A 524 : 1	no info	\$220.00
(required)	STICE	PACKET FINANCIAL STATEMENT ANALYSIS	9780700399383	M B A 527 : 1	\$30.90/\$41.20	

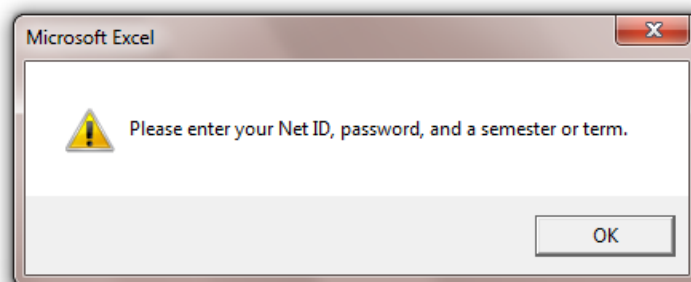
At the bottom, there's a small disclaimer: "Information and pricing on this page is subject to change. Please see the Bookstore for the latest information."

My program starts when the user hits the start button, opening a userform that allows the shopper to input their Net ID, their BYU Route Y password, and chose the semester or term for which they would like the book list.

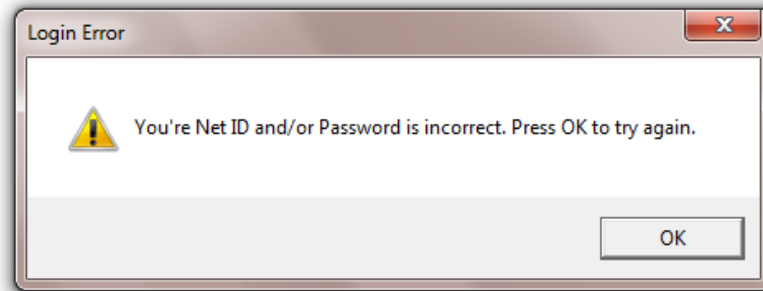


The screenshot shows a userform titled "Enter Route Y Login Credentials". It contains three input fields: "Net ID:", "Password:", and a dropdown menu labeled "Select the term that you will need books:". The dropdown menu is open, showing a list of terms: "Winter 2010", "Spring 2010", "Summer 2010", "Fall 2010", "Winter 2011", "Spring 2011", "Summer 2011", and "Fall 2011". There are "OK" and "Cancel" buttons on the right side. A note at the bottom left states: "Note: This program may take up to ten minutes to run depending on the size of your book list and your internet connection."

Once the user hits the OK button, he can sit back and wait for the program to work its magic. Depending on the size of the student's book list and the speed of the internet connection, this process can take up to ten minutes. This time frame is noted on the initial userform window displayed above to warn the user that it may take some time to complete their request. To make sure that the program runs properly, I added a check to make sure that all of the information requested of the user has been entered. If the user leaves any of the inputs empty, they will see this message:



If they do fill all the input boxes but mistakenly type in the incorrect information, they will see a different warning that their Net ID and/or password was incorrect. This warning displays after the system has attempted to log in to Route Y and returns an error saying that the user information is not correct.



The program uses the following code to initialize Internet Explorer and enter the user's information into the Route Y log in screen. The internet browser then navigates through a series of pages, checking boxes to agree to the terms and conditions, and then finally arriving at the final page where the book list information is contained.

```
'Loads the user info into the login page on Route Y
waitForLoad
ie.document.all("USER").Value = un
ie.document.all("PASSWORD").Value = pw
ie.document.all("Login").submit

waitForLoad
ie.navigate "https://booklist.byu.edu/ry/mybooks.cfm"
waitForLoad

'Checks to ensure the user name and password are valid
If Instr(1, ie.document.Location, "login.fcc") <> 0 Then
    MsgBox "You're Net ID and/or Password is incorrect. Press OK to try again.", _
        vbExclamation, "Login Error"
    waitForLoad
    ie.Quit
    Exit Sub
End If

'Checks the "Agree to terms" box and hits the agree button
waitForLoad
ie.document.all("disclaimer").Click
ie.document.all(83).Click

'Opens the Route Y book list page
waitForLoad
ie.navigate "https://booklist.byu.edu/ry/mybooks.cfm?year_term=" & yearTerm

'Saves the book list as a HTML file into the local folder
waitForLoad
saveFile ThisWorkbook.path & "\bookpage.html", ie.document.all(1).outerhtml

'Logs out of Route Y and closes IE
ie.navigate "https://booklist.byu.edu/logout.cfm"
waitForLoad
ie.Quit
```

The program then takes the book list and saves it as an HTML file that is saved in the local folder where the program is being run. After this file is saved, the program logs the user out of Route Y to prevent unauthorized access to their account and closes the Internet Explorer browser.

Since the online booksellers don't sell the course packets of articles and cases, my program will list the complete book list at the top of the page (including packets), but it filters out the packet information and does not return a book price matrix for these packets. This process is achieved with the following code:

```
'Loops through to filter out the packets since they aren't sold in other locations
Sheets("TempData").Select
Range("A18").Select
Do While IsEmpty(ActiveCell.Offset(1, 0)) = False
    Cells.Find(What:="Packet", After:=ActiveCell, LookIn:=xlFormulas, _
        LookAt:=xlPart, SearchOrder:=xlByRows, SearchDirection:=xlNext, _
        MatchCase:=False, SearchFormat:=False).Activate
    ActiveCell.Offset(0, -2).Select
    With ActiveCell
        Range(.Offset(0, 0), .End(xlToRight)).Select
    End With

    Selection.Delete Shift:=xlUp
    ActiveCell.Offset(-1, 0).Select
Loop
```

By eliminating the packet information, the program is able to finish the query much more quickly and avoids program errors. On some of the websites, if the seller's system is unable to find the book or ISBN then they return an error that is not handled by my VBA code, so this problem is eliminated with the code above.

Now that the program has loaded the book list, Excel will take the ISBN's and go crawl four websites for book price information—Amazon.com, Half. Com. BooksaMillion.com, and Textbooks.com. After each web query, the program searches the data for the cheapest price for any given book condition—new, like new, very good, and good. The price data is then entered into the book price matrix, the lowest price is located and highlighted, and the book price matrix is loaded onto the main page. The program finds and highlights the lowest price by using the following code:

```

'Highlights the lowest price for each book
Dim rng As Range, iMin As Variant
Set rng = Range("A6:F18")
iMin = Application.WorksheetFunction.Min(rng)
rng.Find(What:=iMin, After:=rng.Range("A5"), LookIn:=xlValues, _
    LookAt:=xlPart, SearchOrder:=xlByRows, SearchDirection:=xlNext, _
    MatchCase:=False).Select

With Selection.Interior
    .Pattern = xlSolid
    .PatternColorIndex = xlAutomatic
    .Color = 65535
    .TintAndShade = 0
    .PatternTintAndShade = 0
End With

```

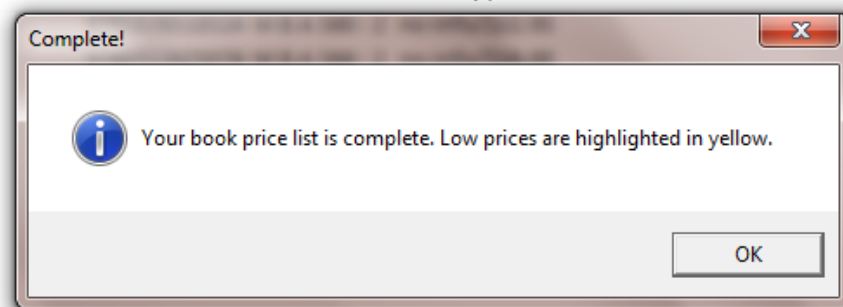
With the book price matrix now loaded onto the main page, the program clears the data and existing formatting to prepare for the next series of data for the next book. This process is accomplished with a For Loop that loops through the matrix, clearing the appropriate cells with each pass.

```

'Clears the prices and highlighting of five ranges to prep for the next book
Range("A2").Select
For i = 1 To 5
    ActiveCell.Resize(1, 6).Select
    Selection.ClearContents
    With Selection.Interior
        .Pattern = xlNone
        .TintAndShade = 0
        .PatternTintAndShade = 0
    End With
    ActiveCell.Offset(4, 0).Select
Next

```

Once the program has finished the queries and has loaded all the book list matrices, it is ready to display the final book list and notify the user with the following window:



This window also gives the reminder that the finished book list has highlighted the lowest price for each book. The program outputs a complete list of all the books and packets needed for each of the classes for the given semester.

Get Book List from Route Y and
Find Prices on the Internet

Req/Opt	Author	Title	ISBN	Course	Used/New Price
(required)	ALBRIGHT	DATA ANALYSIS & DM W/ MS EXCEL W/ CD 3E REV PKG	9780324662443	M B A 607 : 1	no info/\$184.00
(required)	ALBRIGHT	ACP STATISTICS FOR MBA FINANCE 3E	9781424060948	M B A 607 : 1	no info/\$56.00
(required)	ALBRIGHT	VBA FOR MODELERS 3E	9781439079843	M B A 614 : 1	no info/\$103.70
(required)	CHRISTENSEN	INNOVATORS SOLUTION	9781578518524	M B A 580 : 2	no info/\$32.95
(required)	FRIEDMAN	THE WORLD IS FLAT 3.0	9780312425074	M B A 584 : 2	no info/\$16.00
(required)	GARRISON	MANAGERIAL ACCOUNTING 13E	9780073379616	M B A 502 : 2	no info/\$196.70
(required)	HANSEN	PACKET STRATEGY FORMULATION (W/ACCESS CODES)	9780700397792	M B A 580 : 2	\$64.75/\$86.30
(required)	LERNER	VENTURE PRIVATE CAPITAL EQUITY CASEBOOK 4E	9780470224625	M B A 664 : 1	no info/\$185.30
(required)	MONEY	PACKET GLOBAL MANAGEMENT	9780700377640	M B A 584 : 2	\$23.55/\$31.40
(required)	STICE	INTERMEDIATE ACCOUNTING 17E	9780324592375	M B A 524 : 1	no info/\$220.00
(required)	STICE	PACKET FINANCIAL STATEMENT ANALYSIS	9780700399383	M B A 527 : 1	\$30.90/\$41.20

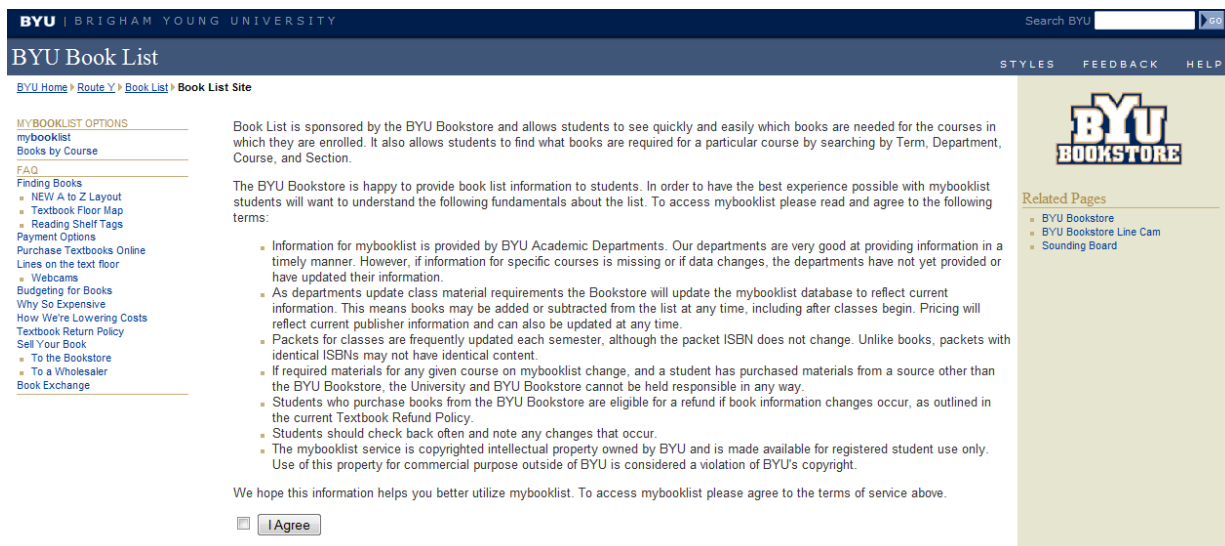
Below this complete list follows a matrix of prices for each book on the list. Notice that the book price matrix displays at the top the information given by Route Y, including the new and used price of the book from the BYU Bookstore. Below that data, you will see a listing of the prices offered by each online bookseller. Also, the lowest price in the matrix for that specific book is highlighted in yellow.

Req/Opt	Author	Title	ISBN	Course	Bookstore's Used/New Price
(required)	ALBRIGHT	VBA FOR MODELERS 3E	9781439079843	M B A 614 : 1	no info/\$103.70
BooksAMillion.com					
	<u>New Price</u>	<u>Club Price</u>			
	\$120.95	\$108.85			
Amazon.com					
	<u>New from Amazon.com</u>	<u>New from Private Seller</u>	<u>Like New</u>	<u>Very Good</u>	<u>Good</u>
	\$98.95	\$90.00	\$101.43	\$116.87	\$79.52
Half.com					
	<u>Brand New</u>	<u>Like New</u>	<u>Very Good</u>	<u>Good</u>	
	\$87.08	\$94.00	\$149.69	\$149.69	
Textbooks.com					
	<u>New from Textbooks.com</u>	<u>Used</u>	<u>New from Private Seller</u>	<u>Like New</u>	<u>Very Good</u>
			\$87.08	\$98.95	\$79.52

More of these matrices will follow depending on the number of books that are being priced. The program will continue to march down the page adding as many matrices as necessary to complete the entire book list. If the user needs to start a new query for a different semester, they simply need to push the button again and the system will clear out the old data and start all over.

Learning Outcomes

One concept that was vital for me to learn with this project was the ability to analyze HTML code and find where I needed to click boxes and hit buttons. Before I could get to the book list on Route Y, I encountered a page that required accepting the terms and conditions of the BYU Bookstore.



The button was not labeled in the HTML code, so I had to use a For Loop to go through the code and find the corresponding number of each link or object. Once I found that, I was able to continue with the VBA coding and call the link #83.

```
'Checks the "Agree to terms" box and hits the agree button
waitForLoad
ie.document.all("disclaimer").Click
ie.document.all(83).Click

'Opens the Route Y book list page
waitForLoad
ie.navigate "https://booklist.byu.edu/ry/mybooks.cfm?year_term=" & yearTerm
```

Another key lesson that I learned with this assignment is the need for error checking and debugging. Although I had used the debugging process somewhat in the homework assignment throughout the semester, I really learned the value of the debugger, and especially the need for using breakpoints in the code. I can't even explain how much time I was able to save by setting a few breakpoints, and then stepping through the code one step at a time to see what was wrong and what I could do to fix the problem. Without the breakpoints, this project could have

easily taken 10-20 more hours to complete, thus taking time away from me adding some other necessary functionality.

Furthermore, learning to use loops and with constructions allowed me to build this project with much more grace and effectiveness. I started out coding repetitive actions the hard way, but I soon learned how powerful and efficient loops can be. In some instances, I combined For Loops, Do While Loops, If statements, and With constructs in the same action. This made my code run much more quickly and eliminated some of the errors that come with coding incessant lines of code.

Finally, the key takeaway for me in this project is that no matter how much you may try, errors can always pop up. After I had gone through the entire project and I thought I was finished, I used someone else's book list with different books and ISBN's and received some new errors that I hadn't seen before. I went through this process three times until I had eliminated all errors. This taught me the valuable lesson that no matter how much testing you do, there is probably more testing and debugging that can be done to make sure the project can handle every possible scenario.