MY HEALTH-TRACKER PROGRAM

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Executive Summary

Eating healthy has been a struggle for many people nationwide. We always think we should be eating healthier, and we make New Year's resolutions to do so, but usually no changes are actually made to our diets. We at Health-Tracker are committed to helping America improve their diet through our eating programs.

Health-Tracker is a non-profit organization that offers programs including meal plans, health evaluation, personal trainers, and much more in order to help people improve their health. In our work to help people improve their health we have found that the most important step to any successful diet is to track the foods you eat. The tracking process helps us see clearly what we eat, how much we eat, trends in diets, and the nutritional value of what we eat. This is essential to identify how your diet is lacking, and to keep you accountable to the goals you have set. With a clear record of what you eat, you can't "forget" about the cake you ate, and you can clearly see just how few vegetables you are probably eating.

The Health-Tracker food tracking program will help you to quickly and easily create a log of the foods you eat and their nutritional value. To begin using our program you input your profile including your height, weight, age, and gender. The system will then pull your nutritional needs from the internet to give you an estimate of what you need in your diet including calories, amount of fat, amount of carbs, amount of protein, vitamin a, vitamin c, vitamin d, calcium, iron, and fiber. Next, foods are entered to the Food Log sheet of the program. On the food log you open an internet browser to get URLs for the foods you ate so the program can get the nutritional information from the internet and input it to the log. As you enter the foods you eat into the food log our program will track this nutrition info to give you continuous updates on how you are doing to meet your nutrition goals. You can see all-time, weekly, and monthly reports to show your results over time and to help identify trends.

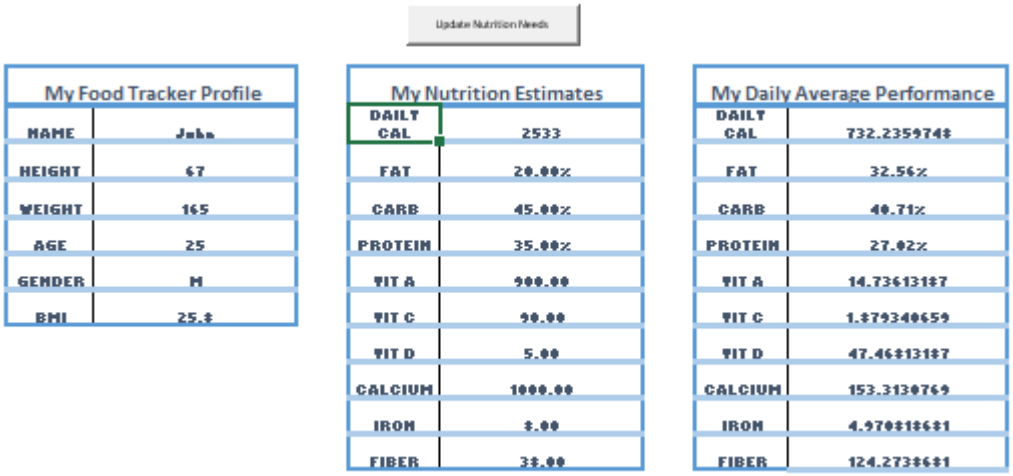
By tracking the foods you eat, you will be able to get a clear picture of your current nutrition needs. By taking a little time to input the foods you eat you will get a useful report to show which nutrients you are lacking, how many calories you are eating in a day, and how you can improve. We at Health-Tracker hope this information will be useful to help bring in a healthier, happier America.

Implementation

The Health-Tracker system has 4 main components to track nutrition and display it for the user.

My Profile

This sheet is where the User inputs their personal information to get their nutritional estimates, and to see an all-time report of their nutrition averages.



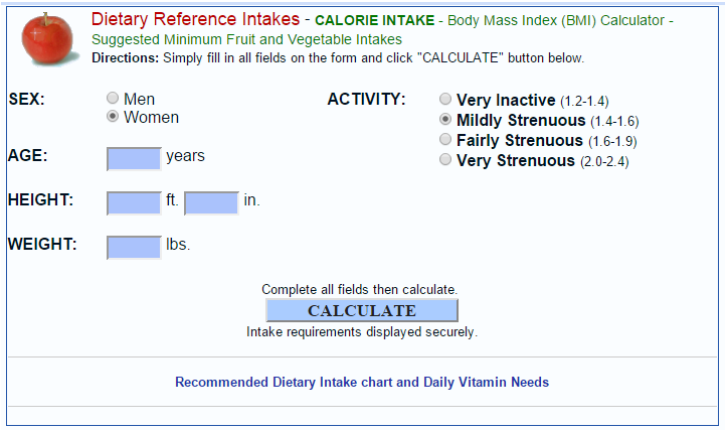
Update Nutrition Needs

My Food Tracker Profile	
NAME	Jake
HEIGHT	67
WEIGHT	165
AGE	25
GENDER	M
BMI	25.8

My Nutrition Estimates	
DAILY CAL	2533
FAT	20.00%
CARB	45.00%
PROTEIN	35.00%
VIT A	900.00
VIT C	90.00
VIT D	5.00
CALCIUM	1000.00
IRON	8.00
FIBER	38.00

My Daily Average Performance	
DAILY CAL	732.2359748
FAT	32.56%
CARB	40.71%
PROTEIN	27.02%
VIT A	14.73613187
VIT C	1.879340659
VIT D	47.46813187
CALCIUM	153.3130769
IRON	4.970818681
FIBER	124.2738681

To get the nutrition estimates the page has a button linked to the sub getNutritionInfo that is located in the ProfileInfo module. This sub controls IE to get nutritional information from the internet at the site https://www.planetpace.com/?dietary-intakes. The page is shown below.



Dietary Reference Intakes - **CALORIE INTAKE** - Body Mass Index (BMI) Calculator - Suggested Minimum Fruit and Vegetable Intakes

Directions: Simply fill in all fields on the form and click "CALCULATE" button below.

SEX: Men / Women

ACTIVITY: **Very Inactive** (1.2-1.4) / **Mildly Strenuous** (1.4-1.6) / **Fairly Strenuous** (1.6-1.9) / **Very Strenuous** (2.0-2.4)

AGE: years

HEIGHT: ft. in.

WEIGHT: lbs.

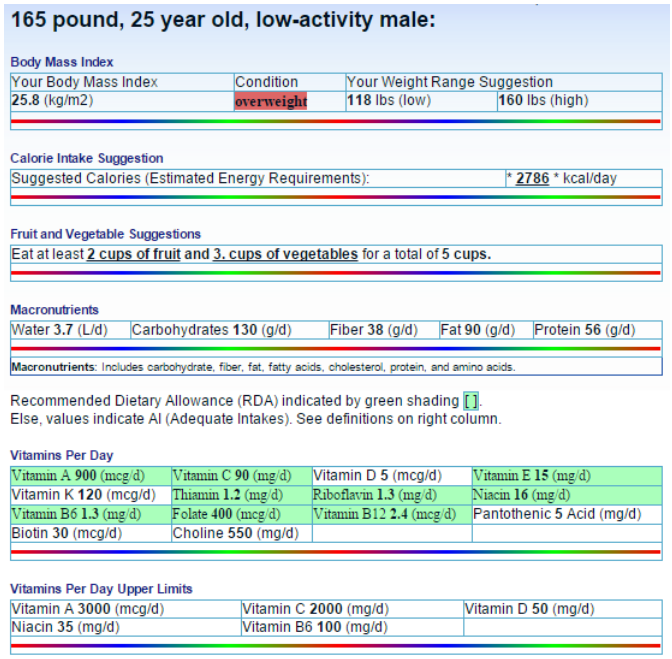
Complete all fields then calculate.

CALCULATE

Intake requirements displayed securely.

Recommended Dietary Intake chart and Daily Vitamin Needs

VBA gets the information input to the profile to fill out the form. The form contains text fields, and radio buttons. My VBA code will fill out the form and submit, then get the nutritional estimate data from the resulting page. The result page is show below.



165 pound, 25 year old, low-activity male:

Body Mass Index

Your Body Mass Index	Condition	Your Weight Range Suggestion	
25.8 (kg/m2)	**overweight**	**118** lbs (low)	**160** lbs (high)

Calorie Intake Suggestion

Suggested Calories (Estimated Energy Requirements):	* **2786** * kcal/day

Fruit and Vegetable Suggestions

Eat at least **2 cups of fruit** and **3. cups of vegetables** for a total of **5 cups.**

Macronutrients

Water **3.7** (L/d)	Carbohydrates **130** (g/d)	Fiber **38** (g/d)	Fat **90** (g/d)	Protein **56** (g/d)

Macronutrients: Includes carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids.

Recommended Dietary Allowance (RDA) indicated by green shading [ ].
Else, values indicate AI (Adequate Intakes). See definitions on right column.

Vitamins Per Day

Vitamin A **900** (mcg/d)	Vitamin C **90** (mg/d)	Vitamin D **5** (mcg/d)	Vitamin E **15** (mg/d)
Vitamin K **120** (mcg/d)	Thiamin **1.2** (mg/d)	Riboflavin **1.3** (mg/d)	Niacin **16** (mg/d)
Vitamin B6 **1.3** (mg/d)	Folate **400** (mcg/d)	Vitamin B12 **2.4** (mcg/d)	Pantothenic **5** Acid (mg/d)
Biotin **30** (mcg/d)	Choline **550** (mg/d)		

Vitamins Per Day Upper Limits

Vitamin A **3000** (mcg/d)	Vitamin C **2000** (mg/d)	Vitamin D **50** (mg/d)
Niacin **35** (mg/d)	Vitamin B6 **100** (mg/d)	

The Average performance page gets averages from the Food Log using excel formulas.

Food Log

The food log is where the user inputs their meal information so my program can get its nutrition values.

The food log tracks several values: Date of meal, which meal, food name, amount eaten in grams, caloric content, fat, carbs, protein, vitamin a, vitamin c, vitamin d, calcium, iron, and fiber. These were chosen because they are the nutrients identified by the FDA as important and required to be on labels.

The majority of the code for this sheet is on the foodForm userForm. This code:

- creates the form used to enter nutrition data
- runs background web queries through IE automation to get site info
- cleans data from the web to be displayed on the user form and to be entered in the log

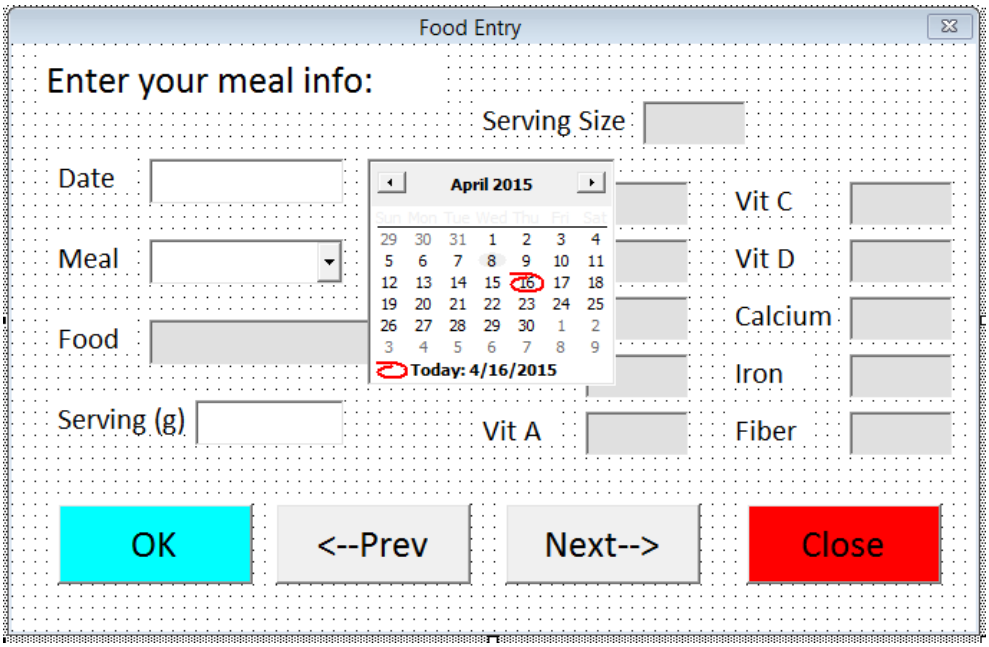
The sheet has 2 buttons for users

- One opens IE to the website I have chosen to gather nutrition info from: http://www.nutritionvalue.org so they can get the URL. This button makes use of sub openNutritionSite from the openFoodSite Module.

- One to look up food by URL in order to get nutritional information from the web and display it in the user form. This makes use of the code located in the foodForm userform.

The foodForm has all fields that are tracked on the food log. Most of these are entered automatically by the program from the selected URL. The fields entered automatically from the URL are not editable by the user, so they are grey to distinguish them.

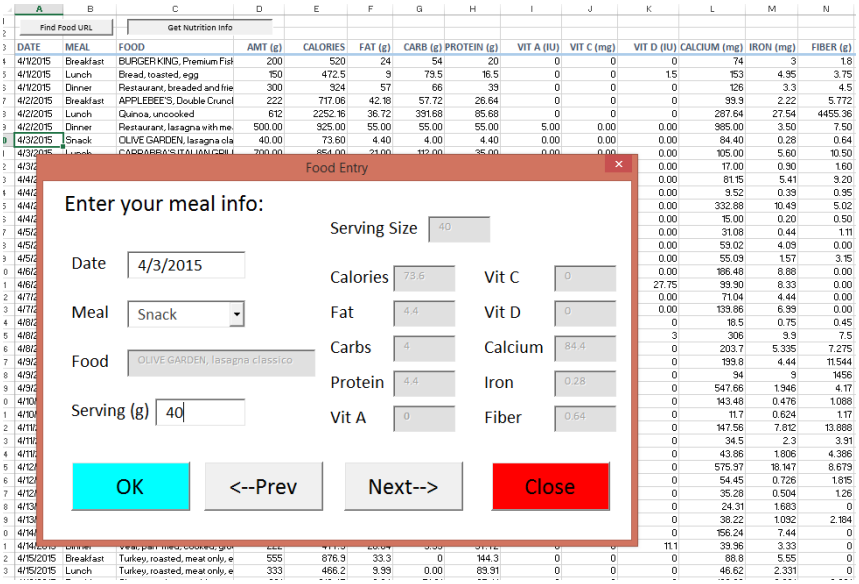
The User must select the date, the mean, and enter the amount eaten. The data entry is made easy with a calendar tool that appears when the date field is selected, and the meal entry is a dropdown list. The form is shown below.



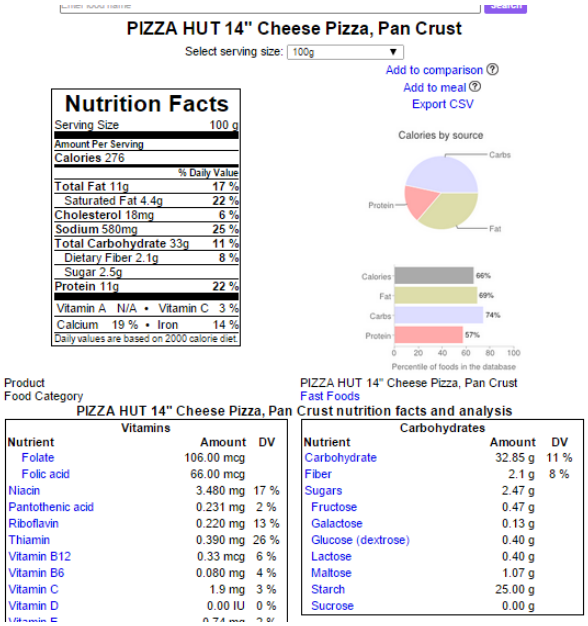
Form buttons:

- OK button: will enter the form info into the log
- Navigation Buttons: Next → to move forward, or they can select ←Prev to correct a previous entry. The navigation buttons will get the next/previous URL and refresh the form with that food's information. They will also get any existing information on the Date, Meal, and Serving if available.
- Close button: will close the form without saving

A screenshot of the Food Log sheet with data is shown below.



A screenshot of the website that the nutrition information is gather from is shown below.



Weekly Log

The weekly log sheet gathers information from the food log by its week and logs averages of the nutritional value of foods eaten in that week. The sheet also displays the user goals along with the results from the weeks and a comparison to show how close they were to reaching their goals. If they were under the goal the field is marked red. If they exceeded it, the field is marked green.

This sheet uses code in the calculatePerformance module and the makeGraphs module that are executed through use of the 2 buttons:

- Update Averages: uses calculatePerformance code to get averages based on the week by selecting food log entries that are in the same week, summing them, and dividing by the number of days entered for that week. Each week calculated is entered into the sheet. Overall averages in the top are updated from new data.

- Generate Graph: uses makeGraphs to create a stacked column graph showing user results and their goals. Due to the large differences in scale between the nutrition values this chart was chosen as the best way to represent the data easily. Ideally the graph will be a 50/50 split meaning their results and their goals ended up equal.

A screenshot of the Weekly Log sheet is shown below.

Weekly Averages Per Day | Update Averages | Generate Graph

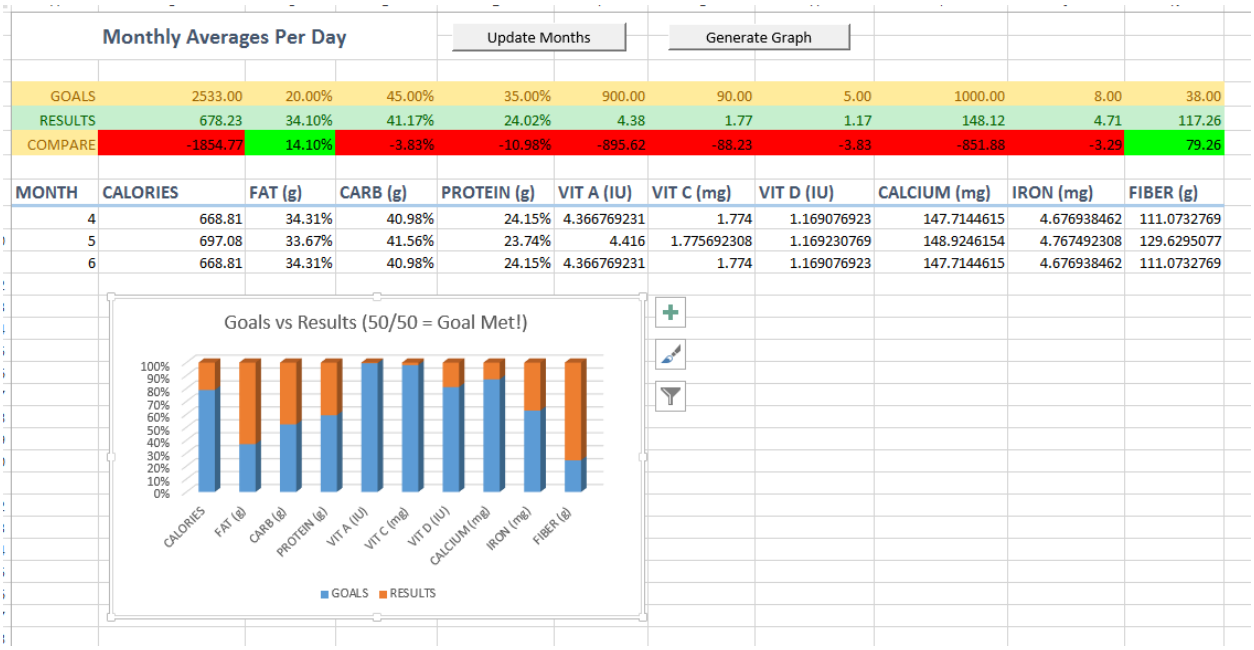
GOALS	2533.00	20.00%	45.00%	35.00%	900.00	90.00	5.00	1000.00	8.00	38.00
RESULTS	1349.54	34.07%	43.59%	21.20%	8.72	3.53	2.33	294.72	9.37	233.32
COMPARE	-1183.46	14.07%	-1.41%	-13.80%	-891.28	-86.47	-2.67	-705.28	1.37	195.32

WEEK	CALORIES	FAT (g)	CARB (g)	PROTEIN (g)	VIT A (IU)	VIT C (mg)	VIT D (IU)	CALCIUM (mg)	IRON (mg)	FIBER (g)
14	1259.04	34.93%	46.49%	17.24%	1.285714286	0	0.214285714	338.6414286	9.682857143	643.8695714
15	1818.76	35.45%	27.53%	34.52%	2.79	4.497142857	4.392857143	341.89	11.30442857	216.5198571
16	2033.37	28.79%	45.92%	27.26%	16.99714286	10.71	1.585714286	363.3857143	17.38042857	21.95685714
17	1004.51	43.07%	47.45%	8.45%	19.33285714	0.98	3.805714286	272.5742857	4.489571429	148.0055714
18	939.25	35.17%	48.03%	0.164770515	0.857142857	0.285714286	1.071428571	301.7928571	7.074285714	798.1402857
19	2020.09	38.03%	26.92%	0.332032827	3.504285714	4.511428571	4.392857143	381.3271429	13.275	231.5332857
20	1654.55	28.56%	46.08%	0.297744922	14.57	4.245714286	1.585714286	314.16	13.42242857	11.97071429
21	1778.10	31.96%	50.42%	0.12080291	20.50285714	7.445714286	3.807142857	371.8771429	10.19785714	145.5868571
22	175.57	38.81%	48.40%	0.113913751	1.714285714	0.285714286	0.857142857	68.85714286	0.871428571	17.51428571
23	1767.72	36.25%	35.60%	0.260646096	3.678571429	4.497142857	4.178571429	400.2942857	13.01271429	644.4778571
24	1706.20	36.92%	33.71%	0.277746008	4.691428571	3.12	0.428571429	384.27	11.13914286	217.9027143
25	2275.93	31.21%	48.65%	21.86%	28.68857143	7.59	1.585714286	364.4414286	16.63328571	148.1244286
26	407.53	33.58%	50.07%	14.51%	3.49	1.265714286	3.805714286	191.9142857	2.300714286	20.28971429
27	53.00	24.26%	54.99%	16.17%	0	0	0.857142857	30.71428571	0.342857143	0.6

Monthly Log

Same as the weekly log. The only difference is that food log entries are selected by month, instead of week. Has the same buttons on it, and uses the same modules calculatePerformance and makeGraphs but uses the subs for months instead of weeks.

A screenshot of the Monthly Log sheet along with a graph is shown below.



GOALS	2533.00	20.00%	45.00%	35.00%	900.00	90.00	5.00	1000.00	8.00	38.00
RESULTS	678.23	34.10%	41.17%	24.02%	4.38	1.77	1.17	148.12	4.71	117.26
COMPARE	-1854.77	14.10%	-3.83%	-10.98%	-895.62	-88.23	-3.83	-851.88	-3.29	79.26

MONTH	CALORIES	FAT (g)	CARB (g)	PROTEIN (g)	VIT A (IU)	VIT C (mg)	VIT D (IU)	CALCIUM (mg)	IRON (mg)	FIBER (g)
4	668.81	34.31%	40.98%	24.15%	4.366769231	1.774	1.169076923	147.7144615	4.676938462	111.0732769
5	697.08	33.67%	41.56%	23.74%	4.416	1.775692308	1.169230769	148.9246154	4.767492308	129.6295077
6	668.81	34.31%	40.98%	24.15%	4.366769231	1.774	1.169076923	147.7144615	4.676938462	111.0732769

Learning and Difficulties

Some of the difficulties I had with this project included: getting VBA IE automation to work properly for complex form pages, finding reliable and comprehensive sources of information, and creating easy to use controls for users.

One issue I encountered early on was the difficulty of handling user input to find nutritional value for foods. For example, if I search for a hamburger there are far too many variables including: restaurant, condiments added, patty size, and more for my program to find the correct food to log. To work around this issue I instead let the user make use of the already-existing search tools on the website I chose to gather nutritional information from and my program uses the URL they get from it.

I tried to improve this method by building IE into my program so the user can search inside the program and it will automatically get the URL for them from the page they choose instead of having them copy and paste. This may be possible, but I was unable to find any IE automation methods to perform "on close" type events to get a URL. I temporarily had code that ran constantly in the background to monitor the current IE URL but this caused noticeable lag in my program and I chose to remove it. It also did not address the issue that IE in VBA is not designed for this type of use, and I was unable to find methods to keep the page open while a user searches. I worked around this problem by implementing a timer before the "end sub" so the user has time to find the URL they want before IE closes.

As already mentioned above, the biggest difficulty, and greatest learning experience I had while doing this project was VBA IE automation. Examples we had performed in class with forms was limited to filling in simple username and password text fields, while the forms I worked with in my project had several text fields, radio buttons, and dropdown fields in them. I also found that several of the pages I selected to gather information from used odd presentation methods for their pages so my "appIE.document.body.innertext" was unable to get the information I needed from them. I experimented with other techniques such as attempting to highlight, copy, and paste the information into a VBA variable, but that did not work. In the end I was able to find websites that had the information I needed, in a form that I could harvest.

This project has taught me a lot about how VBA handles IE automation, and I have learned a great deal from Microsoft's documentation on the IE automation methods.

Assistance

I made use of some code located on the web at http://www.jpsoftwaretech.com/excel-vba/automate-internet-explorer/ to help with my IE automation.

I copied several sections and made heavy modifications to the code on the site in order to suit my needs.