

# IS520 Final Project

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## **Executive Summary**

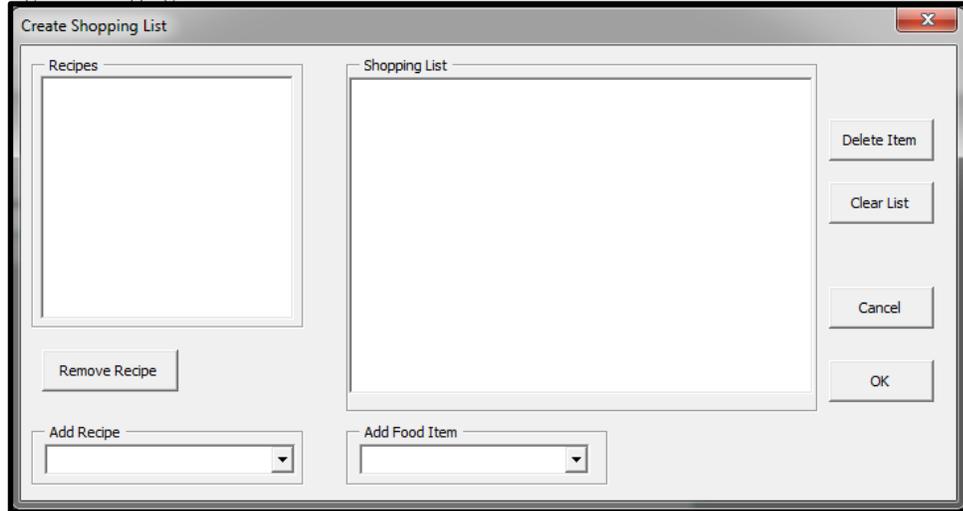
For this project, I chose to create a grocery shopping list generator for my wife. My wife is a registered dietician who focused in food service management. While in school she managed the Pendulum Court Café in the Eyring Science Building on the BYU campus. As the manager, she used software that could generate a grocery list based on the recipes that the Café would be using for the next week or so. I decided I wanted to replicate, on a smaller scale, the software that she used in her work using Microsoft Excel and VBA. This grocery shopping list generator can then be used in our home as we plan our meals and buy the necessary ingredients, while trying to stay within a budget.

With this shopping list generator (a user form), the user can select multiple recipes from a list box as well as individual food items from the database to create a shopping list of the major ingredients needed to make those recipes. Upon selecting “OK”, each ingredient that has been selected with the user form appears in the Excel spreadsheet, along with its price per unit. The list is then organized by food category and the total estimated price for the shopping list appears at the bottom of the list. Additionally, the user can enter new recipes and new food items, along with their prices, into the database with user forms. The shopping list generator then draws upon these updated databased to create a shopping list.

## Implementation

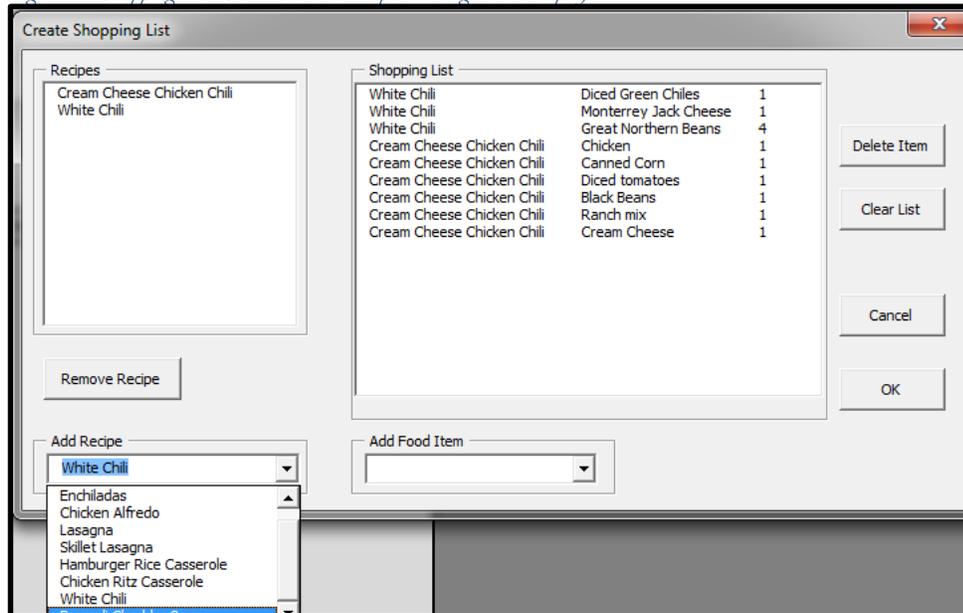
The first step in making this shopping list generator was designing a user form that would be easy and logical to use (see *Figure 1*). The user form contains a dropdown list of all the recipes in the database and another dropdown list of all the individual food items in the database. The shopping list user form can be selected from the “Shopping List” tab in the main ribbon.

*Figure 1 – Shopping List User Form*



As each recipe is chosen from the recipe list, VBA code finds that recipe and its ingredients (including quantities) in the database and displays them in the shopping list box (see *Figure 2*). If the user changes their mind, they can delete a recipe or an individual item from the shopping list, or clear the entire list.

*Figure 2 – Shopping List User Form with recipes and ingredients displayed*



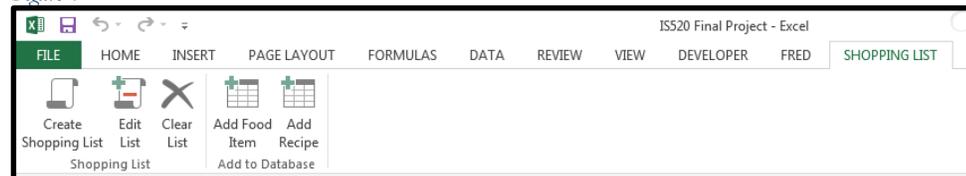
Once the user is satisfied that the shopping list is accurate, they can select “OK” and the shopping list is then transferred from the user form to the Excel spreadsheet shopping list box (see *Figure 3*). While doing so, VBA inserts formulas into the cells to find each ingredient’s category and price from the database and then totals the prices for the whole list. Not all ingredients in the shopping list will be in the database, so if Excel cannot find the category and price, it will leave those cells blank and that item will not be included in the total price at the bottom. Currently, the only food items in the database are ones that I have bought in the last month and recorded their price.

*Figure 3 – Shopping List box in Excel spreadsheet*

Shopping List				
Recipe	Item	Category	Quantity	Price
White Chili	Diced Green Chiles		1	\$ -
White Chili	Monterrey Jack Cheese		1	\$ -
White Chili	Great Northern Beans		4	\$ -
Cream Cheese Chicken Chili	Chicken		1	\$ -
Cream Cheese Chicken Chili	Canned Corn		1	\$ -
Cream Cheese Chicken Chili	Diced tomatoes		1	\$ -
Cream Cheese Chicken Chili	Black Beans	Canned	1	\$ 0.75
Cream Cheese Chicken Chili	Ranch mix	Condiments	1	\$ 0.50
Cream Cheese Chicken Chili	Cream Cheese	Dairy	1	\$ 1.49
<b>Total (with tax)</b>				<b>\$2.92</b>

If the user wants to erase the list and start over, they can select the “Clear List” button in the “Shopping List” tab in the ribbon and then select “Edit Shopping List” to change what they need.

*Figure 4*



The next step in creating this shopping list generator was to create user forms to insert new recipes and new food items into the database. The new recipe user form allows the user to insert a new recipe name and each of the major ingredients in that recipe and its quantity. It is important to note that the quantity is not based on the actual measurement that goes into the recipe (1 cup, 1 tsp, etc.), but rather a whole unit of food sold by the grocery store. It would not be helpful to generate a shopping list based on a single measurement in the recipe, for example, 1 cup of flour – the user cannot go to the store and buy 1 cup of flour, but must buy a whole bag of flour. Thus, quantities are usually entered as 1 (for one unit). If the recipe

requires more than 1 unit of the item, then the quantity entered into the database should reflect that. The new recipes immediately becomes available in the shopping list user form.

Figure 5 – Add a Recipe User Form

Ingredient	Quantity
Flour	1
Mozzarella Cheese	1
Pizza Sauce	1
Pepperoni	1

The new food item user form allows the user to enter in a new food item, its category, and its price into the database. If the item already exists in the database, the new price entered into the user form will replace the old price. The new food item immediately becomes available in the shopping list user form.

Figure 6 – Add a Food Item User Form

Food Item	Category	Price
Pepperoni	Meat	2

## **What I Learned**

In the many hours that I spent working on this project, I have learned a lot about VBA. In particular, I have learned how to search for and find problems and how to get help from others, the internet, and recorded macros in Excel.

As I designed my preliminary shopping list user form and added the preliminary code, I ran into many problems. One by one I was able to address most of the problems through trial and error and learning about new components of the user form. For example, I did not know how I could display the recipe, each ingredient and each quantity in one list box. But as I researched about list boxes, I found that I could add columns to the list box and assign items to different columns. With the help of internet forums, I was able to learn how to assign items to the same row, but different columns.

For the major problems in my code, I had to get help from Nathan Dudley (the TA for IS520), the internet, and step through the sub one step at a time to identify the problem. For example, one major problem I ran into was getting the VBA code to add new recipe ingredients to the shopping list list box as a new recipe was added to the recipe list box. With my original code, when I added a new recipe, the ingredients from the first recipe in the recipe list box would be added again to the shopping list instead of the ingredients for the new recipe. Upon getting help from Nathan, lots of research on the internet, and many times of stepping through my code, I came to realize that one of my variables was inside of a loop when it should have been outside that loop. Once I made the change, the code worked perfectly.

I also used the help of recording macros to learn about new ways of writing code. For example, I did not know how to write code for a lot of the formatting of the shopping list (borders, colors, and column widths). By using the macro recording function in Excel, I was able to learn how to do this type of formatting in VBA. The formatting was the only pieces of code that I did not write myself (I copied the code from the macro with the VBA formatting).

Because of the amount of time I spent on this project, I was able to include all the important aspects of my original plan for this shopping list generator. There are some small details that I will add later as my wife begins to use it and makes suggestions for how it could be changed to be more useful. But because of the hard work and the hours I put into this project, I was able to accomplish all the important steps in making this shopping list generator work.

## **Conclusion**

Overall, this project has helped me learn a lot about how to use VBA to automate a task to make it easier. I learned how to plan out a project, write VBA code, learn about new code and concepts, and how to explain it to others. I hope that my solution is useful to my family, and to any others that would want to use it, for planning meals and a subsequent shopping list while trying to stay within a budget.