Bringing Cats Cafe sensation to HTX

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Project: Capstone Data science course

A. Introduction

Etymology: Cat café has been officially recognized in the online edition of the Oxford Dictionary of English since August 2015

A.1. What is a cat café?

Cat cafe businesses offer people a place to relax with friends and felines, while they also enjoy a beverage or meal. In addition to serving human customers, many cafes also help the cats they house by making the cats available for adoption.

The world's first cat café, "Cat Flower Garden", opened its doors in Taipei, Taiwan, in 1998. The Taiwanese cat café eventually became a tourist destination, attracting tourists from Japan as well as all over the globe.

Although the origin of cat café is in Taiwan, the concept blossomed in Japan, where the first one named "Neko no Jikan" ("Cat's Time") was opened in Osaka in 2004. Due to the Japan's land size and population, many residents live in small apartments or condominiums, which do not allow pets, making a cat café a very popular destination for young workers looking for the companionship and comfort offered. Tokyo's first cat café, named "Neko no mise" (Shop of Cats), opened in 2005.

After this, the popularity of cat cafés boomed in Japan. From 2005 to 2010, seventy-nine cat cafés opened across the country.

Cat cafés are quite popular in Japan, with Tokyo being home to 58 cat cafés as of 2015.[9] The first was Cat's Store (猫の店 Neko no Mise), by Norimasa Hanada, which opened in 2005. The popularity of cat cafés in Japan is attributed to many apartments forbidding pets, and to cats providing relaxing companionship in what may otherwise be a stressful and lonesome urban life.

Every cat café in Japan is required to obtain a license and comply with the strict requirements and regulations of the nation's Animal Treatment and Protection Law.

Japanese cat cafés feature strict rules to ensure cleanliness and animal welfare, in particular seeking to ensure that the cats are not disturbed by excessive and unwanted attention, such as by young children or when sleeping. Many cat cafés also seek to raise awareness of cat welfare issues, such as abandoned and stray cats and many often have cats from local animal shelters to help them lose any fear of humans and advertise them for possible adoption.

Since Japan, many countries have adopted the concept and idea of cat café from one side to the others of the world.

The demand is much larger than supply for cat cafes.

For Asian countries, there are India, South Korea, Singapore, Thailand and Taiwan as I mentioned earlier. In Europe, cat café is open in Austria Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Netherlands, Poland, Romania, Russia, Slovakia, Ukraine, and the U.K. Then in North America, we have Canada, the U.S. and Mexico. Even in Oceania area, we have New Zealand and Australia.

A.2. **How the U.S. became obsessed with cat café**

Here is a cat café image in California:

In contrast to Japanese cat cafés, U.S. cafes typically focus on adoptions. Within seven months of being open, Cat Town reported that "the euthanasia rate at its partner shelter has declined from 41 to 21 percent, and 184 cats have made the transition from the cafe's Cat Zone to permanent homes".

Similarly, The Cat Cafe in San Diego has facilitated adoptions for more than 250 cats (January 2015 - October 2017) and KitTea of San Francisco has adopted 203 (June 2015 - February 2018).

In June 2015, Crumbs and Whiskers opened its first cat café in Washington, D.C., where it partnered with the local chapter of the Humane Society; this café provides a boarding space for around 15–25 cats at a time, all of which are provided by the Humane Society and made available for adoption.

In the United States, most health departments also require special steps to separate the cafe area from area where the cats are housed. In some cases, this even extends to areas that cats pass through only briefly (e.g., an adopted cat must leave through a separate door without passing an area that prepares food).

Gaining regulatory approval can be difficult, as with KitTea of San Francisco. Starting the process in November 2013, KitTea's design was finally approved in August 2014 after extensive negotiation with San Francisco's Health Department. Oakland's Cat Town was the first cat cafe to open its doors to customers, signing a lease in July 2014 and opening just months later in October.

These timelines highlight not only the regulatory hurdles for cat cafes that prepare food on premises, but also differences between local governments that are mere miles from one another.

A.3. How to start a business incorporating with a heart for non-profit

There are many steps involving opening a cat café business.

1. Choose a Name for Your Cat Café
2. Create a Business Plan
3. Research Local Regulations and Restrictions
4. Determine Your Model of Operation
5. Secure a Location
6. Partner with Local Cat Rescue Organizations
7. Determine Menu and Pricing (such as Make Sure Your Cookies are Cat-Hair Free)
8. Create a Website to promote business and bring awareness
9. And so on……..

B. Problem and proposition

The Goal for Business with a heart

B. 1. In order to understand why we have a problem to solve, we need to consider the main steps to consider in opening a cat café.

a. Who is this business right for?

People who are outgoing and have a passion for cats may enjoy running a cat cafe business. Additionally, business owners also spend a lot of time caring for the cats their cafe houses.

b. What happens during a typical day at a cat cafe?

- taking care of cats (i.e. giving them food & water, changing their litter boxes, etc.)
- getting cats any veterinary care they might need
- processing adoption applications submitted by customers
- welcoming customers
- serving customers food and beverages
- overseeing the area to ensure all cats and people are behaving appropriately

c. What is the target market?

The target market of a cat cafe business is people who love cats.

Cat lovers may come for a variety of reasons:

- To spend time with cats if they themselves don't have one
- To hang out with friends in a fun environment
- To support a shelter they believe in

d. How does a cat cafe make money?

Cat cafe businesses make money two ways. They charge customers by the hour for the time that customers spend with cats, and they charge customers for the food and beverages they order.

e. What is the growth potential for a cat cafe?

Because this is a relatively new business in the USA, most cat cafe businesses have only one location. However, some have expanded to several locations.

f. Then we have to consider the costs involved in opening a cat café
g. So on…

B. 2. Location! Location! Location!

As you can see in the business overview, the location of the business is very important since it takes part in how the operation will be such as determining costs, the products selection to serve the demographically common crowd, the surrounding shelters or rescues close enough for the convenience of transporting and caring for the furballs, an area where there are many cats lovers but housing is somewhat pets restricted so there is a higher chance for people to visit this coffee shop, etc.

And that is the goal for my project.

The focus is where is the best location to get the optimal rate of success and have the business as an attraction to operate a business and promote our feline friends at the same time.

C. Data acquisition, Cleaning, Result

For my project, the PetFinder API is one of the perfect fits.

I have access to every single pet with this database, so potential pet parents can find out the associated shelter or rescue group, who to contact, their information such as city, state, zip code, address. One of the key fields is pet ID for a table, and shelter ID and its info from another table with fields of email, phone, address, hours, website URL, mission statement, social media, photos, etc. Then to build a decision making table, keys can be the combination of foreign keys such as names, or ID of pet and shelter. Least but not last, a geographical data table of zip code plays an important role along with the count of cats in that zip code. Moreover, we have data for type of pets, breed or species, color, age, gender, size, temporary name or ID, description or biography, story, photos, adoption status, health and physical conditions such as spayed, neutered, declawed, shots up to date or not, what kind of environment is preferred, etc.

I utilized the functionality of FindPet in the API to make a search and retrieve data of cats available for adoption based on a city. Since it is such a big dataset, I then filtered the result to build a table that has 2 columns: zip code as key, and the count of pets available/found.

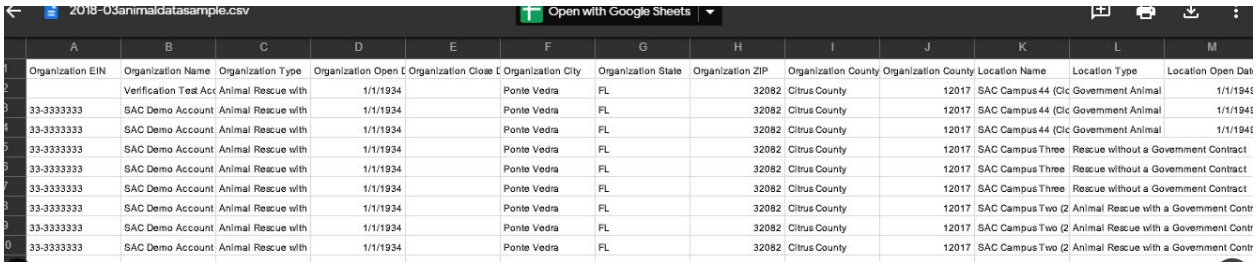
adoptablecatsbyziphtx.csv

	A	B
	zip	adoptable cats
	77002	0
	77003	0
	77004	0
	77005	0
	77006	0
	77007	7
	77008	188
	77009	0
	77010	0
	77011	0
	77012	0
	77013	0
	77014	0
	77015	14
	77016	0
	77017	0
	77018	11
	77019	35
	77020	0
	77021	0
	77022	0
	77023	0
	77024	102
	77025	61
	77026	68

I used Foursquare API to get the statistics for cats population, adoption centers, and so on.

Another crucial dataset is requested from online source, www.shelteranimalscount.org.

This is a csv file sample from shelteranimalscount.org representing the pets count per area.

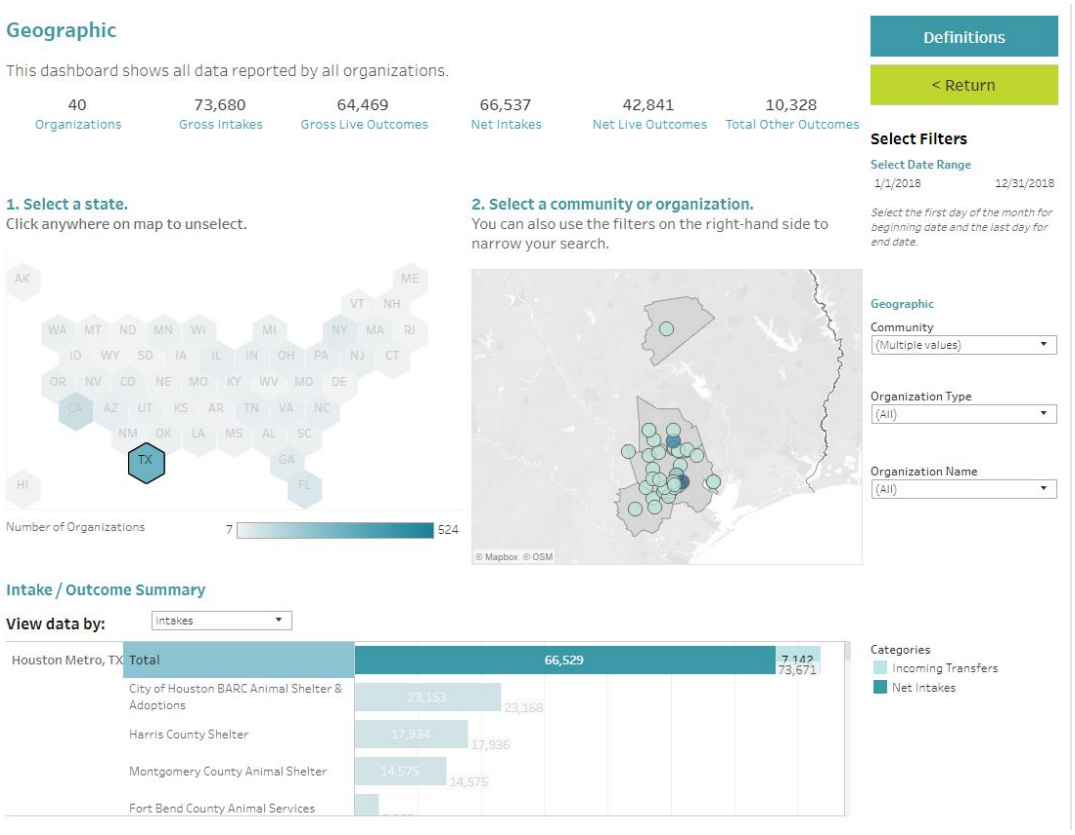


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Organization EIN	Organization Name	Organization Type	Organization Open D	Organization Close D	Organization City	Organization State	Organization ZIP	Organization County	Organization County	Location Name	Location Type	Location Open Dat
2		Verification Test Acc	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus 44 (Clc	Government Animal	1/1/1945
3	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus 44 (Clc	Government Animal	1/1/1945
4	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus 44 (Clc	Government Animal	1/1/1945
5	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Three	Rescue without a Government Contract	
6	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Three	Rescue without a Government Contract	
7	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Three	Rescue without a Government Contract	
8	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Two (2	Animal Rescue with a Government Contr	
9	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Two (2	Animal Rescue with a Government Contr	
10	33-3333333	SAC Demo Account	Animal Rescue with	1/1/1934		Ponte Vedra	FL	32082	Citrus County	12017	SAC Campus Two (2	Animal Rescue with a Government Contr	

I used that dataset extracted from reports requested from the Shelter Animals dashboard. The following definitions and abbreviations are used throughout these report:

- SAC: Shelter Animals Count
- OIE: owner intended euthanasia
- RBO: relinquished by owner
- RTO: return to owner
- RTO rate: total RTOs divided by the total of stray intakes
- RTF: return to field
- Location: unique address for services (organizations may have more than one location)
- Adjusted intake: total intake minus transfers in
- Adjusted outcome: total outcome minus transfers out
- Live outcomes: sum of adoptions, RTOs, RTFs, and transfers
- Live outcome rate: live outcomes divided by all outcomes
- Euthanasia rate: total euthanasia excluding owner intended euthanasia divided by total outcomes minus owner intended euthanasia

These screenshots are the visualization for data from the above resource, from generic to detailed information for Houston area.



Detailed Data Summary

This dashboard shows all data reported by all organizations.

Definitions

< Return

1. Use the right-side menu to filter the data.
2. Click on an organization or community in the charts below to view their data.

40	73,680	66,537	64,469	42,841	10,328
Organizations	Gross Intakes	Net Intakes	Gross Live Outcomes	Net Live Outcomes	Total Other Outcomes

		Cats				
		Adult	Up to 5 Months	Age Unknown	Total	Grand Total
Gross Intakes	Stray/At Large	3,495	6,735	7,368	17,598	17,598
	Relinquished by ..	2,220	2,462	1,827	6,509	6,509
	Owner-Intended ..	80	82	76	238	238
	Transferred in fr..	1,273	2,102	1	3,376	3,376
	Other Intakes	423	496	35	954	954
	Total	7,491	11,877	9,307	28,675	28,675
Gross Live Outcomes	Adoption	3,853	5,462	1,940	11,255	11,255
	Returned to Own..	104	6	1,946	2,056	2,056
	Transferred to an..	1,394	3,128	2,032	6,554	6,554
	Returned To Field	2,400	289	3,337	6,026	6,026
	Other Live Outco..	53	13	25	91	91
	Total	7,804	8,898	9,280	25,982	25,982
Other Outcomes	Died in Care	205	705	320	1,230	1,230
	Lost in Care	183	28	68	279	279
	Shelter Euthanas..	506	642	731	1,879	1,879
	Owner-Intended ..	55	70	32	157	157
	Total	949	1,445	1,151	3,545	3,545

Select Filters

Select Date Range
1/1/2018 12/31/2018
Select the first and last day of the month for beginning and end dates.

State: TX

Community: (Multiple values)

Organization Type: (All)

Organization Name: (All)

Species: Cats

Looking at the above view: These 40 organizations are the registered organizations with Employer ID Numbers (EIN/Tax ID) for Houston and surrounding Houston county.

Meanwhile, for just Houston city, we have 32 organizations.

This dashboard only displays data for organizations that turned in full data sets for the selected year. Organizations that only turned in partial data for that year will be excluded from the timeline.

1. Select a year: 2018

2. Use the right-side menu to filter the data.

32	28,620	25,244	25,964	19,411	3,543
Organizations	Gross Intake	Net Intake	Gross Live Outcomes	Net Live Outcomes	Total Other Outcomes

Select Filters

State: TX

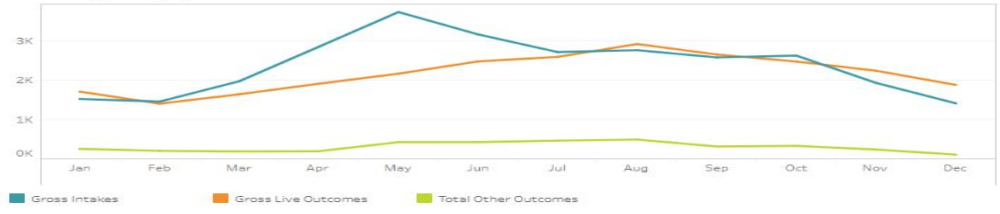
Community: Houston Metro, TX

Organization Name: (All)

Organization Type: (All)

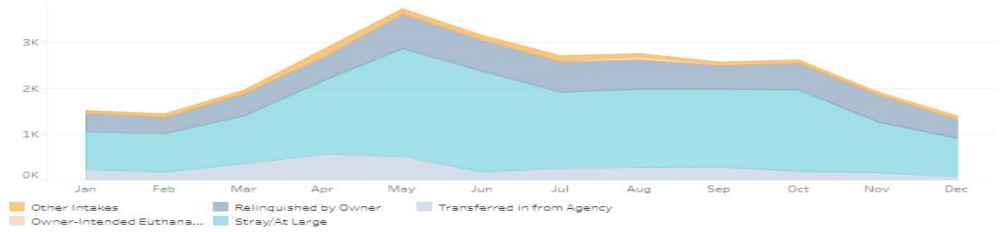
Species: Cats
(All)
Cats
Dogs
Cancel Apply

Timeline by Category

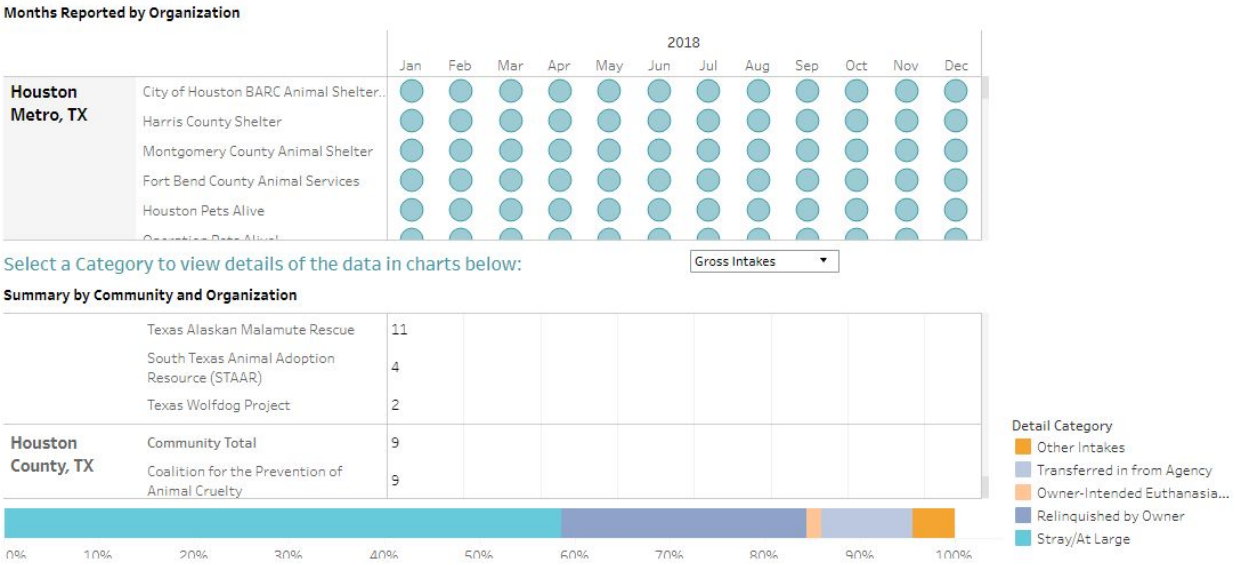


Timeline by Detail Category

View Category: Gross Intakes



Sample of some organizations and their numbers:

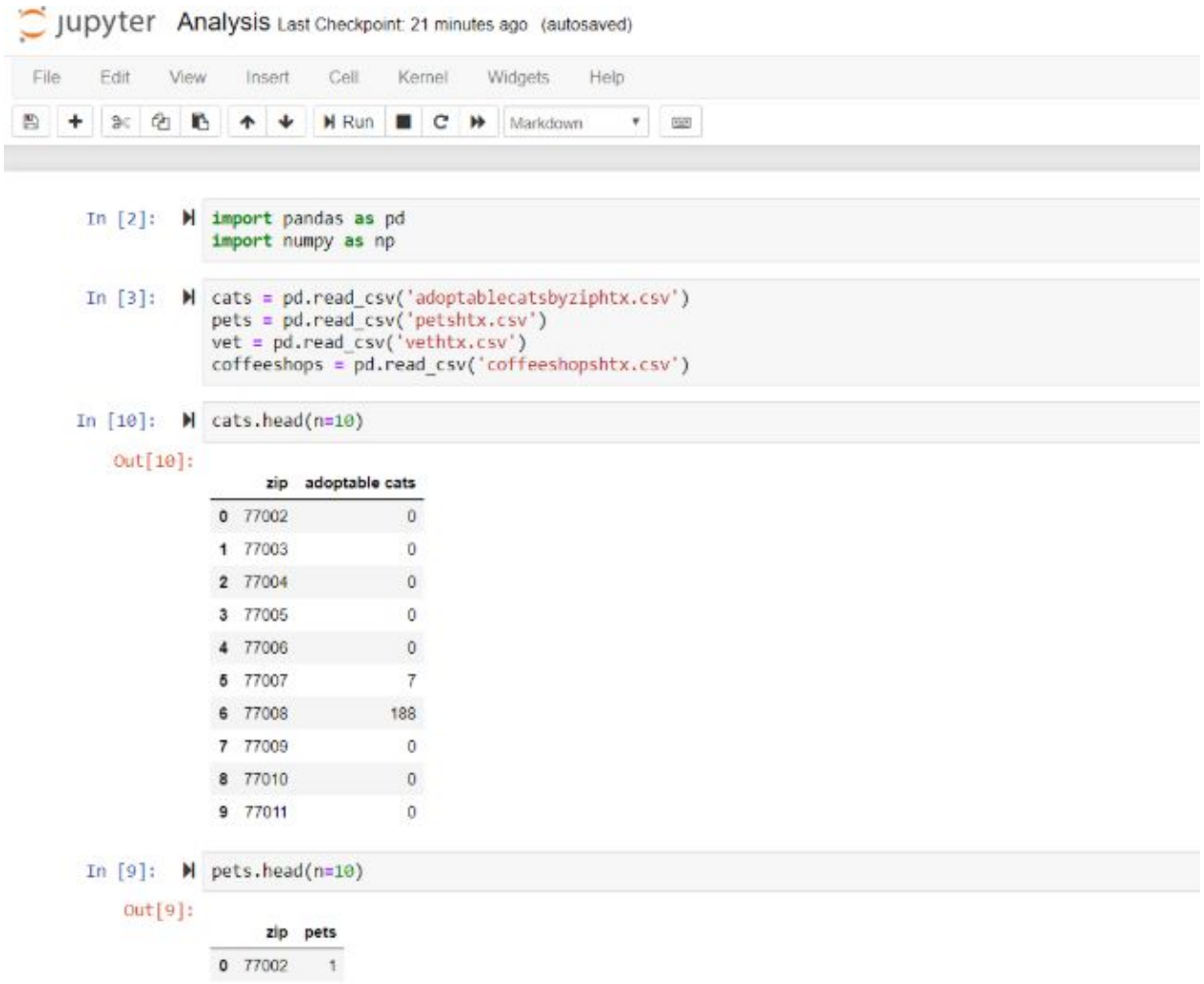


There are not many public datas related to demographic and social parameters for cats in the city, since Houston has not made and enforced the policy to register pets very long. Therefore I combine data tables to find the best zip code for starting the cat cafe.

I also used Google Map, ‘Search Nearby’ option to get some idea about the area with high density of coffee shop, which 2 of them are identified as cat cafe.

D. Methodology

From an online webpage, I scraped and came up with a dataframe that includes every zip code in Houston and the surrounding metro area. Since Houston's metro area is one of the largest in the United States, we were looking at over two hundred zip codes.



For each zip code, I found the number of cat shops, pet shops, veterinary clinics, and coffee shops using the foursquare API. It also came up with the number of adoptable cats in each zip code using an API from petfinder.com. I took advantage of a package called US zipcodes to convert zip codes into latitudes and longitudes so that I could take advantage of foursquare search-by-location functions.

jupyter PetFinder API Last Checkpoint: 20 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python

Run | Code

In [16]:

Out[16]: 0

In [9]:
```
byzip = []
```

In [10]:
```
for z in houstonzipcodes:
    location = z
    url = base + method + '?' + 'key=' + okey + '&animal=' + animal + "&location=" + str(location) + '&format=' + formattype
        '&count=' + str(count)# + '&offset=' + str(offset)
    #assumption, less than 1000 pets per zip code
    results = requests.get(url).json()['petfinder']['pets']['pet']
    number = [p['contact']['zip']['$t'] for p in results].count(str(location))
    byzip.append((location,number))
    print ((location,number))


    continue
```

```
(77002, 0)
(77003, 0)
(77004, 0)
(77005, 0)
(77006, 0)
(77007, 7)
(77008, 188)
(77009, 0)
(77010, 0)
(77011, 0)
(77012, 0)
(77013, 0)
(77014, 0)
(77015, 14)
(77016, 0)
```

jupyter Analysis Last Checkpoint: 21 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Run | Markdown

In [25]:
```
df = cats.merge(pets).merge(vet).merge(coffeeshops)
df.drop_duplicates()
```

Out[25]:

	zip	adoptable cats	pets	vet	coffee
0	77002	0	1	0	28
3	77003	0	0	2	5
6	77004	0	0	1	5
9	77005	0	0	2	8
12	77006	0	2	5	6
15	77007	7	2	6	8
18	77008	188	1	5	5
20	77009	0	0	0	1
22	77010	0	0	0	1
24	77011	0	0	1	3
26	77012	0	0	0	0
28	77013	0	0	0	0

In [31]:
```
from sklearn.linear_model import LinearRegression
```

In [ ]:

In [35]:
```
lr = LinearRegression()
```

In [36]:
```
X = df[['adoptable cats','pets','vet']]
y = df[['coffee']]
```

In [37]:
```
lr.fit(X,y)
```

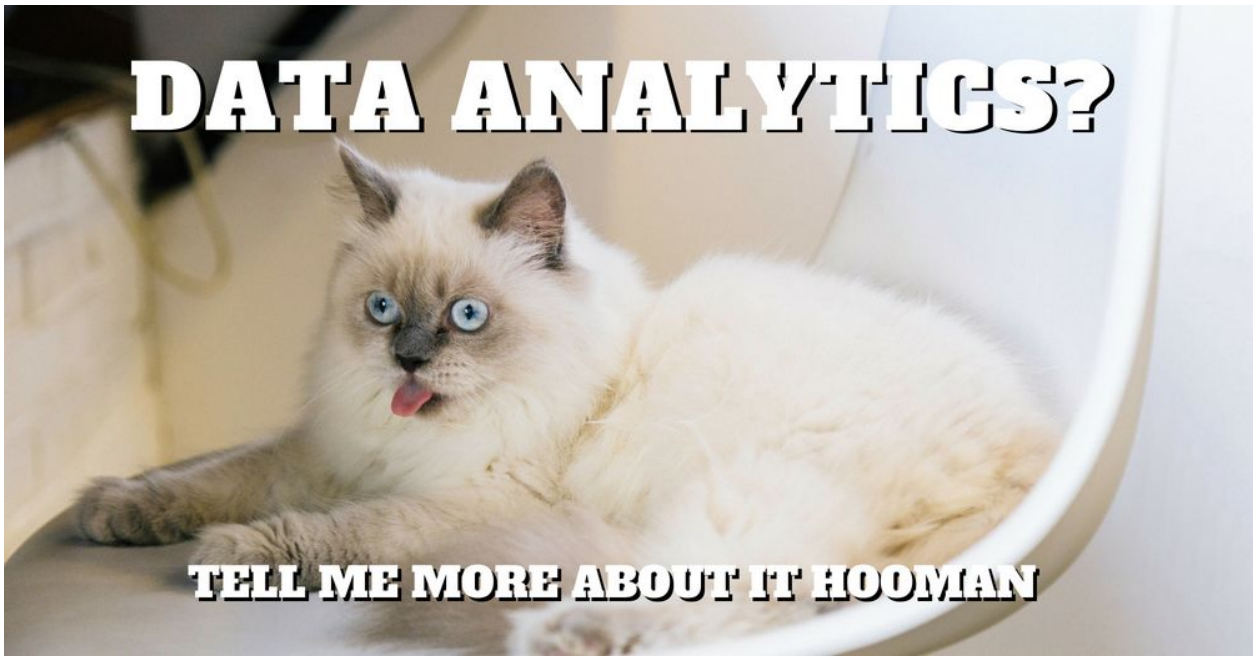
```
In [ ]:

In [35]: lr = LinearRegression()

In [36]: X = df[['adoptable cats','pets','vet']]
         y = df[['coffee']]

In [37]: lr.fit(X,y)

Out[37]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None,
                          normalize=False)

In [39]: predicted = lr.predict(X)

In [58]: f = (predicted - y)['coffee']

In [59]: np.max(predicted)

Out[59]: 7.312979186038094

In [60]: list(f).index(np.max(f))

Out[60]: 302

In [62]: df.iloc[list(f).index(np.max(f))]

Out[62]: zip               77573
         adoptable cats       89
         pets                  7
         vet                   4
         coffee                2
         Name: 302, dtype: int64
```

Once I had a dataframe, I was to determine a score for the fitness of a new cat cafe. Since my cat cafe might be competing with surrounding coffee shops, I needed an area predicted that there SHOULD be a lot but in reality, it does not have a lot of coffee shops, so I can open a coffee shop (with cats!) where there is already a high demand.

I used a linear regression to predict the 'demand' for a coffee shop in each zip code. I trained the model on our training dataset and fed our data through the model to generate predictions for coffee demand in each zip code. I then subtracted the predicted demand from the current number of coffee shops to find the ideal zip code.

```
In [94]: base = "https://api.foursquare.com/v2/"
         command = "venues/search"
         #ll = "40.7,-74"
         query="cats"
         v="20190514"
         z = '77373'
         ll = str(search.by_zipcode(z).lat) + ',' + str(search.by_zipcode(z).lng)
         limit = 50

In [95]: byzip = []

In [96]: for z in houstonzipcodes:
             z = str(z)
             search = SearchEngine(simple_zipcode=True)
             ll = str(search.by_zipcode(z).lat) + ',' + str(search.by_zipcode(z).lng)
             url = base + command + '?' + '&ll=' + ll + '&client_id=' + key + '&client_secret=' + secret + '&query=' + query + '&v=' +

             results = requests.get(url).json()

             if ll == 'None,None':
                 print ('passing' + z)
                 continue

             zipcodes = [x['location']['postalCode'] for x in results['response']['venues'] if 'postalCode' in x['location'].keys()]
             num = zipcodes.count(z)

             byzip.append((z, num))
             print((z,num))

         ('77002', 2)
         ('77003', 0)
         ('77004', 0)
         ('77005', 1)
```

E. Conclusion



Finally, the zip code resulted in 77573, which is the League city area, south Houston, close to the NASA center. This zip code had a high demand for coffee shops, but only currently had two coffee shops within its radius/borders. It also happens that this zip code had a high population of cats, large amount of vets clinics and pet stores. This was a perfect candidate for our new shop! This zip code is also part of Galveston, a small beach island suburb of Houston. It already has a good traffic passing by due to the existing attractions, such as NASA center, restaurants, beach, fishing harbour, etc.

We would be excited to open a cat cafe there!

References:

- [1] Cat café: https://en.wikipedia.org/wiki/Cat_caf%C3%A9
- [2] https://www.thebalancecareers.com/how-to-start-a-cat-cafe-4015007
- [3] Forsquare API
- [4] https://howtostartanllc.com/business-ideas/cat-cafe
- [5] Google Map