

- 1) My chatbot will answer questions about nearby restaurants based on the user's input location and type of food they are looking for. I chose this type of chatbot because i always have a hard time finding/choosing a place to go eat. I would like to also have it offer a personal suggestion of where to eat based on some criteria that i have yet to pin down. I plan to use the mapquest API because i am somewhat familiar with it and python from a previous course where we used it to get directions.

Part 3 updates: I still used api's from the mapquest website however i would like to include the correct names for documentations sake. I used the mapquest Geocoding api and Search api.

Part 4 updates: I added the mapquest directions api to support features i planned to add from part 3.

- 2) I plan to use python and its standard libraries and the mapquest API. I plan to start using the CKYParse from part 1 of the project, however there is always the possibility that I might end up needing/wanting to make adjustments or something new.

Part 3 updates: I ran into a conflict with CYKParse and the scope for the amount of inputs my chatbot could accept. Including every restaurant possibility in a grammar would be a complete waste of time not to mention an extremely large text file and there is no way i would be able to create an indexable grammar and lexicon of street addresses to accept. This led me to use a different method to parse the input request which can handle the range of possible requests. For now it is a very simple implementation. The input string is split using the builtin split() function and the string is searched for words "near" or "around", the two most common words when asking about options to eat in an area. Words before the split at "near" or "around" are put into the query field for the api pull request and words after the split are passed to the geocoding api to get the coordinates of the address that is expected to follow.

-for the next part of the project i would like to expand upon this simple interpreter to take more complex/complete sentences as requests.

Part 4 update: custom interpreter was expanded to accept a wider variety of sentences. I have provided my personal api key for mapquest in the code which should work fine. If for any reason it does not there is a variable KEY listed at the top of the file which can be changed to another.

One thing to note is that technically, the api will return a listing fitting ANY keyword (something i realized while doing screenshots for the last part of the report) and thus a search for anything is actually possible rather than being limited to food.

"Laundromat" would indeed return the nearest laundromat however the sentence parser was created only based on food-related examples and is not guaranteed on anything but that.

- 3) Phase 1 will be augmenting CYKParse with a grammar and lexicon that fits the needs of this project.

Phase 2 will focus on supporting food-based location answers. This is the use i thought of first for the project so i want to have this mostly working first

Phases 1 and 2 will be turned in for part 3 on March 1st

Phase 3 will add categories of food (fast food, seafood, burgers) and possibly a recommendation based on the rating of the place (i do forget if that is available through the mapquest api) or perhaps just on my (or the chatbot's) personal preference.

Phase 3 will be turned in for the final part of the project

Part 3 updates: As it turns out, phase 3 was pretty much built-in to the api and was incredibly easy to implement. This version contains all three phases. Phase 3 works 99% as intended, however there are some unique limits as to what specific keywords are recognized by the api to return types of food versus restaurants with the name of the food. Because of this, for part 4 i will be adding the ability to get directions to your restaurant of choice as well after making a search. I also would *like* to improve upon the custom interpreter to take in more complex/complete sentences however to what extent i will be able to implement that is yet to be known. As mentioned in the previous section, i also replaces CKYParse with a different interpretation function.

Part 4 updates: directions successfully implemented and the interpreter does accept more sentence structures.

- 4) Bot : "Hi, welcome to *whatever name i give it*. To get started, where are you located?"

User: irvine

The bot will then store that location so that any time a location is not specifically mentioned it will search within the entire city location

User:"What food is around *insert address*"

Bot: The nearest food to *address* is [list of food by distance in a 5 mile radius]

User:"fast food"

Bot : The nearest fast food to *Address* is [list of fast food by distance in a 5 mile radius]

Here, we will have the bot also separately store the last used location so that more inquiries may be made about an area without re-typing every single time. Using the word "me" as in "near me" or "around me" will search based on the initial location given when starting the chatbot.

User: seafood near me

Bot: The closest seafood restaurants to you are [list of seafood by distance in 5 mile radius]

Part 3 updates: Adjustments to the bot's communication and text layout. No functional changes

Part 4 updates: Additional sentence structures are accepted. "Where is the nearest coffee shop" ; "what are the closest mcdonalds around me" ; and other variations following the structure where a place/type of food follows the words [closest, nearest] optionally splitting the desired location with the words [around, near, to].

- 5) Augmenting CKYParse to include keywords related to food. "Seafood, coffee, fast food, bar, fine dining, etc" will be added to the list of recognizable words. Extra grammars will be added (and some removed) to interpret different forms of questions.

Part 3 updates: As mentioned in part 2 i have replaced CYKParse with a custom interpreter for user input that allows it to function as i originally specified instead of being limited by how large and detailed i created a grammar for CYKParse.

Part 4 updates: custom interpreter now accepts a wider variety of sentences. Since the APIs used work extremely hard to always return some sort of valid address/location I do not check if an address or food type is valid since there would be no crash in the program anyway and it would be nearly impossible to have a complete dataset of all valid addresses. ALL sentences are expected to have no punctuation, however the api works around them automatically and it will not interrupt or corrupt a search by having them. The parser however checks for the word "me" to use a user's personal location. Since it goes word by word a punctuation ending after the word "me" will cause it to use the api search on the location "me?" which still returns valid results although not in the area you would want.

The parser is essentially a decision tree that splits based on common keywords that define parts of a sentence. The sentence is then split according to the assumption that it is grammatically correct; i.e. the sentence "what are the closest mcdonalds around me" would split at the word 'closest' first. It would then split at the word 'around' and have the query become all words after "closest" and before "around" and the location would be all words after "around". This allows for multi-word restaurant searches and any address to be input while also permitting room for any variations of starting the question simply because the phrasing does not matter. "what are the closest mcdonalds around me" is parsed the same as "Where is the closest mcdonalds to me" and so on as long as the keywords are present.

- 6) All of the location based data should be able to be retrieved from the Open Search API provided from the mapquest website. Minimal internal data storage will be in the form of storing the users location, the location of the last request, maybe the user's name if i want it to be more personal, and temporary variables for holding exactly what is being searched for.

Part 3 updates: the search api depends on longitude and latitude to properly return search results. To work with this limitation i used the mapquest geocoding api that takes an address and returns its longitude and latitude. A minor addition but does add some more internal variables

Part 4 updates: minor storage added to hold directions to a location for display to the user.

- 7) For output, I will take the parsed sentence and retrieve the important key-words. I will then run a request through the Open Search API and sort through the result list given to me to build a list of relevant items and information. Then I will format a response to show the list and information to the user.

Part 3 updates: Technically, i did not change the way i intended to parse the sentence. The only difference is that I created my own interpreter to allow the variety of search possibilities and addresses of users. Again, I note that I used both the mapquest geocoding api and search api that i had not originally written down in my part 2 submission.

Part 4 update: Optional additional output can be obtained if the user says yes to receiving directions to a listed location result. This is run through the mapquest directions api

Example showing different request inputs return the same correct output

```
Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for
burgers
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758

burgers near 8149 suarez way
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758

burgers near me
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758
```

Example using different address than the initial 'me' address properly returns different results but also saves your initial address for any further requests

```
Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
To make a request, simply enter the type of food or restaurant you are looking for
burgers near me
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758

burgers near 6461 Hogan Dr Sacramento, CA 95822
The closest " burgers " are:

McDonald's, 2335 Florin Rd, Sacramento, CA 95822
Jack in the Box, 5800 Freeport Blvd, Sacramento, CA 95822
Burger King, 5610 Freeport Blvd, Sacramento, CA 95822
McDonald's, 4124 Florin Rd, Sacramento, CA 95823
The Habit Burger Grill, 4730 Freeport Blvd, Sacramento, CA 95822
McDonald's, 8940 Pocket Rd, Sacramento, CA 95831
Burger King, 7225 Greenhaven Dr, Sacramento, CA 95831
Jack in the Box, 4435 Florin Rd, Sacramento, CA 95823
Ford's Real Hamburger, 1948 Sutterville Rd, Sacramento, CA 95822
Grill-A-Burger, 10 Vista Alegre Ct, Sacramento, CA 95831

burgers
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758

burgers near me
The closest " burgers " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
Burger King, 8637 Elk Grove Blvd, Elk Grove, CA 95624
Red Robin Gourmet Burgers, 8245 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
Five Guys, 9257 Laguna Springs Dr, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
Denny's, 8707 Elk Grove Blvd, Elk Grove, CA 95624
Burger Physical Therapy & Rehabilitation, 7805 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
The Habit Burger Grill, 7400 Laguna Blvd, Elk Grove, CA 95758
```


Example showing various food type requests

```
Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for
coffee shops near me
The closest " coffee shops " are:

Boba Tea House, 8139 Elk Grove Blvd, Elk Grove, CA 95758
Starbucks, 8450 Elk Grove Blvd, Elk Grove, CA 95758
Happy Cafe, 9650 Auto Center Dr, Elk Grove, CA 95757
Peet's Coffee, 7127 Elk Grove Blvd, Elk Grove, CA 95758
Milk Tea Shop Corp, 8460 Elk Grove Blvd, Elk Grove, CA 95758
Savvy House Coffee Bar, 9630 Bruceville Rd, Elk Grove, CA 95757
18 Grams Coffee & Tea, 9677 E Stockton Blvd, Elk Grove, CA 95624
Starbucks, 10064 Bruceville Rd, Elk Grove, CA 95757
Dutch Bros Coffee, 8610 Elk Grove Blvd, Elk Grove, CA 95624
Peet's Coffee, 8234 Laguna Blvd, Elk Grove, CA 95758

seafood
The closest " seafood " are:

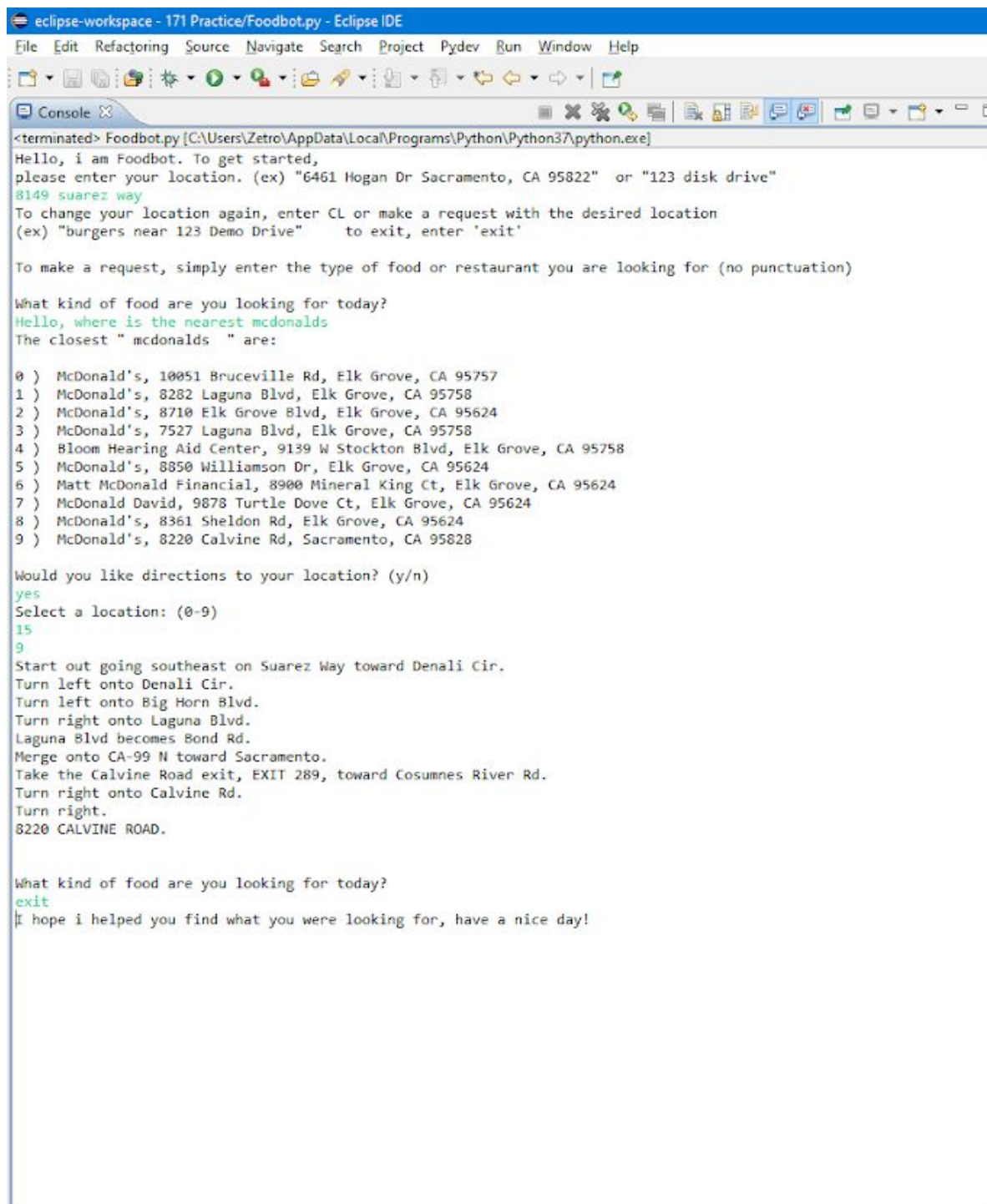
Well Season Seafood Restaurant, 9089 Bruceville Rd, Elk Grove, CA 95758
Wasabi Sushi Seafood Restaurant, 2745 Elk Grove Blvd, Elk Grove, CA 95758
Peach Garden Seafood Restaurant, 8420 Elk Grove Florin Rd, Elk Grove, CA 95624
The Shrimp Lover, 6427 Mack Rd, Sacramento, CA 95823
Seafood City Supermarket, 6051 Mack Rd, Sacramento, CA 95823
Long John Silver's, 7228 Stockton Blvd, Sacramento, CA 95823
Mariscos Islitas De Nayarit, 7216 Lindale Dr, Sacramento, CA 95828
True World Foods, 8384 Rovana Cir, Sacramento, CA 95828
Rockin Crawfish, 6666 Stockton Blvd, Sacramento, CA 95823
Seafood House Quan Oc, 6471 Stockton Blvd, Sacramento, CA 95823

mcdonalds
The closest " mcdonalds " are:

McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
Bloom Hearing Aid Center, 9139 W Stockton Blvd, Elk Grove, CA 95758
McDonald's, 8850 Williamson Dr, Elk Grove, CA 95624
Matt McDonald Financial, 8900 Mineral King Ct, Elk Grove, CA 95624
McDonald David, 9878 Turtle Dove Ct, Elk Grove, CA 95624
McDonald's, 8361 Sheldon Rd, Elk Grove, CA 95624
McDonald's, 8220 Calvine Rd, Sacramento, CA 95828
```

Part 4 examples:

Getting directions and showcasing the new sentences allowed by the extended sentence parser



```
eclipse-workspace - 171 Practice/Foodbot.py - Eclipse IDE
File Edit Refactoring Source Navigate Search Project Pydev Run Window Help

<terminated> Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for (no punctuation)
What kind of food are you looking for today?
Hello, where is the nearest mcdonalds
The closest " mcdonalds " are:

0 ) McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
1 ) McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
2 ) McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
3 ) McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
4 ) Bloom Hearing Aid Center, 9139 W Stockton Blvd, Elk Grove, CA 95758
5 ) McDonald's, 8850 Williamson Dr, Elk Grove, CA 95624
6 ) Matt McDonald Financial, 8900 Mineral King Ct, Elk Grove, CA 95624
7 ) McDonald David, 9878 Turtle Dove Ct, Elk Grove, CA 95624
8 ) McDonald's, 8361 Sheldon Rd, Elk Grove, CA 95624
9 ) McDonald's, 8220 Calvine Rd, Sacramento, CA 95828

Would you like directions to your location? (y/n)
yes
Select a location: (0-9)
15
9
Start out going southeast on Suarez Way toward Denali Cir.
Turn left onto Denali Cir.
Turn left onto Big Horn Blvd.
Turn right onto Laguna Blvd.
Laguna Blvd becomes Bond Rd.
Merge onto CA-99 N toward Sacramento.
Take the Calvine Road exit, EXIT 289, toward Cosumnes River Rd.
Turn right onto Calvine Rd.
Turn right.
8220 CALVINE ROAD.

What kind of food are you looking for today?
exit
I hope i helped you find what you were looking for, have a nice day!
```


Further showing the new sentence structures allowed and verifying correctness using the same directions from the previous example. (Directions will always be from YOUR current location, however searching near another area correctly returns the nearest type of search query

```
eclipse-workspace - 171 Practice/Foodbot.py - Eclipse IDE
File Edit Refactoring Source Navigate Search Project Pydev Run Window Help

Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
6461 Hogan Dr Sacramento, CA 95822
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for (no punctuation)

What kind of food are you looking for today?
mcdonalds
The closest " mcdonalds " are:

0 ) McDonald's, 2335 Florin Rd, Sacramento, CA 95822
1 ) Modern Line McDonalds, 2335 Florin Rd, Sacramento, CA 95822
2 ) McDonald's, 4124 Florin Rd, Sacramento, CA 95823
3 ) McDonald's, 8940 Pocket Rd, Sacramento, CA 95831
4 ) McDonald's, 5425 Fruitridge Rd, Sacramento, CA 95820
5 ) McDonald's, 6091 Florin Rd, Sacramento, CA 95823
6 ) McDonald's, 4731 Mack Rd, Sacramento, CA 95823
7 ) McDonald's, 2985 Freeport Blvd, Sacramento, CA 95818
8 ) McDonald Plumbing HTG & Air, 3618 Broadway, Sacramento, CA 95817
9 ) McDonald Plumbing HTG & Air, 3618 Broadway, Sacramento, CA 95817

Would you like directions to your location? (y/n)
where are the closest mcdonalds to 8149 suarez way
n

What kind of food are you looking for today?
where are the closest mcdonalds to 8149 suarez way
The closest " mcdonalds " are:

0 ) McDonald's, 10051 Bruceville Rd, Elk Grove, CA 95757
1 ) McDonald's, 8282 Laguna Blvd, Elk Grove, CA 95758
2 ) McDonald's, 8710 Elk Grove Blvd, Elk Grove, CA 95624
3 ) McDonald's, 7527 Laguna Blvd, Elk Grove, CA 95758
4 ) Bloom Hearing Aid Center, 9139 W Stockton Blvd, Elk Grove, CA 95758
5 ) McDonald's, 8850 Williamson Dr, Elk Grove, CA 95624
6 ) Matt McDonald Financial, 8900 Mineral King Ct, Elk Grove, CA 95624
7 ) McDonald David, 9878 Turtle Dove Ct, Elk Grove, CA 95624
8 ) McDonald's, 8361 Sheldon Rd, Elk Grove, CA 95624
9 ) McDonald's, 8220 Calvine Rd, Sacramento, CA 95828

Would you like directions to your location? (y/n)
yes
Select a location: (0-9)
9
Start out going east on Hogan Dr toward 23rd St.
Turn left onto 24th St.
Turn right onto 47th Ave.
Merge onto CA-99 S toward Fresno.
Take the Cosumnes River Blvd/Calvine Road exit, EXIT 289.
Turn left onto Cosumnes River Blvd.
Cosumnes River Blvd becomes Calvine Rd.
Turn right.
8220 CALVINE ROAD.

What kind of food are you looking for today?
```

Some error handling with blank inputs (all others will just be searched for and return the closest match the api can manage thus a blank input is almost the only 'incorrect' input

```
eclipse-workspace - 171 Practice/Foodbot.py - Eclipse IDE
File Edit Refactoring Source Navigate Search Project Pydev Run Window Help

Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"

8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for (no punctuation)
What kind of food are you looking for today?

What kind of food are you looking for today?
|
What kind of food are you looking for today?

What kind of food are you looking for today?

What kind of food are you looking for today?
closest coffee shop to me
The closest " coffee shop " are:

0 ) Boba Tea House, 8139 Elk Grove Blvd, Elk Grove, CA 95758
1 ) Starbucks, 8450 Elk Grove Blvd, Elk Grove, CA 95758
2 ) Happy Cafe, 9650 Auto Center Dr, Elk Grove, CA 95757
3 ) Peet's Coffee, 7127 Elk Grove Blvd, Elk Grove, CA 95758
4 ) Milk Tea Shop Corp, 8460 Elk Grove Blvd, Elk Grove, CA 95758
5 ) Savvy House Coffee Bar, 9630 Bruceville Rd, Elk Grove, CA 95757
6 ) 18 Grams Coffee & Tea, 9677 E Stockton Blvd, Elk Grove, CA 95624
7 ) Starbucks, 10064 Bruceville Rd, Elk Grove, CA 95757
8 ) Dutch Bros Coffee, 8610 Elk Grove Blvd, Elk Grove, CA 95624
9 ) Peet's Coffee, 8234 Laguna Blvd, Elk Grove, CA 95758

Would you like directions to your location? (y/n)

u
o
y
Select a location: (0-9)
-4
0
Start out going southeast on Suarez Way toward Denali Cir.
Turn left onto Denali Cir.
Turn left onto Big Horn Blvd.
Turn left onto Elk Grove Blvd.
Turn right.
Turn right.
Turn slight left.
8139 ELK GROVE BOULEVARD.
```

Interestingly, the bot itself is limited to food in name only as the api will search for anything given as a query. The only way to limit this would be to build an incredibly large list of permitted words including all restaurants and food types and as such is left as is.

```
eclipse-workspace - 171 Practice/Foodbot.py - Eclipse IDE
File Edit Refactoring Source Navigate Search Project Pydev Run Window Help

<terminated> Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for (no punctuation)

What kind of food are you looking for today?
laundromat
The closest " laundromat " are:

0 ) Al Laundromat, 8275 Florin Rd, Sacramento, CA 95828
1 ) FL Laundromat & Purewater, 6625 Florin Rd, Sacramento, CA 95828
2 ) T T Laundromat, 6645 Stockton Blvd, Sacramento, CA 95823
3 ) Sac City Coin Laundromat, 2805 12th Ave, Sacramento, CA 95817
4 ) Robbins Laundromats LLC, 8444 Bennington Way, Sacramento, CA 95826
5 ) Megawash Laundromat, 6002 Fair Oaks Blvd, Carmichael, CA 95608
6 ) Plaza Laundromat and Drive-Thru Cleaners, 2420 W Turner Rd, Lodi, CA 95242
7 ) Plaza Laundromat, 6639 Auburn Blvd, Citrus Heights, CA 95621
8 ) Central Laundromat, 612 S Central Ave, Lodi, CA 95240
9 ) Suds City Laundromat, 3255 W Hammer Ln, Stockton, CA 95209

Would you like directions to your location? (y/n)
y
Select a location: (0-9)
4
Start out going southeast on Suarez Way toward Denali Cir.
Turn left onto Denali Cir.
Turn left onto Big Horn Blvd.
Turn right onto Laguna Blvd.
Laguna Blvd becomes Bond Rd.
Turn left onto Elk Grove Florin Rd.
Elk Grove Florin Rd becomes S Watt Ave.
Turn left onto Jackson Rd/CA-16.
Turn right onto Florin Perkins Rd.
Florin Perkins Rd becomes Julliard Dr.
Turn right onto Occidental Dr.
Turn left onto Bennington Way.
8444 BENNINGTON WAY is on the left.

What kind of food are you looking for today?
exit
I hope i helped you find what you were looking for, have a nice day!
```


Despite some try-except statements to handle errors from bad requests (as seen with “near near” as an input the api rarely fails to return a request and will simply return a valid, but empty list. Errors are caught wherever they arise however such as asking for directions on a blank list.

```
eclipse-workspace - 171 Practice/Foodbot.py - Eclipse IDE
File Edit Refactoring Source Navigate Search Project Pydev Run Window Help
[Icons]
Console
Foodbot.py [C:\Users\Zetro\AppData\Local\Programs\Python\Python37\python.exe]
Hello, i am Foodbot. To get started,
please enter your location. (ex) "6461 Hogan Dr Sacramento, CA 95822" or "123 disk drive"
8149 suarez way
To change your location again, enter CL or make a request with the desired location
(ex) "burgers near 123 Demo Drive" to exit, enter 'exit'

To make a request, simply enter the type of food or restaurant you are looking for (no punctuation)

What kind of food are you looking for today?
near near
Sorry, your input was either in an incorrect format or unable to be processed.

What kind of food are you looking for today?
toto
The closest " toto " are:

0 ) Toto's Plumbing, 2301 Courtland Ave, Oakland, CA 94601
1 ) Totos Grill, 21933 Foothill Blvd, Hayward, CA 94541
2 ) The Toto Station, 4938 Paseo Padre Pkwy, Fremont, CA 94555
3 ) Toto USA, 190 King St, San Francisco, CA 94107
4 ) Toto's Pizzeria & Restaurant, 1690 El Camino Real, South San Francisco, CA 94080
5 ) Toto's Paint, 3547 Haven Ave, Menlo Park, CA 94063
6 ) Toto's Master Cabinets, 3547 Haven Ave, Menlo Park, CA 94063
7 ) Toto's Pizzeria & Restaurants, 2727 S El Camino Real, San Mateo, CA 94403
8 ) Toto's Pizzeria & Restaurant, 1690 El Camino Real, San Bruno, CA 94066
9 ) Toto's Pizzeria & Restaurant, 1250 El Camino Real, Belmont, CA 94002

Would you like directions to your location? (y/n)
to to
n

What kind of food are you looking for today?
to to
The closest " to to " are:

Would you like directions to your location? (y/n)
y
Select a location: (0-9)
1
Sorry, your input was either in an incorrect format or unable to be processed.

What kind of food are you looking for today?
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