Homework 8 (due Thursday Apr. 13th, 11:00 AM)

In this assignment, you will be querying the USDA nutritional facts database using their XML API. Using this, you will make a GUI that searches the database and displays the nutritional facts for the first 7 results.

A full description of how the API works can be found at http://ndb.nal.usda.gov/ndb/api/doc.

In short:

- A user can go to a web-page like

  http://api.nal.usda.gov/usda/ndb/reports/?ndbno=01009&type=b&format=xml&api_key=DEMO_KEY

  and the result will be an XML file containing nutritional facts for ndbno#01009 (Cheddar Cheese). By changing the ndbno number a user can get nutritional data for different foods.

- To help find these ndbno number the API also provides a search by going to a URL such as:

  http://api.nal.usda.gov/usda/ndb/search/?format=xml&q=butter&max=25&offset=0&api_key=DEMO_KEY

  where 'butter' is the keyword being searched. This returns an XML file with search results.

- In order to access this database an API_KEY must used and needs to be obtained at https://api.data.gov/signup/.

To assist you with accessing the database, the MATLAB class **`USDA`** is provided. The USDA class has three public methods:

- A constructor which takes a string **`api_key`** as input obtained by signing up at https://api.data.gov/signup/.

- **`search`** which takes as an input a string containing keywords like 'peanut+butter'. This method uses webread to access the appropriate URL and returns a Document Object Model (DOM) of XML file of the search results.

- **`reports`** which takes as an input a string containing a 5-digit nbno number. This method uses webread to access the appropriate URL and returns a Document Object Model (DOM) of the XML file containing the nutritional data.

Use 'help USDA' to see a more detailed description of the class and methods.

For the Assignment you will make one class called **`USDAGUI`** that:

- Inherits **`USDA`**
- Includes a constructor that takes a string **`api_key`** as input
- Adds one method called **`StartGUI`** which starts up the GUI
- Has no public properties

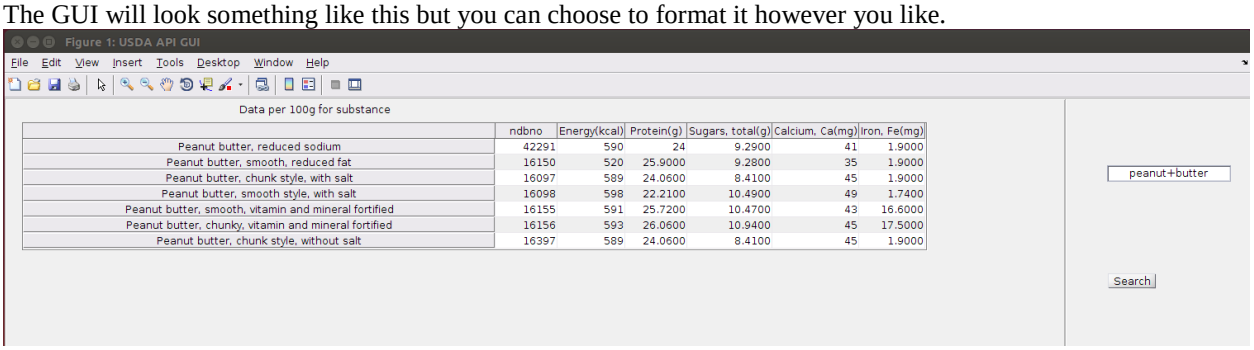
The GUI must have:

- A field where a user inputs the string containing keyword for the search

- A button which initiates the Search which says 'Search'
- A uitable which shows GUI that searches the database and displays the nutritional facts for the first 7 results
- Pick any 5 nutritional facts e.g. “Energy” or “Fiber, total dietary" to display in the table
- Also display ndbno number in the uitable
- The rows should be labeled by the Name of the food (Since the names of some food are very long, you can simply use the first string before the comma)
- The Columns should be labeled by the nutrient name along with correct units.

NOTE: All data must be accessed via the DOM objects that are returned by the methods of USDA. The included XML files are only for reference.

The GUI will look something like this but you can choose to format it however you like.



	ndbno	Energy(kcal)	Protein(g)	Sugars, total(g)	Calcium, Ca(mg)	Iron, Fe(mg)
Peanut butter, reduced sodium	42291	590	24	9.2900	41	1.9000
Peanut butter, smooth, reduced fat	16150	520	25.9000	9.2800	35	1.9000
Peanut butter, chunk style, with salt	16097	589	24.0600	8.4100	45	1.9000
Peanut butter, smooth style, with salt	16098	598	22.2100	10.4900	49	1.7400
Peanut butter, smooth, vitamin and mineral fortified	16155	591	25.7200	10.4700	43	16.6000
Peanut butter, chunky, vitamin and mineral fortified	16156	593	26.0600	10.9400	45	17.5000
Peanut butter, chunk style, without salt	16397	589	24.0600	8.4100	45	1.9000

Submit the homework on bCourses. You should create a folder named **`lastname_firstname_hw8`**. Place all of your m-files in this folder and zip it. Please upload this single zip file.

MORE DATABASE FUN: If you liked collecting and looking at data. Go to http://www.data.gov/ and search to see a bunch more datasets compiled by the US government. To see only XML APIs after searching look in the column on the left for “Formats” and select “XML”. Link to search of Data.gov with keyword "climate" and XML Format Filter