VBA Final Project

MBA 614—Spreadsheet Automation and Modeling

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December 6, 2012

Executive Summary:

Custom Carpets & Vinyl, LLC is a small carpet and flooring store located in Springville, Utah. The business consists of the owner and one employee, and that one employee happens to be a close relative of mine (my mom). The business is run with virtually no use whatsoever of technology, the exception to that rule being one computer. Although the computer is not connected to the internet, it does have Excel, and several years ago in 2006 I made a spreadsheet for the store so they could keep information on their customers and records of what customers ordered and when, which would then enable them to find the filed hard-copy documents for those transactions more easily if needed. Although the spreadsheet was good, I did not at the time have the skills needed to automate it; it was therefore somewhat difficult to use and was not well implemented. Also, the data that was input was not very uniform. In this project my goal was to:

a) Set up a more user-friendly interface for the spreadsheet that would make it easier to use and understand.
b) Create a system that would take any inputs and make the resulting records more uniform and usable.

The interface I produced accomplished these two tasks and made the spreadsheet and also the data produced more accessible to those using it for any future needs the business might have.

Implementation:

User Input. In implementing this project, I wanted to have the input of those who would be using the interface so that it would fit *their* needs and objectives. Early on I sat down with my mom and we discussed what the possibilities were with a project like this and what she wanted it to do. Because the main functions of the interface would be creating new records and recalling records, I showed her what the user form for putting in data might look like. I then asked her which of these inputs she would likely be using to search for past records. The four criteria she listed were: customer's first name, customer's last name, the product that was sold, and the mill or distributor the product comes from.

As the project went on we decided there were four functions that I should build into the interface, they are:

1. Add new records to the spreadsheet
2. Edit existing records in the spreadsheet
3. Find records based on the customer and what was ordered
4. Find customers based on any combination of name, city, and phone number

Building the Interface. I started out building four user forms, but I later decided I could accomplish the same tasks using only two user forms but making them function like four; the forms are:

- frmAdd
- frmFind

Making these forms act like four was done by putting two sets of buttons on each form; the buttons are layered so both sets show up in the same location on the form, but only one set at a time is visible and therefore accessible to the user. Along with which buttons are visible, the caption of the form itself changes, as well as the captions of several labels that mark text boxes, and there are also a few labels that do not show up at all on one configuration or the other. What determines which configuration shows up is what function the user has indicated they are doing based on answers to message box prompts or which command buttons or buttons in the ribbon were clicked.

The interface that I built and how it works is modeled in a flowchart included in this document (Exhibit 1). The process begins without any user input when the workbook is opened and a message box asks what the user would like to do. Each of the decision points, modeled as red diamonds, is implemented using a message box that asks a simple yes or no question. The user inputs are modeled by the gold parallelograms; these represent the actual user forms where the user puts data or search criteria into the system. The green rectangles are where a command button is clicked by the user and the user inputs are taken from the forms and either processed and entered into the spreadsheet as new data or used to retrieve records from the data already in the spreadsheet.

To illustrate how the interface works I went through the process of adding a new record for an existing customer and included screenshots of what each step looks like. The path that I followed is shown by the bold green flow lines in the Exhibit 1 flowchart, and the bold letters (**A**-**H**) in the flowchart elements correspond to the screenshots with the same letter. I started with the message box that appears when the workbook is opened (**A.**) and ended with the message box that asks if you would like to add another record (**H.**) and closes the forms if the user responds “No”.

Once the user forms are closed, they can be reopened by clicking one of the four buttons on the “Records” tab of the Excel ribbon. The four buttons in the ribbon correspond directly to the four functions mentioned previously that we (my mom and I) decided we wanted the interface to be able to do. I also included at the end of this document a screenshot of these four buttons (Exhibit 2). The four buttons in the screen shot are numbered **1**-**4**, and below the screenshot of the buttons are four corresponding screenshots that show what opens when each button is clicked. Also, on the Exhibit 1 flowchart some of the elements contain numbers **1**-**4**

corresponding to these buttons and indicating the point in the interface the user enters when each button is clicked. From there, the user is able to continue through the processes listed in the flowchart and therefore the interface as if they had entered it from the beginning when the initial message box prompt appeared.

Uniform Data. Along with making the spreadsheet more user-friendly, my other objective in this project was to make the data and records produced more uniform. I wanted to accomplish this in such a way that the program would be robust enough that errors, including logic errors, could be limited if not eliminated. I did several things to do this, a few of which I will discuss.

First, I made it so that both a first and last name must be entered; if there is not a first and last name present, a message box pops up telling the user that they must include a first and last name for the record. I also made it so that no matter how the names are input, they will show up in the spreadsheet with proper capitalization: for instance if I were entering a name and accidentally hit the Caps Lock button, I may enter it as "rOBERT mILLS", but "Mills" and "Robert" would show up in the spreadsheet under the "Last Name" and "First Name" columns respectively. I also set up many of the other text box inputs so that the first letter of the information entered will be capitalized; this can be seen in screenshot **G.** where wood is not capitalized in the user form, but in the record produced (which shows up as the last populated row) the W is uppercase. Also in screenshot **G.** you can see that in the user form the measurement "50 x 46" contains spaces, but these have been removed in the record entered; this was done to facilitate the separation of the measurement from the unit for future recall and editing if necessary.

Another thing that I did in order to make the data more uniform is include two pre-populated combo boxes in the user forms. One can be seen expanded in screenshot **E.** and contains the units the flooring store sells its products in. The other is part of the phone number input and contains the area codes "801" and "435" because practically all of the business this store does is local and these are really the only area codes they deal with. The remaining seven digits of the phone number can be entered with or without a hyphen, space, or really any other character, and any nonnumeric characters will be removed and when the phone number is entered, it will be formatted as a phone number with parentheses and a hyphen.

Two more small things that I did to improve uniformity deal with the date and with new records for existing customers. To improve the accuracy and use of the date field, I made it so that every time a new record is being added, the current date shows up in the field. For entering new records for existing customers, the frmFind form appears with the customer configuration rather than the record configuration, and the customer information can be entered as shown in screenshot **C.** Once the correct customer record has been found as shown in screenshot **D.** the user can click the "New Record for Customer" button on the form and the "Add New Record"

form opens prepopulated with the customer's name, address, city, and phone number in addition to the current date. In order to facilitate ongoing use of these forms and this interface, I also ran several different instances of "find and replace" to remove or replace unwanted spaces, hyphens and other characters, as well as abbreviations and such that differed from those used by this new system; I also visually scanned the existing records several times to ensure these were effective and to optimize the existing data in the spreadsheet so that this new interface will be as helpful for the older records as it will be for inputting and managing new ones.

Challenges:

In undertaking and completing this project I tried to make this interface as robust as I possibly could. In order to do that, I tried to foresee all of the possible situations that could cause either a system error, or simply undesirable or incomplete output. Some of these were quite challenging, one in particular that seems very simple but was somewhat difficult was that of trying to make sure the name showed up everywhere it should and in correct format. One of the factors preventing this I addressed by the requirement of first and last name as I discussed previously.

Probably the best learning experience for me was configuring the two forms to work as four, though. I had to go through all the situations where the forms could come up and make sure I had made all of the necessary changes to make only the right buttons and labels visible with the correct captions, and then I had to test many times whether or not everything worked as expected, but in the end It all came together very nicely.

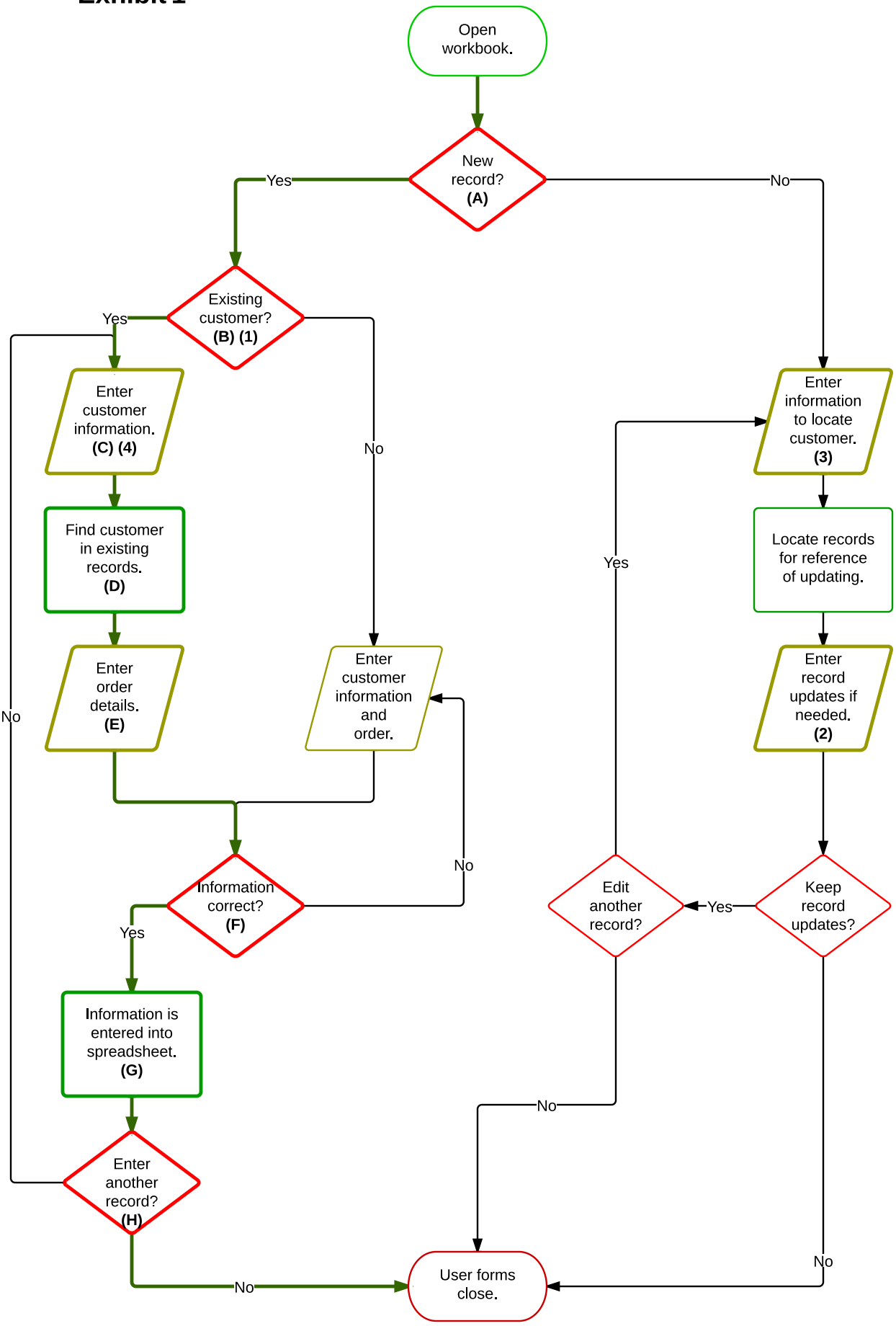
Once all the forms and command buttons were working correctly, I had to experiment and do some research into how to program the Excel ribbon so that the buttons I wanted would show up where I wanted them, and so that I could program them to do what I needed them to do, and this was a very new experience to me.

Assistance. I referenced previous class examples and my own previous assignments a lot, as well as looking up some things on the internet. I did not however seek help from any other individuals and no other person helped me with any of the code for the project.

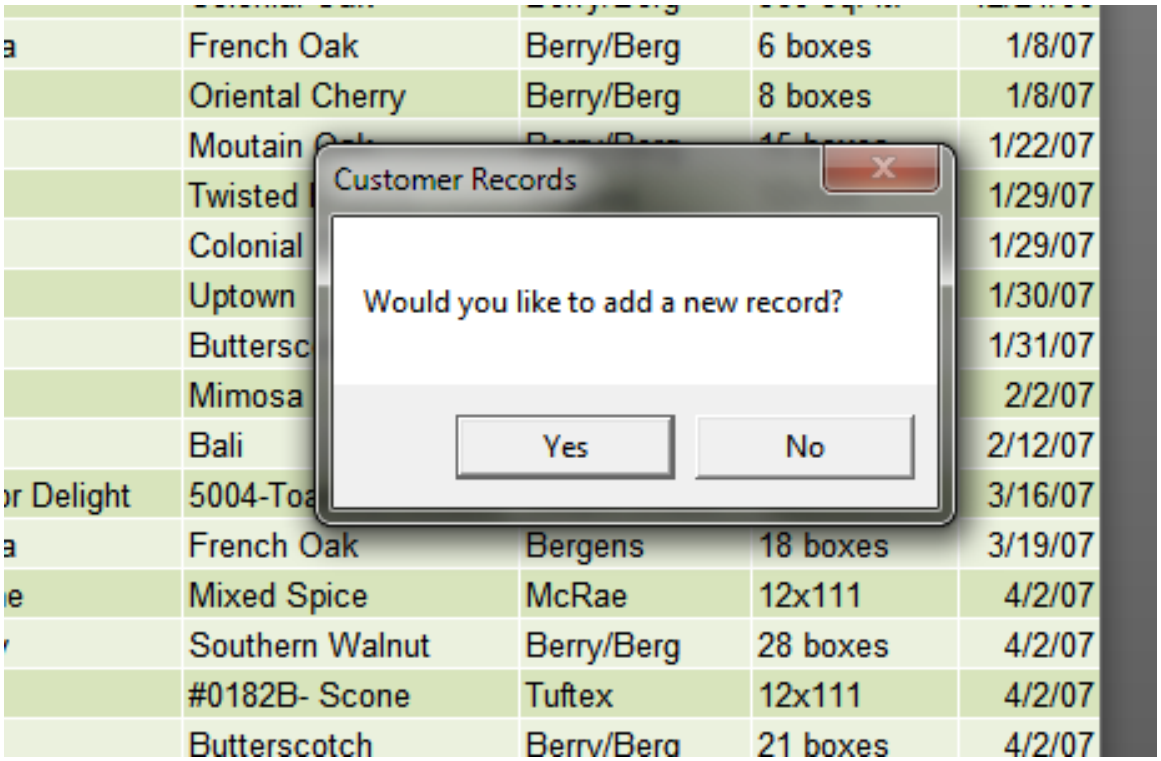
Conclusion:

I am very pleased with the end result of this project and I think it will help out the people at Custom Carpets & Vinyl a great deal. I really enjoyed going through the process and I felt like even though parts of it seemed similar to things I had done before, I had to put many different concepts together and it really stretched me to use my skills to the fullest and learn new things. Perhaps the best part, though, is that I really started to see how I can take my skills beyond the walls of the classroom and use VBA in my own problems and applications.

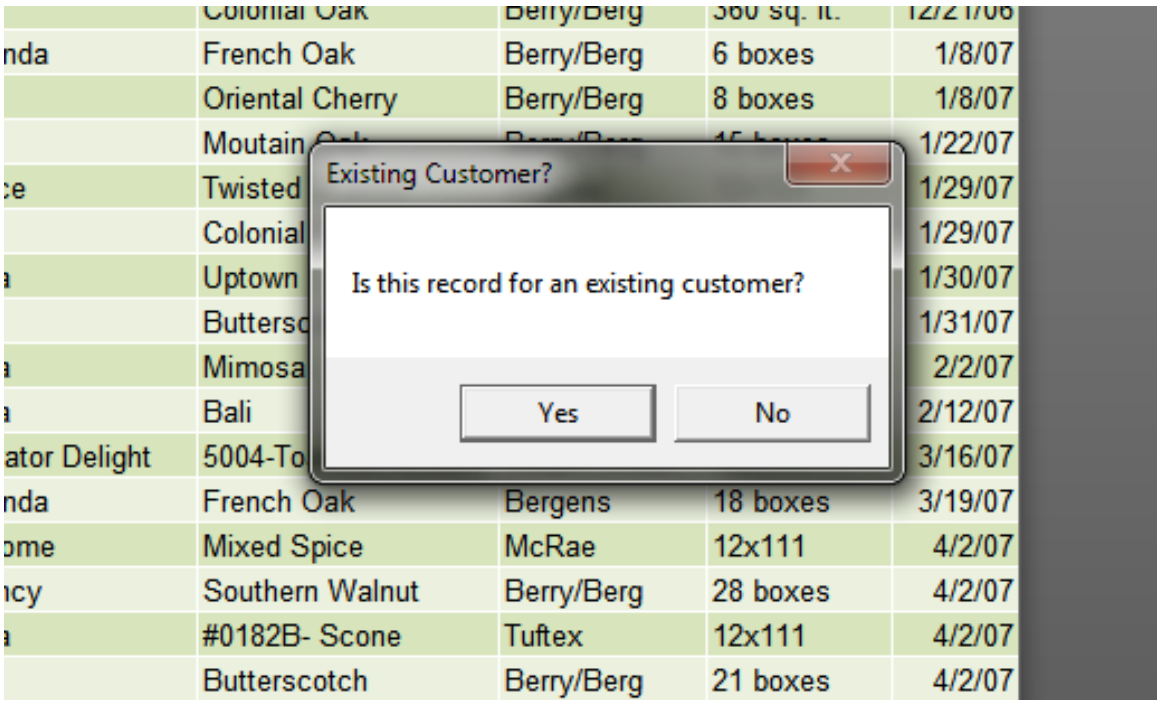
Exhibit 1


Open workbook.
New record? (A)
Yes
No
Existing customer? (B) (1)
Yes
No
Enter customer information. (C) (4)
Find customer in existing records. (D)
Enter order details. (E)
No
Enter customer information and order.
Information correct? (F)
No
Yes
Information is entered into spreadsheet. (G)
Enter another record? (H)
No
Enter information to locate customer. (3)
Locate records for reference of updating.
Enter record updates if needed. (2)
Keep record updates?
Yes
Edit another record?
Yes
No
No
User forms close.

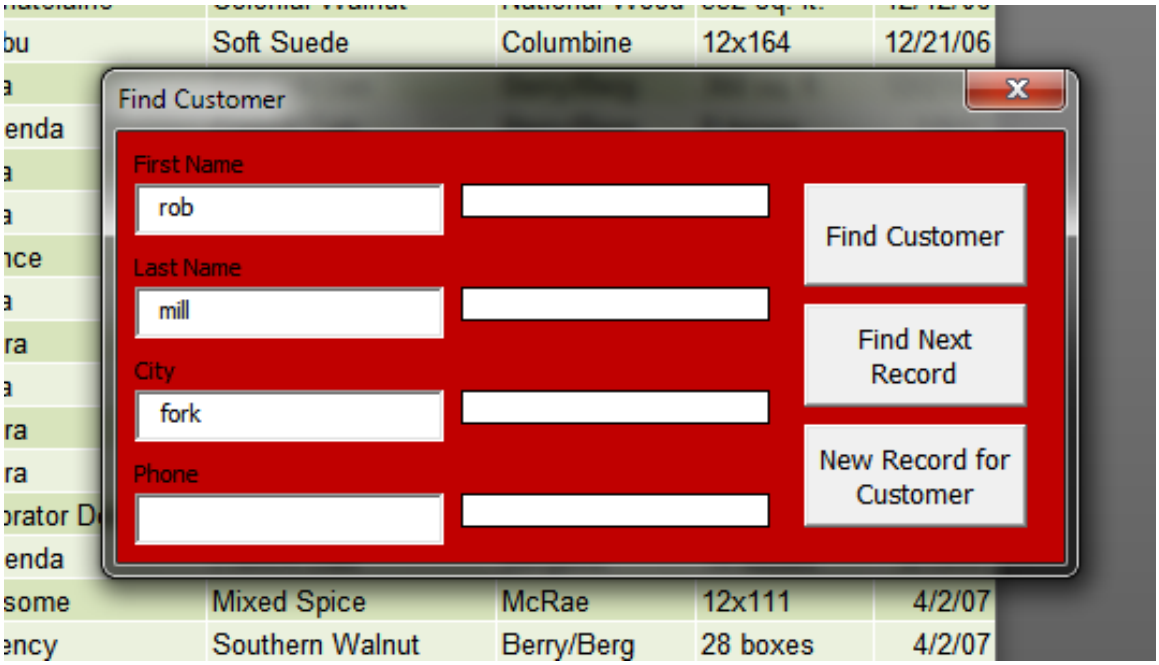
A.


French Oak Berry/Berg 6 boxes 1/8/07
Oriental Cherry Berry/Berg 8 boxes 1/8/07
1/22/07
1/29/07
1/29/07
1/30/07
1/31/07
2/2/07
2/12/07
3/16/07
French Oak Bergens 18 boxes 3/19/07
Mixed Spice McRae 12x111 4/2/07
Southern Walnut Berry/Berg 28 boxes 4/2/07
#0182B- Scone Tuftex 12x111 4/2/07
Butterscotch Berry/Berg 21 boxes 4/2/07
Customer Records
Would you like to add a new record?
Yes
No

B.


French Oak Berry/Berg 6 boxes 1/8/07
Oriental Cherry Berry/Berg 8 boxes 1/8/07
1/22/07
1/29/07
1/29/07
1/30/07
1/31/07
2/2/07
2/12/07
3/16/07
French Oak Bergens 18 boxes 3/19/07
Mixed Spice McRae 12x111 4/2/07
Southern Walnut Berry/Berg 28 boxes 4/2/07
#0182B- Scone Tuftex 12x111 4/2/07
Butterscotch Berry/Berg 21 boxes 4/2/07
Existing Customer?
Is this record for an existing customer?
Yes
No

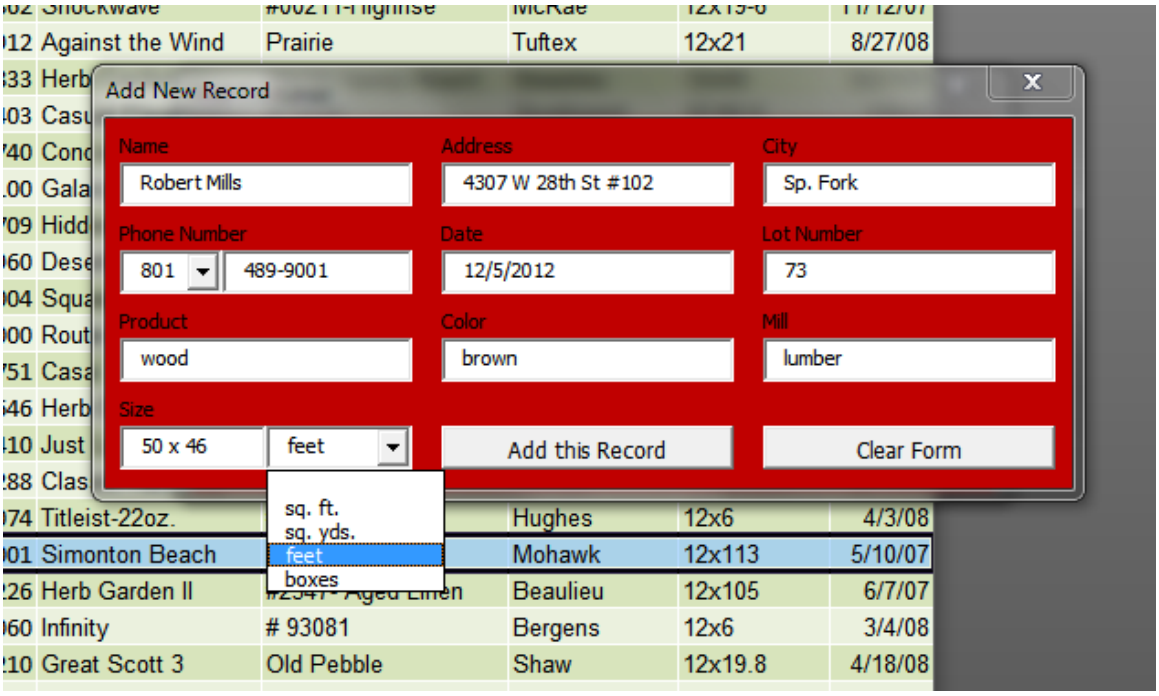
C.


Soft Suede
Columbine
12x164
12/21/06
Find Customer
First Name
rob
Last Name
mill
City
fork
Phone
Find Customer
Find Next Record
New Record for Customer
Mixed Spice
McRae
12x111
4/2/07
Southern Walnut
Berry/Berg
28 boxes
4/2/07

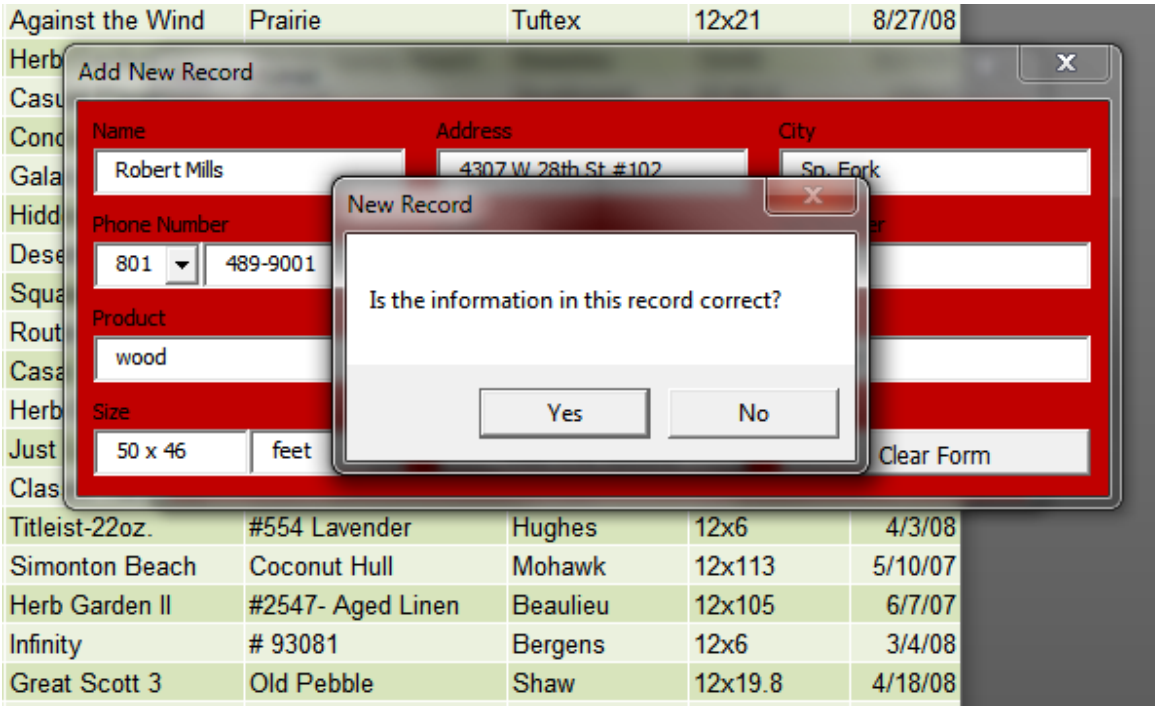
D.


Find Customer
First Name
rob
Robert
Last Name
mill
Mills
City
fork
Sp. Fork
Phone
(801)489-9001
Find Customer
Find Next Record
New Record for Customer

E.


Add New Record
Name
Robert Mills
Address
4307 W 28th St #102
City
Sp. Fork
Phone Number
801
489-9001
Date
12/5/2012
Lot Number
73
Product
wood
Color
brown
Mill
lumber
Size
50 x 46
feet
sq. ft.
sq. yds.
feet
boxes
Add this Record
Clear Form
012 Against the Wind Prairie Tuftex 12x21 8/27/08
074 Titleist-22oz. Hughes 12x6 4/3/08
001 Simonton Beach Mohawk 12x113 5/10/07
226 Herb Garden II Beaulieu 12x105 6/7/07
060 Infinity # 93081 Bergens 12x6 3/4/08
210 Great Scott 3 Old Pebble Shaw 12x19.8 4/18/08

F.


Add New Record
Name
Robert Mills
Address
Sp. Fork
Phone Number
801
489-9001
Product
wood
Size
50 x 46
feet
Clear Form
New Record
Is the information in this record correct?
Yes
No
Against the Wind Prairie Tuftex 12x21 8/27/08
Titleist-22oz. #554 Lavender Hughes 12x6 4/3/08
Simonton Beach Coconut Hull Mohawk 12x113 5/10/07
Herb Garden II #2547- Aged Linen Beaulieu 12x105 6/7/07
Infinity # 93081 Bergens 12x6 3/4/08
Great Scott 3 Old Pebble Shaw 12x19.8 4/18/08

G.

Sarbin	Theodore		111 S Dr Ml King Jr St	Springville	(801) 592-3912	Against the Wind	Prairie	Tuftex	12x21	8/27/08
Cadier	Fredrick		55 Rock Hollow Ln	Springville	(801) 489-2833	Herb				
Fischer	Lynn		84 Belmore Dr	Springville	(801) 367-8403	Casu				
Williamson	Roberta		4922 Brompton Dr #F	Springville	(801) 489-2740	Conc				
Shu	Wesley		928 Walnutcrest Dr	Springville	(801) 491-8100	Gala				
Abraham	Bryan		15530 Ella Blvd	Mapleton	(801) 489-7709	Hidd				
Schiller	Shu		304 Ohio Ct	Elk Ridge	(801) 489-7960	Dese				
Walter	Edgar		211 Berkshire Dr	Mt. Pleasant	(801) 722-6004	Squa				
Capra	Eugenio		520 E 20th St	Springville	(801) 798-1000	Rout				
Halawi	Leila		45 Michael Ln	Springville	(801) 830-1751	Casa				
Hankins	Tim		132 Cedar Hill Rd	Schofield	(80) 183-0646	Herb				
Haynes	Herman		1333 Bush St	Mona	(801) 491-9410	Just				
Lycett	Mark		3542 Lehigh Cir	Mona	(801) 369-9288	Clas				
Sein	Maung		9 Robin Cir	Springville	(801) 369-3074	Titleist-22oz.	#554 Lavender	Hughes	12x6	4/3/08
Mills	Robert	107	4307 W 28th St #102	Sp. Fork	(801) 489-9001	Simonton Beach	Coconut Hull	Mohawk	12x113	5/10/07
Wang	Xinwei		74602 Strawflower Cir	Sp. Fork	(801) 489-9226	Herb Garden II	#2547- Aged Linen	Beaulieu	12x105	6/7/07
Grabowski	Mariusz		4145 S Princeton Ave	Springville	(801) 489-6060	Infinity	# 93081	Bergens	12x6	3/4/08
George	Babu		2436 Thames Valley Way	Mapleton	(801) 489-4210	Great Scott 3	Old Pebble	Shaw	12x19.8	4/18/08
Hartnell-Young	Elizabeth		226 Fairview Dr	Mapleton	(801) 361-6017	Anchors Away	Pinewood	Shaw	12x19.1	4/18/08
Hansen	Sean		30350 Old Stream St	Springville	(801) 376-4807	Serenade	#1496-Sandalwood	Southwind	12x68	4/28/08
Mills	Robert	73	4307 W 28th St #102	Sp. fork	(801) 489-9001	Wood	Brown	Lumber	50x46 feet	12/5/12

H.

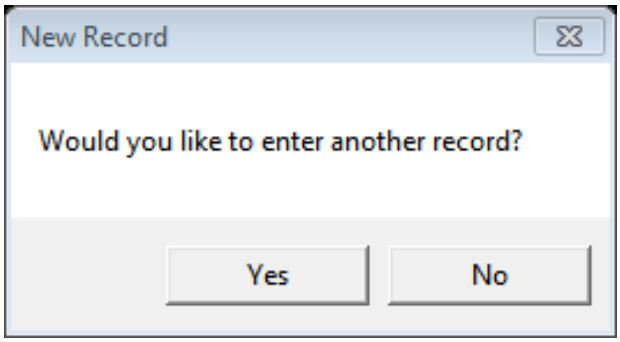
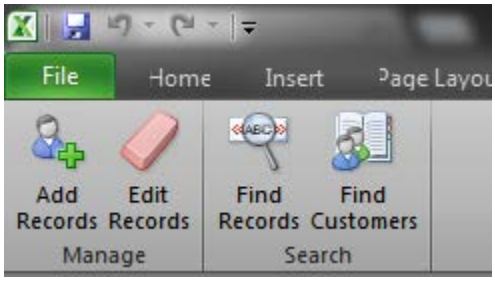
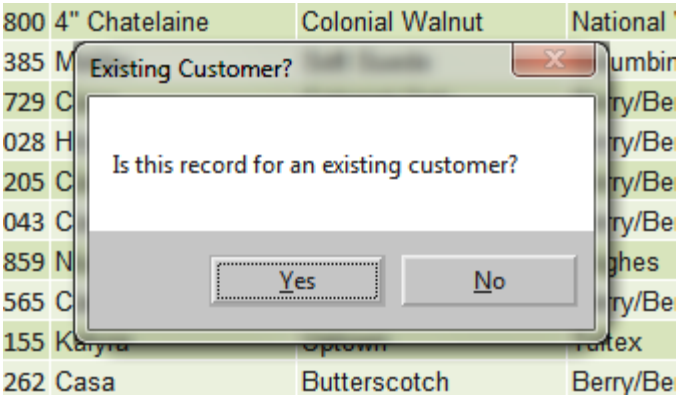


Exhibit 2



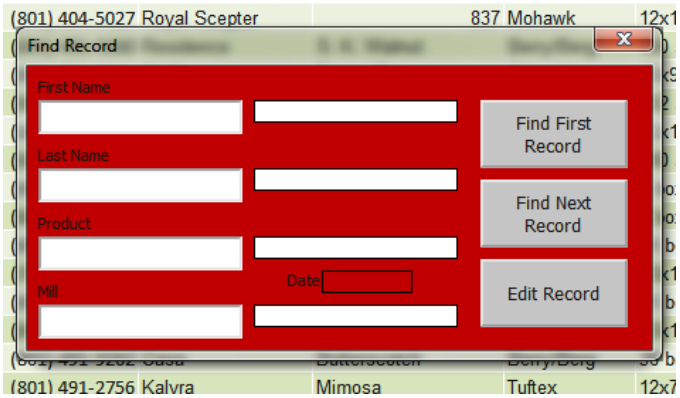
1 2 3 4

1.



2.

3.



4.