wrangle_act

May 24, 2020

1 Project: Data Wrangling of WeRateDogs Tweets

1.1 Table of Contents

1. Gather: In the first step I describe my gathering efforts, incl. loading the file twitter-archive-enhanced.csv, downloading programmatically image_predictions.tsv and storing as well as assessing Twitter API to create tweet_json.txt.
2. Assess: In the secong step I will assess eight (8) quality issues and two (2) tidiness issues.
3. Clean: In the third step I clean the issues, merge the dataframes to a twitter_archive_master.csv and store it.

```
In [278]: %matplotlib inline

          import matplotlib.pyplot as plt
          import numpy as np
          import pandas as pd
          import seaborn as sns
          import requests
          import os
          import tweepy
          import re
```

1.1.1 Gather

1. Read from WeRateDogs Twitter archive: twitter_archive_enhanced.csv.

```
In [279]: twitter_archive = pd.read_csv('twitter-archive-enhanced.csv')
```

2. Get the tweet image predictions, i.e., what breed of dog (or other object, animal, etc.) is present in each tweet according to a neural network. This file (image_predictions.tsv) is hosted on Udacity's servers and should be downloaded programmatically using the Requests library and the following URL: https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predictions/image-predictions.tsv

```
In [280]: #I have to do this only once
          #url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predic
          #r = requests.get(url)
          #r

In [281]: # I have to do this only once
          #with open (os.path.join(url.split('/')[-1]), mode ='wb') as file:
          #       file.write(r.content)

In [282]: image_predictions = pd.read_csv('image-predictions.tsv', delimiter='\t')

In [283]: #delete before sending
          #consumer_key = 'HIDDEN'
          #consumer_secret = 'HIDDEN'
          #access_token = 'HIDDEN'
          #access_secret = 'HIDDEN'

          #auth = tweepy.OAuthHandler(consumer_key, consumer_secret)
          #auth.set_access_token(access_token, access_secret)

          #api = tweepy.API(auth, wait_on_rate_limit=True, wait_on_rate_limit_notify=True, parse

In [284]: #try:
          #     api.verify_credentials()
          #     print("Authentication OK")
          #except:
          #     print("Error during authentication")
```

Extract from tweepy posts for the analysis. The posts have the folling characteristics:

```
In [285]: #tweet_id_list = twitter_archive['tweet_id'].tolist()
          #tweet_texts = {}
          #tweet_errors = {}
          #count = 0

          #for tweet_id in tweet_id_list:
          #     count += 1
          #     try:
          #         tweet = api.get_status(tweet_id, tweet_mode='extended')
          #         tweet_texts[tweet_id] = tweet
          #         print(count, 'success')
          #     except tweepy.TweepError as error:
          #         tweet_errors[tweet_id] = error
          #         print (count, 'fail')

In [286]: #tweet_texts

In [287]: #tweet_info = pd.DataFrame.from_dict(tweet_texts, orient='index')

In [288]: #tweet_info.head()
```

```
In [289]: #tweet_info.to_json(r'tweet_json.txt')

In [290]: #tweet_info.to_json('tweet_info.json')

In [291]: #tweet_info.to_csv('tweet_info.csv', index=False)

In [292]: tweet_info = pd.read_csv('tweet_info.csv')
```

1.1.2 Assess

These issues were found:

- Issue 1: three dataframes instead of one and too much unnecessary data (Tidiness)
- Issue 2: tweet_info - 'id'-column instead of 'tweet_id' (Quality)
- Issue 3: missing values ('tweet_id' in image_predictions vs twitter_archive vs tweet_info) (Quality)
- Issue 4: some of the dog ratings are retweets (Quality)
- Issue 5: twitter_archive: doggo, floofer, pupper, puppo are columns instead of values (Tidiness)
- Issue 6: twitter_archive: Nulls are text and not nulls (puppo, pupper, doggo, floofer column) and many entries are "None" (Quality)
- Issue 7: image_predictions: nondescriptive column headers (p1, p2, p3) (Quality)
- Issue 8: twitter_archive: incoherent values in the rating_denominator(150, 50, 2...) (Quality)
- Issue 9: twitter_archive: rating numerator is int instead of float (Quality)
- Issue 10: twitter_archive: rating numerator is not extracted correcty, e.g. 5 instead of 13.5 in row 46 (Quality)
- Issue 11: twitter_archive: denominator and numerator are in two columns instead of one (Tidiness)
- Issue 12: image_predictions: dog breeds aresometimes lowercase (Quality)
- Issue 13: twitter_archive: dog names are extracted not correctly (Quality)

```
In [293]: pd.set_option('display.max_colwidth', -1)

In [294]: twitter_archive

Out[294]:                    tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
          0     892420643555336193 NaN                       NaN
          1     892177421306343426 NaN                       NaN
          2     891815181378084864 NaN                       NaN
          3     891689557279858688 NaN                       NaN
          4     891327558926688256 NaN                       NaN
          5     891087950875897856 NaN                       NaN
          6     890971913173991426 NaN                       NaN
          7     890729181411237888 NaN                       NaN
          8     890609185150312448 NaN                       NaN
          9     890240255349198849 NaN                       NaN
          10    890006608113172480 NaN                       NaN
          11    889880896479866881 NaN                       NaN
          12    889665388833682689 NaN                       NaN
```

```
13    889638837579907072 NaN                    NaN
14    889531135344209921 NaN                    NaN
15    889278841981685760 NaN                    NaN
16    888917238123831296 NaN                    NaN
17    888804989199671297 NaN                    NaN
18    888554962724278272 NaN                    NaN
19    888202515573088257 NaN                    NaN
20    888078434458587136 NaN                    NaN
21    887705289381826560 NaN                    NaN
22    887517139158093824 NaN                    NaN
23    887473957103951883 NaN                    NaN
24    887343217045368832 NaN                    NaN
25    887101392804085760 NaN                    NaN
26    886983233522544640 NaN                    NaN
27    886736880519319552 NaN                    NaN
28    886680336477933568 NaN                    NaN
29    886366144734445568 NaN                    NaN
...                  ... ..                     ..
2326  666411507551481857 NaN                    NaN
2327  666407126856765440 NaN                    NaN
2328  666396247373291520 NaN                    NaN
2329  666373753744588802 NaN                    NaN
2330  666362758909284353 NaN                    NaN
2331  666353288456101888 NaN                    NaN
2332  666345417576210432 NaN                    NaN
2333  666337882303524864 NaN                    NaN
2334  666293911632134144 NaN                    NaN
2335  666287406224695296 NaN                    NaN
2336  666273097616637952 NaN                    NaN
2337  666268910803644416 NaN                    NaN
2338  666104133288665088 NaN                    NaN
2339  666102155909144576 NaN                    NaN
2340  666099513787052032 NaN                    NaN
2341  666094000022159362 NaN                    NaN
2342  666082916733198337 NaN                    NaN
2343  666073100786774016 NaN                    NaN
2344  666071193221509120 NaN                    NaN
2345  666063827256086533 NaN                    NaN
2346  666058600524156928 NaN                    NaN
2347  666057090499244032 NaN                    NaN
2348  666055525042405380 NaN                    NaN
2349  666051853826850816 NaN                    NaN
2350  666050758794694657 NaN                    NaN
2351  666049248165822465 NaN                    NaN
2352  666044226329800704 NaN                    NaN
2353  666033412701032449 NaN                    NaN
2354  666029285002620928 NaN                    NaN
2355  666020888022790149 NaN                    NaN
```

```
                          timestamp   \
0      2017-08-01 16:23:56 +0000
1      2017-08-01 00:17:27 +0000
2      2017-07-31 00:18:03 +0000
3      2017-07-30 15:58:51 +0000
4      2017-07-29 16:00:24 +0000
5      2017-07-29 00:08:17 +0000
6      2017-07-28 16:27:12 +0000
7      2017-07-28 00:22:40 +0000
8      2017-07-27 16:25:51 +0000
9      2017-07-26 15:59:51 +0000
10     2017-07-26 00:31:25 +0000
11     2017-07-25 16:11:53 +0000
12     2017-07-25 01:55:32 +0000
13     2017-07-25 00:10:02 +0000
14     2017-07-24 17:02:04 +0000
15     2017-07-24 00:19:32 +0000
16     2017-07-23 00:22:39 +0000
17     2017-07-22 16:56:37 +0000
18     2017-07-22 00:23:06 +0000
19     2017-07-21 01:02:36 +0000
20     2017-07-20 16:49:33 +0000
21     2017-07-19 16:06:48 +0000
22     2017-07-19 03:39:09 +0000
23     2017-07-19 00:47:34 +0000
24     2017-07-18 16:08:03 +0000
25     2017-07-18 00:07:08 +0000
26     2017-07-17 16:17:36 +0000
27     2017-07-16 23:58:41 +0000
28     2017-07-16 20:14:00 +0000
29     2017-07-15 23:25:31 +0000
...                         ...
2326   2015-11-17 00:24:19 +0000
2327   2015-11-17 00:06:54 +0000
2328   2015-11-16 23:23:41 +0000
2329   2015-11-16 21:54:18 +0000
2330   2015-11-16 21:10:36 +0000
2331   2015-11-16 20:32:58 +0000
2332   2015-11-16 20:01:42 +0000
2333   2015-11-16 19:31:45 +0000
2334   2015-11-16 16:37:02 +0000
2335   2015-11-16 16:11:11 +0000
2336   2015-11-16 15:14:19 +0000
2337   2015-11-16 14:57:41 +0000
2338   2015-11-16 04:02:55 +0000
2339   2015-11-16 03:55:04 +0000
2340   2015-11-16 03:44:34 +0000
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2341    2015-11-16 03:22:39 +0000
2342    2015-11-16 02:38:37 +0000
2343    2015-11-16 01:59:36 +0000
2344    2015-11-16 01:52:02 +0000
2345    2015-11-16 01:22:45 +0000
2346    2015-11-16 01:01:59 +0000
2347    2015-11-16 00:55:59 +0000
2348    2015-11-16 00:49:46 +0000
2349    2015-11-16 00:35:11 +0000
2350    2015-11-16 00:30:50 +0000
2351    2015-11-16 00:24:50 +0000
2352    2015-11-16 00:04:52 +0000
2353    2015-11-15 23:21:54 +0000
2354    2015-11-15 23:05:30 +0000
2355    2015-11-15 22:32:08 +0000


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0      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
1      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
3      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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29     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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2354    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2355    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</


0       This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut.
1       This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, sh
2       This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass.
3       This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us
4       This is Franklin. He would like you to stop calling him "cute." He is a very fie
5       Here we have a majestic great white breaching off South Africa's coast. Absolute
6       Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax
7       When you watch your owner call another dog a good boy but then they turn back to
8       This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be a
9       This is Cassie. She is a college pup. Studying international doggo communication
10      This is Koda. He is a South Australian deckshark. Deceptively deadly. Frightenin
11      This is Bruno. He is a service shark. Only gets out of the water to assist you.
12      Here's a puppo that seems to be on the fence about something haha no but serious
13      This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 w
14      This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bone
15      This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pl
```

```
16      This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 fo
17      This is Zeke. He has a new stick. Very proud of it. Would like you to throw it f
18      This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirati
19      RT @dog_rates: This is Canela. She attempted some fancy porch pics. They were un
20      This is Gerald. He was just told he didn't get the job he interviewed for. A h*c
21      This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boo
22      I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-ins
23      This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/
24      You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
25      This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
26      This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an env
27      This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but he
28      This is Derek. He's late for a dog meeting. 13/10 pet...al to the metal https://
29      This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Ge
...
2326    This is quite the dog. Gets really excited when not in water. Not very soft tho.
2327    This is a southern Vesuvius bumblegruff. Can drive a truck (wow). Made friends w
2328    Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (
2329    Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEy
2330    Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short leg
2331    Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Bi
2332    Look at this jokester thinking seat belt laws don't apply to him. Great tongue t
2333    This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ver
2334    This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat h
2335    This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood flo
2336    Can take selfies 11/10 https://t.co/ws2AMaNwPW
2337    Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIik
2338    Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpri
2339    Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world is
2340    Can stand on stump for what seems like a while. Built that birdhouse? Impressive
2341    This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confirm
2342    Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1
2343    Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camo
2344    Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good to
2345    This is the happiest dog you will ever see. Very committed owner. Nice couch. 1C
2346    Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drin
2347    My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather dc
2348    Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would d
2349    This is an odd dog. Hard on the outside but loving on the inside. Petting still
2350    This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Priv
2351    Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
2352    This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like h
2353    Here is a very happy pup. Big fan of well-maintained decks. Just look at that tc
2354    This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs he
2355    Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxi

      retweeted_status_id  retweeted_status_user_id  \
0     NaN                  NaN
```

```
1     NaN              NaN
2     NaN              NaN
3     NaN              NaN
4     NaN              NaN
5     NaN              NaN
6     NaN              NaN
7     NaN              NaN
8     NaN              NaN
9     NaN              NaN
10    NaN              NaN
11    NaN              NaN
12    NaN              NaN
13    NaN              NaN
14    NaN              NaN
15    NaN              NaN
16    NaN              NaN
17    NaN              NaN
18    NaN              NaN
19     8.874740e+17       4.196984e+09
20    NaN              NaN
21    NaN              NaN
22    NaN              NaN
23    NaN              NaN
24    NaN              NaN
25    NaN              NaN
26    NaN              NaN
27    NaN              NaN
28    NaN              NaN
29    NaN              NaN
...     ..                ..
2326 NaN              NaN
2327 NaN              NaN
2328 NaN              NaN
2329 NaN              NaN
2330 NaN              NaN
2331 NaN              NaN
2332 NaN              NaN
2333 NaN              NaN
2334 NaN              NaN
2335 NaN              NaN
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2340 NaN              NaN
2341 NaN              NaN
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2344 NaN                    NaN
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2348 NaN                    NaN
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2351 NaN                    NaN
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2353 NaN                    NaN
2354 NaN                    NaN
2355 NaN                    NaN

     retweeted_status_timestamp  \
0       NaN
1       NaN
2       NaN
3       NaN
4       NaN
5       NaN
6       NaN
7       NaN
8       NaN
9       NaN
10      NaN
11      NaN
12      NaN
13      NaN
14      NaN
15      NaN
16      NaN
17      NaN
18      NaN
19      2017-07-19 00:47:34 +0000
20      NaN
21      NaN
22      NaN
23      NaN
24      NaN
25      NaN
26      NaN
27      NaN
28      NaN
29      NaN
...     ...
2326    NaN
2327    NaN
2328    NaN
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2329    NaN
2330    NaN
2331    NaN
2332    NaN
2333    NaN
2334    NaN
2335    NaN
2336    NaN
2337    NaN
2338    NaN
2339    NaN
2340    NaN
2341    NaN
2342    NaN
2343    NaN
2344    NaN
2345    NaN
2346    NaN
2347    NaN
2348    NaN
2349    NaN
2350    NaN
2351    NaN
2352    NaN
2353    NaN
2354    NaN
2355    NaN


0       https://twitter.com/dog_rates/status/892420643555336193/photo/1
1       https://twitter.com/dog_rates/status/892177421306343426/photo/1
2       https://twitter.com/dog_rates/status/891815181378084864/photo/1
3       https://twitter.com/dog_rates/status/891689557279858688/photo/1
4       https://twitter.com/dog_rates/status/891327558926688256/photo/1,https://twitter.
5       https://twitter.com/dog_rates/status/891087950875897856/photo/1
6       https://gofundme.com/ydvmve-surgery-for-jax,https://twitter.com/dog_rates/status
7       https://twitter.com/dog_rates/status/890729181411237888/photo/1,https://twitter.
8       https://twitter.com/dog_rates/status/890609185150312448/photo/1
9       https://twitter.com/dog_rates/status/890240255349198849/photo/1
10      https://twitter.com/dog_rates/status/890006608113172480/photo/1,https://twitter.
11      https://twitter.com/dog_rates/status/889880896479866881/photo/1
12      https://twitter.com/dog_rates/status/889665388333682689/photo/1
13      https://twitter.com/dog_rates/status/889638837579907072/photo/1,https://twitter.
14      https://twitter.com/dog_rates/status/889531135344209921/photo/1
15      https://twitter.com/dog_rates/status/889278841981685760/video/1
16      https://twitter.com/dog_rates/status/888917238123831296/photo/1
17      https://twitter.com/dog_rates/status/888804989199671297/photo/1,https://twitter.
18      https://twitter.com/dog_rates/status/888554962724278272/photo/1,https://twitter.
```

```
19    https://twitter.com/dog_rates/status/887473957103951883/photo/1,https://twitter.
20    https://twitter.com/dog_rates/status/888078434458587136/photo/1,https://twitter.
21    https://twitter.com/dog_rates/status/887705289381826560/photo/1
22    https://twitter.com/dog_rates/status/887517139158093824/video/1
23    https://twitter.com/dog_rates/status/887473957103951883/photo/1,https://twitter.
24    https://twitter.com/dog_rates/status/887343217045368832/video/1
25    https://twitter.com/dog_rates/status/887101392804085760/photo/1
26    https://twitter.com/dog_rates/status/886983233522544640/photo/1,https://twitter.
27    https://www.gofundme.com/mingusneedsus,https://twitter.com/dog_rates/status/8867
28    https://twitter.com/dog_rates/status/886680336477933568/photo/1
29    https://twitter.com/dog_rates/status/886366144734445568/photo/1,https://twitter.
...
2326  https://twitter.com/dog_rates/status/666411507551481857/photo/1
2327  https://twitter.com/dog_rates/status/666407126856765440/photo/1
2328  https://twitter.com/dog_rates/status/666396247373291520/photo/1
2329  https://twitter.com/dog_rates/status/666373753744588802/photo/1
2330  https://twitter.com/dog_rates/status/666362758909284353/photo/1
2331  https://twitter.com/dog_rates/status/666353288456101888/photo/1
2332  https://twitter.com/dog_rates/status/666345417576210432/photo/1
2333  https://twitter.com/dog_rates/status/666337882303524864/photo/1
2334  https://twitter.com/dog_rates/status/666293911632134144/photo/1
2335  https://twitter.com/dog_rates/status/666287406224695296/photo/1
2336  https://twitter.com/dog_rates/status/666273097616637952/photo/1
2337  https://twitter.com/dog_rates/status/666268910803644416/photo/1
2338  https://twitter.com/dog_rates/status/666104133288665088/photo/1
2339  https://twitter.com/dog_rates/status/666102155909144576/photo/1
2340  https://twitter.com/dog_rates/status/666099513787052032/photo/1
2341  https://twitter.com/dog_rates/status/666094000022159362/photo/1
2342  https://twitter.com/dog_rates/status/666082916733198337/photo/1
2343  https://twitter.com/dog_rates/status/666073100786774016/photo/1
2344  https://twitter.com/dog_rates/status/666071193221509120/photo/1
2345  https://twitter.com/dog_rates/status/666063827256086533/photo/1
2346  https://twitter.com/dog_rates/status/666058600524156928/photo/1
2347  https://twitter.com/dog_rates/status/666057090499244032/photo/1
2348  https://twitter.com/dog_rates/status/666055525042405380/photo/1
2349  https://twitter.com/dog_rates/status/666051853826850816/photo/1
2350  https://twitter.com/dog_rates/status/666050758794694657/photo/1
2351  https://twitter.com/dog_rates/status/666049248165822465/photo/1
2352  https://twitter.com/dog_rates/status/666044226329800704/photo/1
2353  https://twitter.com/dog_rates/status/666033412701032449/photo/1
2354  https://twitter.com/dog_rates/status/666029285002620928/photo/1
2355  https://twitter.com/dog_rates/status/666020888022790149/photo/1
```

```
     rating_numerator  rating_denominator      name  doggo floofer  pupper  \
0    13                10                    Phineas  None  None     None
1    13                10                    Tilly    None  None     None
2    12                10                    Archie   None  None     None
3    13                10                    Darla    None  None     None
```

4	12	10	Franklin	None	None	None
5	13	10	None	None	None	None
6	13	10	Jax	None	None	None
7	13	10	None	None	None	None
8	13	10	Zoey	None	None	None
9	14	10	Cassie	doggo	None	None
10	13	10	Koda	None	None	None
11	13	10	Bruno	None	None	None
12	13	10	None	None	None	None
13	12	10	Ted	None	None	None
14	13	10	Stuart	None	None	None
15	13	10	Oliver	None	None	None
16	12	10	Jim	None	None	None
17	13	10	Zeke	None	None	None
18	13	10	Ralphus	None	None	None
19	13	10	Canela	None	None	None
20	12	10	Gerald	None	None	None
21	13	10	Jeffrey	None	None	None
22	14	10	such	None	None	None
23	13	10	Canela	None	None	None
24	13	10	None	None	None	None
25	12	10	None	None	None	None
26	13	10	Maya	None	None	None
27	13	10	Mingus	None	None	None
28	13	10	Derek	None	None	None
29	12	10	Roscoe	None	None	pupper
...	..	..	...	...	...	...
2326	2	10	quite	None	None	None
2327	7	10	a	None	None	None
2328	9	10	None	None	None	None
2329	11	10	None	None	None	None
2330	6	10	None	None	None	None
2331	8	10	None	None	None	None
2332	10	10	None	None	None	None
2333	9	10	an	None	None	None
2334	3	10	a	None	None	None
2335	1	2	an	None	None	None
2336	11	10	None	None	None	None
2337	10	10	None	None	None	None
2338	1	10	None	None	None	None
2339	11	10	None	None	None	None
2340	8	10	None	None	None	None
2341	9	10	None	None	None	None
2342	6	10	None	None	None	None
2343	10	10	None	None	None	None
2344	9	10	None	None	None	None
2345	10	10	the	None	None	None
2346	8	10	the	None	None	None

2347	9	10	a	None	None	None
2348	10	10	a	None	None	None
2349	2	10	an	None	None	None
2350	10	10	a	None	None	None
2351	5	10	None	None	None	None
2352	6	10	a	None	None	None
2353	9	10	a	None	None	None
2354	7	10	a	None	None	None
2355	8	10	None	None	None	None

	puppo
0	None
1	None
2	None
3	None
4	None
5	None
6	None
7	None
8	None
9	None
10	None
11	None
12	puppo
13	None
14	puppo
15	None
16	None
17	None
18	None
19	None
20	None
21	None
22	None
23	None
24	None
25	None
26	None
27	None
28	None
29	None
...	...
2326	None
2327	None
2328	None
2329	None
2330	None
2331	None

```
        2332   None
        2333   None
        2334   None
        2335   None
        2336   None
        2337   None
        2338   None
        2339   None
        2340   None
        2341   None
        2342   None
        2343   None
        2344   None
        2345   None
        2346   None
        2347   None
        2348   None
        2349   None
        2350   None
        2351   None
        2352   None
        2353   None
        2354   None
        2355   None

        [2356 rows x 17 columns]

In [295]: twitter_archive.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
tweet_id                     2356 non-null int64
in_reply_to_status_id        78 non-null float64
in_reply_to_user_id          78 non-null float64
timestamp                    2356 non-null object
source                       2356 non-null object
text                         2356 non-null object
retweeted_status_id          181 non-null float64
retweeted_status_user_id     181 non-null float64
retweeted_status_timestamp   181 non-null object
expanded_urls                2297 non-null object
rating_numerator             2356 non-null int64
rating_denominator           2356 non-null int64
name                         2356 non-null object
doggo                        2356 non-null object
floofer                      2356 non-null object
pupper                       2356 non-null object
```

```
puppo                              2356 non-null object
dtypes: float64(4), int64(3), object(10)
memory usage: 313.0+ KB


In [296]: twitter_archive['rating_denominator'].unique()

Out[296]: array([ 10,   0,  15,  70,   7,  11, 150, 170,  20,  50,  90,  80,  40,
                  130, 110,  16, 120,   2])

In [297]: twitter_archive['doggo'].value_counts(),

Out[297]: (None     2259
           doggo      97
            Name: doggo, dtype: int64,)

In [298]: twitter_archive['puppo'].value_counts()

Out[298]: None      2326
          puppo       30
          Name: puppo, dtype: int64

In [299]: twitter_archive['floofer'].value_counts()

Out[299]: None       2346
          floofer      10
          Name: floofer, dtype: int64

In [300]: twitter_archive['pupper'].value_counts()

Out[300]: None      2099
          pupper     257
          Name: pupper, dtype: int64

In [301]: df_show = twitter_archive[twitter_archive['rating_denominator'] == 150]
          df_show

Out[301]:                 tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
          902   758467244762497024 NaN                    NaN

                                   timestamp  \
          902   2016-07-28 01:00:57 +0000

                                                                            sourc
          902   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a

                                                                            text  \
          902   Why does this never happen at my front door... 165/150 https://t.co/HmwrdfEfUE

                  retweeted_status_id  retweeted_status_user_id retweeted_status_timestamp  \
```

```
      902 NaN                     NaN                          NaN

                                                             expanded_urls  \
      902  https://twitter.com/dog_rates/status/758467244762497024/video/1

           rating_numerator  rating_denominator  name doggo floofer pupper puppo
      902  165               150                 None  None  None    None   None

In [302]: twitter_archive['retweeted_status_id'].unique()

Out[302]: array([              nan,   8.87473957e+17,   8.86053734e+17,
                  8.30583321e+17,   8.78057613e+17,   8.78281511e+17,
                  6.69000397e+17,   8.76850772e+17,   8.66334965e+17,
                  8.68880398e+17,   8.73213776e+17,   8.72657584e+17,
                  8.41077006e+17,   8.59196979e+17,   8.68552279e+17,
                  8.65013420e+17,   8.66450706e+17,   8.37820168e+17,
                  8.63062472e+17,   8.06629075e+17,   8.60563773e+17,
                  8.60914485e+17,   7.61672994e+17,   8.39549326e+17,
                  8.57061112e+17,   8.44704788e+17,   8.56330159e+17,
                  8.42163533e+17,   8.55122533e+17,   8.31650052e+17,
                  8.29374342e+17,   8.48289382e+17,   8.33124695e+17,
                  8.32369877e+17,   8.47971000e+17,   7.56288534e+17,
                  7.73308824e+17,   8.07106841e+17,   8.17423860e+17,
                  8.40632337e+17,   6.67152164e+17,   8.39289919e+17,
                  8.38905981e+17,   7.83839966e+17,   8.20749717e+17,
                  8.37011345e+17,   8.36648149e+17,   8.17827839e+17,
                  7.86963064e+17,   8.35264099e+17,   7.53039831e+17,
                  8.29501995e+17,   8.32434358e+17,   8.32766382e+17,
                  7.86709083e+17,   7.93286476e+17,   7.69940426e+17,
                  8.09220051e+17,   8.26958653e+17,   8.10254108e+17,
                  6.94669722e+17,   8.09920764e+17,   8.25026591e+17,
                  7.95076730e+17,   7.84057940e+17,   8.22244817e+17,
                  8.22489057e+17,   7.86233965e+17,   7.80601304e+17,
                  7.82305868e+17,   8.19227688e+17,   8.20314634e+17,
                  8.00141422e+17,   8.19952236e+17,   8.19004803e+17,
                  8.19006401e+17,   8.08344866e+17,   7.73547597e+17,
                  8.16450571e+17,   6.92417313e+17,   8.15966073e+17,
                  7.90946056e+17,   8.15990721e+17,   7.32005617e+17,
                  7.91406956e+17,   6.98195409e+17,   7.90277117e+17,
                  6.80055456e+17,   7.93962222e+17,   8.01167903e+17,
                  7.82969140e+17,   7.81524693e+17,   7.83334640e+17,
                  7.82722599e+17,   7.84183166e+17,   7.84826020e+17,
                  6.91416866e+17,   7.67754930e+17,   7.77684234e+17,
                  7.79056096e+17,   8.00065028e+17,   7.75733305e+17,
                  8.00854023e+17,   7.76113306e+17,   6.81694086e+17,
                  7.75085133e+17,   7.74314404e+17,   7.40676976e+17,
                  7.18631498e+17,   7.12809026e+17,   7.01214701e+17,
                  6.83391853e+17,   6.76936542e+17,   6.75501076e+17,
```

```
                6.71896809e+17,   6.70444956e+17,   6.67509364e+17,
                6.67182792e+17,   6.66104133e+17,   7.71770457e+17,
                6.87317306e+17,   7.80931614e+17,   7.96149749e+17,
                7.89530877e+17,   7.88765915e+17,   7.91672323e+17,
                6.84830983e+17,   6.82088079e+17,   7.46757706e+17,
                7.63837566e+17,   7.89986466e+17,   7.62699858e+17,
                7.62464539e+17,   7.50719633e+17,   7.36392552e+17,
                7.61004548e+17,   7.52932433e+17,   7.59447682e+17,
                7.79834333e+17,   6.74291837e+17,   7.07610949e+17,
                7.42423170e+17,   7.80465709e+17,   7.53375669e+17,
                6.79462823e+17,   7.58099636e+17,   7.03041950e+17,
                7.68193405e+17,   7.50429298e+17,   6.79828447e+17,
                7.00747789e+17,   7.33109485e+17,   7.40373189e+17,
                7.71380798e+17,   7.65222099e+17,   6.73320133e+17,
                7.71002130e+17,   7.39238158e+17,   7.41067307e+17,
                7.06904524e+17,   7.00143752e+17,   7.39979192e+17,
                7.59923799e+17,   7.25842289e+17,   6.73295269e+17,
                6.85325113e+17,   7.11694788e+17,   7.60153833e+17,
                7.39544079e+17,   6.70319131e+17,   6.79062614e+17,
                7.57597141e+17,   6.79158374e+17,   6.81523178e+17,
                6.83515932e+17,   6.75354436e+17,   7.04761121e+17,
                6.67866724e+17,   6.67138270e+17,   7.11998280e+17,
                6.67548696e+17,   6.67548415e+17])
```

In [303]: retweet_ids = twitter_archive[twitter_archive['retweeted_status_id']> 0]
          retweet_ids

Out[303]:   tweet_id in_reply_to_status_id in_reply_to_user_id \
          19   888202515573088257 NaN   NaN
          32   886054160059072513 NaN   NaN
          36   885311592912609280 NaN   NaN
          68   879130579576475649 NaN   NaN
          73   878404777348136964 NaN   NaN
          74   878316110768087041 NaN   NaN
          78   877611172832227328 NaN   NaN
          91   874434818259525634 NaN   NaN
          95   873697596434513921 NaN   NaN
          97   873337748698140672 NaN   NaN
          101   872668790621863937 NaN   NaN
          109   871166179821445120 NaN   NaN
          118   869988702071779329 NaN   NaN
          124   868639477480148993 NaN   NaN
          130   867072653475098625 NaN   NaN
          132   866816280283807744 NaN   NaN
          137   866094527597207552 NaN   NaN
          146   863471782782697472 NaN   NaN
          155   861769973181624320 NaN   NaN
          159   860981674716409858 NaN   NaN

```
160   860924035999428608 NaN              NaN
165   860177593139703809 NaN              NaN
171   858860390427611136 NaN              NaN
180   857062103051644929 NaN              NaN
182   856602993587888130 NaN              NaN
185   856330835276025856 NaN              NaN
194   855245323840757760 NaN              NaN
195   855138241867124737 NaN              NaN
204   852936405516943360 NaN              NaN
211   851953902622658560 NaN              NaN
...                  ...  ..               ..
784   775096608509886464 NaN              NaN
794   773336787167145985 NaN              NaN
800   772615324260794368 NaN              NaN
811   771171053431250945 NaN              NaN
815   771004394259247104 NaN              NaN
818   770743923962707968 NaN              NaN
822   770093767776997377 NaN              NaN
826   769335591808995329 NaN              NaN
829   768909767477751808 NaN              NaN
833   768554158521745409 NaN              NaN
841   768864461642756096 NaN              NaN
847   766078092750233600 NaN              NaN
860   763167063695355904 NaN              NaN
868   761750502866649088 NaN              NaN
872   761371037149827077 NaN              NaN
885   760153949710192640 NaN              NaN
890   759566828574212096 NaN              NaN
895   759159934323924993 NaN              NaN
908   757729163776290825 NaN              NaN
911   757597904299253760 NaN              NaN
926   754874841593970688 NaN              NaN
937   753298634498793472 NaN              NaN
943   752701944171524096 NaN              NaN
949   752309394570878976 NaN              NaN
1012  747242308580548608 NaN              NaN
1023  746521445350707200 NaN              NaN
1043  743835915802583040 NaN              NaN
1242  711998809858043904 NaN              NaN
2259  667550904950915073 NaN              NaN
2260  667550882905632768 NaN              NaN

                    timestamp  \
19    2017-07-21 01:02:36 +0000
32    2017-07-15 02:45:48 +0000
36    2017-07-13 01:35:06 +0000
68    2017-06-26 00:13:58 +0000
73    2017-06-24 00:09:53 +0000
```

```
74      2017-06-23 18:17:33 +0000
78      2017-06-21 19:36:23 +0000
91      2017-06-13 01:14:41 +0000
95      2017-06-11 00:25:14 +0000
97      2017-06-10 00:35:19 +0000
101     2017-06-08 04:17:07 +0000
109     2017-06-04 00:46:17 +0000
118     2017-05-31 18:47:24 +0000
124     2017-05-28 01:26:04 +0000
130     2017-05-23 17:40:04 +0000
132     2017-05-23 00:41:20 +0000
137     2017-05-21 00:53:21 +0000
146     2017-05-13 19:11:30 +0000
155     2017-05-09 02:29:07 +0000
159     2017-05-06 22:16:42 +0000
160     2017-05-06 18:27:40 +0000
165     2017-05-04 17:01:34 +0000
171     2017-05-01 01:47:28 +0000
180     2017-04-26 02:41:43 +0000
182     2017-04-24 20:17:23 +0000
185     2017-04-24 02:15:55 +0000
194     2017-04-21 02:22:29 +0000
195     2017-04-20 19:16:59 +0000
204     2017-04-14 17:27:40 +0000
211     2017-04-12 00:23:33 +0000
...                         ...
784     2016-09-11 22:20:06 +0000
794     2016-09-07 01:47:12 +0000
800     2016-09-05 02:00:22 +0000
811     2016-09-01 02:21:21 +0000
815     2016-08-31 15:19:06 +0000
818     2016-08-30 22:04:05 +0000
822     2016-08-29 03:00:36 +0000
826     2016-08-27 00:47:53 +0000
829     2016-08-25 20:35:48 +0000
833     2016-08-24 21:02:45 +0000
841     2016-08-20 05:08:29 +0000
847     2016-08-18 01:03:45 +0000
860     2016-08-10 00:16:21 +0000
868     2016-08-06 02:27:27 +0000
872     2016-08-05 01:19:35 +0000
885     2016-08-01 16:43:19 +0000
890     2016-07-31 01:50:18 +0000
895     2016-07-29 22:53:27 +0000
908     2016-07-26 00:08:05 +0000
911     2016-07-25 15:26:30 +0000
926     2016-07-18 03:06:01 +0000
937     2016-07-13 18:42:44 +0000
```

```
943   2016-07-12 03:11:42 +0000
949   2016-07-11 01:11:51 +0000
1012  2016-06-27 01:37:04 +0000
1023  2016-06-25 01:52:36 +0000
1043  2016-06-17 16:01:16 +0000
1242  2016-03-21 19:31:59 +0000
2259  2015-11-20 03:51:52 +0000
2260  2015-11-20 03:51:47 +0000


                                                                                          sour
19    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
32    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
36    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
68    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
73    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
74    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
78    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
91    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
95    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
97    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
101   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
109   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
118   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
124   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
130   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
132   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
137   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
146   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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195   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
204   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
211   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
...                                                                                        .
784   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
794   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
800   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
811   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
815   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
818   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
822   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
```

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826   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
829   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
833   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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860   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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885   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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895   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
908   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
911   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
926   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
937   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
943   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
949   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
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1043  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
1242  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2259  <a href="http://twitter.com" rel="nofollow">Twitter Web Client</a>
2260  <a href="http://twitter.com" rel="nofollow">Twitter Web Client</a>



19    RT @dog_rates: This is Canela. She attempted some fancy porch pics. They were un
32    RT @Athletics: 12/10 #BATP https://t.co/WxwJmvjfxo
36    RT @dog_rates: This is Lilly. She just parallel barked. Kindly requests a reward
68    RT @dog_rates: This is Emmy. She was adopted today. Massive round of pupplause f
73    RT @dog_rates: Meet Shadow. In an attempt to reach maximum zooming borkdrive, he
74    RT @dog_rates: Meet Terrance. He's being yelled at because he stapled the wrong
78    RT @rachel2195: @dog_rates the boyfriend and his soaking wet pupper h*cking love
91    RT @dog_rates: This is Coco. At first I thought she was a cloud but clouds don't
95    RT @dog_rates: This is Walter. He won't start hydrotherapy without his favorite
97    RT @dog_rates: This is Sierra. She's one precious pupper. Absolute 12/10. Been i
101   RT @loganamnosis: Penelope here is doing me quite a divertir. Well done, @dog_ra
109   RT @dog_rates: This is Dawn. She's just checking pup on you. Making sure you're
118   RT @dog_rates: We only rate dogs. This is quite clearly a smol broken polar bear
124   RT @dog_rates: Say hello to Cooper. His expression is the same wet or dry. Absol
130   RT @rachaeleasler: these @dog_rates hats are 13/10 bean approved https://t.co/nR
132   RT @dog_rates: This is Jamesy. He gives a kiss to every other pupper he sees on
137   RT @dog_rates: Here's a pupper before and after being asked "who's a good girl?"
146   RT @dog_rates: Say hello to Quinn. She's quite the goofball. Not even a year old
155   RT @dog_rates: "Good afternoon class today we're going to learn what makes a goo
159   RT @dog_rates: Meet Lorenzo. He's an avid nifty hat wearer and absolute 13/10, b
160   RT @tallylott: h*ckin adorable promposal. 13/10 @dog_rates https://t.co/6n8hzNih
165   RT @dog_rates: Ohboyohboyohboyohboyohboyohboyohboyohboyohboyohboyohboyohboyohboy
171   RT @dog_rates: Meet Winston. He knows he's a little too big for the swing, but h
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180    RT @AaronChewning: First time wearing my @dog_rates hat on a flight and I get DC
182    RT @dog_rates: This is Luna. It's her first time outside and a bee stung her nos
185    RT @Jenna_Marbles: @dog_rates Thanks for rating my cermets 14/10 wow I'm so prou
194    RT @dog_rates: Meet George. He looks slightly deflated but overall quite powerfu
195    RT @frasercampbell_: oh my... what's that... beautiful scarf around your neck...
204    RT @dog_rates: I usually only share these on Friday's, but this is Blue. He's a
211    RT @dog_rates: This is Astrid. She's a guide doggo in training. 13/10 would foll
...
784    RT @dog_rates: After so many requests, this is Bretagne. She was the last surviv
794    RT @dog_rates: Meet Fizz. She thinks love is a social construct consisting solel
800    RT @dog_rates: This is Gromit. He's pupset because there's no need to beware of
811    RT @dog_rates: This is Frankie. He's wearing blush. 11/10 really accents the che
815    RT @katieornah: @dog_rates learning a lot at college 12/10 for my professor than
818    RT @dog_rates: Here's a doggo blowing bubbles. It's downright legendary. 13/10 w
822    RT @dog_rates: This is just downright precious af. 12/10 for both pupper and dog
826    RT @dog_rates: Ever seen a dog pet another dog? Both 13/10 truly an awe-inspirin
829    RT @dog_rates: When it's Janet from accounting's birthday but you can't eat the
833    RT @dog_rates: This is Nollie. She's waving at you. If you don't wave back you'r
841    RT @dog_rates: We only rate dogs... this is a Taiwanese Guide Walrus. Im getting
847    RT @dog_rates: This is Colby. He's currently regretting all those times he shook
860    RT @dog_rates: Meet Eve. She's a raging alcoholic 8/10 (would b 11/10 but pupper
868    RT @dog_rates: "Tristan do not speak to me with that kind of tone or I will take
872    RT @dog_rates: Oh. My. God. 13/10 magical af https://t.co/Ezu6jQrKAZ
885    RT @hownottodraw: The story/person behind @dog_rates is heckin adorable af. 11/1
890    RT @dog_rates: This... is a Tyrannosaurus rex. We only rate dogs. Please only se
895    RT @dog_rates: AT DAWN...\nWE RIDE\n\n11/10 https://t.co/QnfO7HEQGA
908    RT @dog_rates: This is Chompsky. He lives up to his name. 11/10 https://t.co/Xl3
911    RT @jon_hill987: @dog_rates There is a cunningly disguised pupper here mate! 11/
926    RT @dog_rates: This is Rubio. He has too much skin. 11/10 https://t.co/NLOHmlENa
937    RT @dog_rates: This is Carly. She's actually 2 dogs fused together. Very innovat
943    RT @dog_rates: HEY PUP WHAT'S THE PART OF THE HUMAN BODY THAT CONNECTS THE FOOT
949    RT @dog_rates: Everyone needs to watch this. 13/10 https://t.co/Bb3xnpsWBC
1012   RT @dog_rates: This pupper killed this great white in an epic sea battle. Now we
1023   RT @dog_rates: This is Shaggy. He knows exactly how to solve the puzzle but can'
1043   RT @dog_rates: Extremely intelligent dog here. Has learned to walk like human. E
1242   RT @twitter: @dog_rates Awesome Tweet! 12/10. Would Retweet. #LoveTwitter https:
2259   RT @dogratingrating: Exceptional talent. Original humor. Cutting edge, Nova Scot
2260   RT @dogratingrating: Unoriginal idea. Blatant plagiarism. Curious grammar. -5/10

      retweeted_status_id  retweeted_status_user_id  \
19            8.874740e+17              4.196984e+09
32            8.860537e+17              1.960740e+07
36            8.305833e+17              4.196984e+09
68            8.780576e+17              4.196984e+09
73            8.782815e+17              4.196984e+09
74            6.690004e+17              4.196984e+09
78            8.768508e+17              5.128045e+08
91            8.663350e+17              4.196984e+09
```

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95     8.688804e+17        4.196984e+09
97     8.732138e+17        4.196984e+09
101    8.726576e+17        1.547674e+08
109    8.410770e+17        4.196984e+09
118    8.591970e+17        4.196984e+09
124    8.685523e+17        4.196984e+09
130    8.650134e+17        7.874618e+17
132    8.664507e+17        4.196984e+09
137    8.378202e+17        4.196984e+09
146    8.630625e+17        4.196984e+09
155    8.066291e+17        4.196984e+09
159    8.605638e+17        4.196984e+09
160    8.609145e+17        3.638908e+08
165    7.616730e+17        4.196984e+09
171    8.395493e+17        4.196984e+09
180    8.570611e+17        5.870972e+07
182    8.447048e+17        4.196984e+09
185    8.563302e+17        6.669901e+07
194    8.421635e+17        4.196984e+09
195    8.551225e+17        7.475543e+17
204    8.316501e+17        4.196984e+09
211    8.293743e+17        4.196984e+09
...         ...                 ...
784    7.403732e+17        4.196984e+09
794    7.713808e+17        4.196984e+09
800    7.652221e+17        4.196984e+09
811    6.733201e+17        4.196984e+09
815    7.710021e+17        1.732729e+09
818    7.392382e+17        4.196984e+09
822    7.410673e+17        4.196984e+09
826    7.069045e+17        4.196984e+09
829    7.001438e+17        4.196984e+09
833    7.399792e+17        4.196984e+09
841    7.599238e+17        4.196984e+09
847    7.258423e+17        4.196984e+09
860    6.732953e+17        4.196984e+09
868    6.853251e+17        4.196984e+09
872    7.116948e+17        4.196984e+09
885    7.601538e+17        1.950368e+08
890    7.395441e+17        4.196984e+09
895    6.703191e+17        4.196984e+09
908    6.790626e+17        4.196984e+09
911    7.575971e+17        2.804798e+08
926    6.791584e+17        4.196984e+09
937    6.815232e+17        4.196984e+09
943    6.835159e+17        4.196984e+09
949    6.753544e+17        4.196984e+09
1012   7.047611e+17        4.196984e+09
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1023   6.678667e+17           4.196984e+09
1043   6.671383e+17           4.196984e+09
1242   7.119983e+17           7.832140e+05
2259   6.675487e+17           4.296832e+09
2260   6.675484e+17           4.296832e+09


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19      2017-07-19 00:47:34 +0000
32      2017-07-15 02:44:07 +0000
36      2017-02-12 01:04:29 +0000
68      2017-06-23 01:10:23 +0000
73      2017-06-23 16:00:04 +0000
74      2015-11-24 03:51:38 +0000
78      2017-06-19 17:14:49 +0000
91      2017-05-21 16:48:45 +0000
95      2017-05-28 17:23:24 +0000
97      2017-06-09 16:22:42 +0000
101     2017-06-08 03:32:35 +0000
109     2017-03-13 00:02:39 +0000
118     2017-05-02 00:04:57 +0000
124     2017-05-27 19:39:34 +0000
130     2017-05-18 01:17:25 +0000
132     2017-05-22 00:28:40 +0000
137     2017-03-04 00:21:08 +0000
146     2017-05-12 16:05:02 +0000
155     2016-12-07 22:38:52 +0000
159     2017-05-05 18:36:06 +0000
160     2017-05-06 17:49:42 +0000
165     2016-08-05 21:19:27 +0000
171     2017-03-08 18:52:12 +0000
180     2017-04-26 02:37:47 +0000
182     2017-03-23 00:18:10 +0000
185     2017-04-24 02:13:14 +0000
194     2017-03-16 00:00:07 +0000
195     2017-04-20 18:14:33 +0000
204     2017-02-14 23:43:18 +0000
211     2017-02-08 17:00:26 +0000
...                        ...
784     2016-06-08 02:41:38 +0000
794     2016-09-01 16:14:48 +0000
800     2016-08-15 16:22:20 +0000
811     2015-12-06 01:56:44 +0000
815     2016-08-31 15:10:07 +0000
818     2016-06-04 23:31:25 +0000
822     2016-06-10 00:39:48 +0000
826     2016-03-07 18:09:06 +0000
829     2016-02-18 02:24:13 +0000
833     2016-06-07 00:36:02 +0000
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847    2016-04-29 00:21:01 +0000
860    2015-12-06 00:17:55 +0000
868    2016-01-08 05:00:14 +0000
872    2016-03-20 23:23:54 +0000
885    2016-08-01 16:42:51 +0000
890    2016-06-05 19:47:03 +0000
895    2015-11-27 19:11:49 +0000
908    2015-12-21 22:15:18 +0000
911    2016-07-25 15:23:28 +0000
926    2015-12-22 04:35:49 +0000
937    2015-12-28 17:12:42 +0000
943    2016-01-03 05:11:12 +0000
949    2015-12-11 16:40:19 +0000
1012   2016-03-01 20:11:59 +0000
1023   2015-11-21 00:46:50 +0000
1043   2015-11-19 00:32:12 +0000
1242   2016-03-21 19:29:52 +0000
2259   2015-11-20 03:43:06 +0000
2260   2015-11-20 03:41:59 +0000



19     https://twitter.com/dog_rates/status/887473957103951883/photo/1,https://twitter.
32     https://twitter.com/dog_rates/status/886053434075471873,https://twitter.com/dog_
36     https://twitter.com/dog_rates/status/830583320585068544/photo/1,https://twitter.
68     https://twitter.com/dog_rates/status/878057613040115712/photo/1,https://twitter.
73     https://www.gofundme.com/3yd6y1c,https://twitter.com/dog_rates/status/8782815110
74     https://twitter.com/dog_rates/status/669000397445533696/photo/1
78     https://twitter.com/rachel2195/status/876850772322988033/photo/1,https://twitter
91     https://twitter.com/dog_rates/status/866334964761202691/photo/1,https://twitter.
95     https://twitter.com/dog_rates/status/868880397819494401/photo/1,https://twitter.
97     https://www.gofundme.com/help-my-baby-sierra-get-better,https://twitter.com/dog_
101    https://twitter.com/loganamnosis/status/872657584259551233/photo/1
109    https://twitter.com/dog_rates/status/841077006473256960/photo/1
118    https://twitter.com/dog_rates/status/859196978902773760/video/1
124    https://www.gofundme.com/3ti3nps,https://twitter.com/dog_rates/status/8685522785
130    https://twitter.com/rachaeleasler/status/865013420445368320/photo/1,https://twit
132    https://twitter.com/dog_rates/status/866450705531457537/photo/1,https://twitter.
137    https://twitter.com/dog_rates/status/837820167694528512/photo/1,https://twitter.
146    https://www.gofundme.com/helpquinny,https://twitter.com/dog_rates/status/8630624
155    https://twitter.com/dog_rates/status/806629075125202948/photo/1,https://twitter.
159    https://www.gofundme.com/help-lorenzo-beat-cancer,https://twitter.com/dog_rates/
160    https://twitter.com/tallylott/status/860914485250469888/photo/1,https://twitter.
165    https://twitter.com/dog_rates/status/761672994376806400/video/1
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185    NaN
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194    https://twitter.com/dog_rates/status/842163532590374912/photo/1,https://twitter.
195    https://twitter.com/frasercampbell_/status/855122533267460096/photo/1
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211    https://twitter.com/dog_rates/status/829374341691346946/photo/1,https://twitter.
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784    https://twitter.com/dog_rates/status/740373189193256964/photo/1,https://twitter.
794    https://twitter.com/dog_rates/status/771380798096281600/photo/1,https://twitter.
800    https://twitter.com/dog_rates/status/765222098633691136/photo/1,https://twitter.
811    https://twitter.com/dog_rates/status/673320132811366400/photo/1,https://twitter.
815    https://twitter.com/katieornah/status/771002130450743296/photo/1,https://twitter
818    https://twitter.com/dog_rates/status/739238157791694849/video/1
822    https://twitter.com/dog_rates/status/741067306818797568/photo/1,https://twitter.
826    https://vine.co/v/iXQAm5Lrgrh,https://vine.co/v/iXQAm5Lrgrh
829    https://twitter.com/dog_rates/status/700143752053182464/photo/1
833    https://twitter.com/dog_rates/status/739979191639244800/photo/1
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847    https://twitter.com/dog_rates/status/725842289046749185/photo/1,https://twitter.
860    https://twitter.com/dog_rates/status/673295268553605120/photo/1
868    https://twitter.com/dog_rates/status/685325112850124800/photo/1,https://twitter.
872    https://twitter.com/dog_rates/status/711694788429553666/photo/1,https://twitter.
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908    https://twitter.com/dog_rates/status/679062614270468097/photo/1,https://twitter.
911    https://twitter.com/jon_hill987/status/757597141099548672/photo/1,https://twitte
926    https://twitter.com/dog_rates/status/679158373988876288/photo/1,https://twitter.
937    https://twitter.com/dog_rates/status/681523177663676416/photo/1
943    https://vine.co/v/ibvnzrauFuV,https://vine.co/v/ibvnzrauFuV
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1012   https://twitter.com/dog_rates/status/704761120771465216/photo/1,https://twitter.
1023   https://twitter.com/dog_rates/status/667866724293877760/photo/1
1043   https://twitter.com/dog_rates/status/667138269671505920/photo/1
1242   https://twitter.com/twitter/status/711998279773347841/photo/1,https://twitter.co
2259   https://twitter.com/dogratingrating/status/667548695664070656/photo/1,https://tw
2260   https://twitter.com/dogratingrating/status/667548415174144001/photo/1,https://tw
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	rating_numerator	rating_denominator	name	doggo	floofer	pupper \
19	13	10	Canela	None	None	None
32	12	10	None	None	None	None
36	13	10	Lilly	None	None	None
68	14	10	Emmy	None	None	None
73	13	10	Shadow	None	None	None
74	11	10	Terrance	None	None	None
78	14	10	None	None	None	pupper
91	12	10	Coco	None	None	None
95	14	10	Walter	None	None	None
97	12	10	Sierra	None	None	pupper
101	14	10	None	None	None	None

109	12	10	Dawn	None	None	None
118	12	10	quite	None	None	None
124	12	10	Cooper	None	None	None
130	13	10	None	None	None	None
132	13	10	Jamesy	None	None	pupper
137	12	10	None	None	None	pupper
146	13	10	Quinn	None	None	None
155	13	10	None	None	None	None
159	13	10	Lorenzo	None	None	None
160	13	10	None	None	None	None
165	10	10	None	None	None	None
171	12	10	Winston	None	None	None
180	13	10	None	None	None	None
182	13	10	Luna	None	None	None
185	14	10	None	None	None	None
194	12	10	George	None	None	None
195	14	10	None	None	None	None
204	13	10	None	None	None	None
211	13	10	Astrid	doggo	None	None
...	..	..	...	...	...	...
784	9	11	None	None	None	None
794	11	10	Fizz	None	None	None
800	10	10	Gromit	None	None	None
811	11	10	Frankie	None	None	None
815	12	10	None	None	None	pupper
818	13	10	None	doggo	None	None
822	12	10	just	doggo	None	pupper
826	13	10	None	None	None	None
829	10	10	None	None	None	pupper
833	12	10	Nollie	None	None	None
841	10	10	None	None	None	None
847	12	10	Colby	None	None	None
860	8	10	Eve	None	None	pupper
868	10	10	None	None	None	None
872	13	10	None	None	None	None
885	11	10	None	None	None	None
890	10	10	None	None	None	None
895	11	10	None	None	None	None
908	11	10	Chompsky	None	None	None
911	11	10	None	None	None	pupper
926	11	10	Rubio	None	None	None
937	12	10	Carly	None	None	None
943	11	10	None	None	None	None
949	13	10	None	None	None	None
1012	13	10	None	None	None	pupper
1023	10	10	Shaggy	None	None	None
1043	10	10	None	None	None	None
1242	12	10	None	None	None	None

2259	12	10	None	None	None	None
2260	5	10	None	None	None	None

	puppo
19	None
32	None
36	None
68	None
73	None
74	None
78	None
91	None
95	None
97	None
101	None
109	None
118	None
124	None
130	None
132	None
137	None
146	None
155	None
159	None
160	None
165	None
171	None
180	None
182	None
185	None
194	None
195	None
204	None
211	None
...	...
784	None
794	None
800	None
811	None
815	None
818	None
822	None
826	None
829	None
833	None
841	None
847	None
860	None

```
868    None
872    None
885    None
890    None
895    None
908    None
911    None
926    None
937    None
943    None
949    None
1012   None
1023   None
1043   None
1242   None
2259   None
2260   None

[181 rows x 17 columns]
```

In [304]: image_predictions

Out[304]:   tweet_id \
         0   666020888022790149
         1   666029285002620928
         2   666033412701032449
         3   666044226329800704
         4   666049248165822465
         5   666050758794694657
         6   666051853826850816
         7   666055525042405380
         8   666057090499244032
         9   666058600524156928
         10   666063827256086533
         11   666071193221509120
         12   666073100786774016
         13   666082916733198337
         14   666094000022159362
         15   666099513787052032
         16   666102155909144576
         17   666104133288665088
         18   666268910803644416
         19   666273097616637952
         20   666287406224695296
         21   666293911632134144
         22   666337882303524864
         23   666345417576210432
         24   666353288456101888

```
25      666362758909284353
26      666373753744588802
27      666396247373291520
28      664407126856765440
29      666411507551481857
...                    ...
2045    886366144734445568
2046    886680336477933568
2047    886736880519319552
2048    886983233522544640
2049    887101392804085760
2050    887343217045368832
2051    887473957103951883
2052    887517139158093824
2053    887705289381826560
2054    888078434458587136
2055    888202515573088257
2056    888554962724278272
2057    888804989199671297
2058    888917238123831296
2059    889278841981685760
2060    889531135344209921
2061    889638837579907072
2062    889665388333682689
2063    889880896479866881
2064    890006608113172480
2065    890240255349198849
2066    890609185150312448
2067    890729181411237888
2068    890971913173991426
2069    891087950875897856
2070    891327558926688256
2071    891689557279858688
2072    891815181378084864
2073    892177421306343426
2074    892420643555336193


0       https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg
1       https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
2       https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
3       https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
4       https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
5       https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
6       https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
7       https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
8       https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg
9       https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
```

```
10      https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
11      https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg
12      https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
13      https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
14      https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
15      https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg
16      https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg
17      https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg
18      https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg
19      https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg
20      https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
21      https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg
22      https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg
23      https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
24      https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg
25      https://pbs.twimg.com/media/CT9lXGsUcAAyUFt.jpg
26      https://pbs.twimg.com/media/CT9vZEYWUAAlZO5.jpg
27      https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
28      https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
29      https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
...                                                   ...
2045    https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg
2046    https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg
2047    https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg
2048    https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg
2049    https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
2050    https://pbs.twimg.com/ext_tw_video_thumb/887343120832229379/pu/img/6HSuFrW1lzI_9
2051    https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
2052    https://pbs.twimg.com/ext_tw_video_thumb/887517108413886465/pu/img/WanJKwssZj4VJ
2053    https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg
2054    https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg
2055    https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
2056    https://pbs.twimg.com/media/DFTH_O-UQAACu2O.jpg
2057    https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
2058    https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg
2059    https://pbs.twimg.com/ext_tw_video_thumb/889278779352338437/pu/img/VlbFB3v8H8Vwz
2060    https://pbs.twimg.com/media/DFg_2PVWOAEHN3p.jpg
2061    https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg
2062    https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
2063    https://pbs.twimg.com/media/DFl99B1WsAITKsg.jpg
2064    https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
2065    https://pbs.twimg.com/media/DFrEyVuWOAAO3t9.jpg
2066    https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
2067    https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
2068    https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
2069    https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
2070    https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
2071    https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
```

```
2072   https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
2073   https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2074   https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg
```

	img_num	p1	p1_conf	p1_dog \
0	1	Welsh_springer_spaniel	0.465074	True
1	1	redbone	0.506826	True
2	1	German_shepherd	0.596461	True
3	1	Rhodesian_ridgeback	0.408143	True
4	1	miniature_pinscher	0.560311	True
5	1	Bernese_mountain_dog	0.651137	True
6	1	box_turtle	0.933012	False
7	1	chow	0.692517	True
8	1	shopping_cart	0.962465	False
9	1	miniature_poodle	0.201493	True
10	1	golden_retriever	0.775930	True
11	1	Gordon_setter	0.503672	True
12	1	Walker_hound	0.260857	True
13	1	pug	0.489814	True
14	1	bloodhound	0.195217	True
15	1	Lhasa	0.582330	True
16	1	English_setter	0.298617	True
17	1	hen	0.965932	False
18	1	desktop_computer	0.086502	False
19	1	Italian_greyhound	0.176053	True
20	1	Maltese_dog	0.857531	True
21	1	three-toed_sloth	0.914671	False
22	1	ox	0.416669	False
23	1	golden_retriever	0.858744	True
24	1	malamute	0.336874	True
25	1	guinea_pig	0.996496	False
26	1	soft-coated_wheaten_terrier	0.326467	True
27	1	Chihuahua	0.978108	True
28	1	black-and-tan_coonhound	0.529139	True
29	1	coho	0.404640	False
...	..	...	...	...
2045	1	French_bulldog	0.999201	True
2046	1	convertible	0.738995	False
2047	1	kuvasz	0.309706	True
2048	2	Chihuahua	0.793469	True
2049	1	Samoyed	0.733942	True
2050	1	Mexican_hairless	0.330741	True
2051	2	Pembroke	0.809197	True
2052	1	limousine	0.130432	False
2053	1	basset	0.821664	True
2054	1	French_bulldog	0.995026	True
2055	2	Pembroke	0.809197	True
2056	3	Siberian_husky	0.700377	True

```
2057  1         golden_retriever              0.469760  True
2058  1         golden_retriever              0.714719  True
2059  1         whippet                       0.626152  True
2060  1         golden_retriever              0.953442  True
2061  1         French_bulldog                0.991650  True
2062  1         Pembroke                      0.966327  True
2063  1         French_bulldog                0.377417  True
2064  1         Samoyed                       0.957979  True
2065  1         Pembroke                      0.511319  True
2066  1         Irish_terrier                 0.487574  True
2067  2         Pomeranian                    0.566142  True
2068  1         Appenzeller                   0.341703  True
2069  1         Chesapeake_Bay_retriever      0.425595  True
2070  2         basset                        0.555712  True
2071  1         paper_towel                   0.170278  False
2072  1         Chihuahua                     0.716012  True
2073  1         Chihuahua                     0.323581  True
2074  1         orange                        0.097049  False
```

```
                            p2        p2_conf  p2_dog                          p3  \
0     collie                         0.156665  True    Shetland_sheepdog
1     miniature_pinscher             0.074192  True    Rhodesian_ridgeback
2     malinois                       0.138584  True    bloodhound
3     redbone                        0.360687  True    miniature_pinscher
4     Rottweiler                     0.243682  True    Doberman
5     English_springer               0.263788  True    Greater_Swiss_Mountain_dog
6     mud_turtle                     0.045885  False   terrapin
7     Tibetan_mastiff                0.058279  True    fur_coat
8     shopping_basket                0.014594  False   golden_retriever
9     komondor                       0.192305  True    soft-coated_wheaten_terrier
10    Tibetan_mastiff                0.093718  True    Labrador_retriever
11    Yorkshire_terrier              0.174201  True    Pekinese
12    English_foxhound               0.175382  True    Ibizan_hound
13    bull_mastiff                   0.404722  True    French_bulldog
14    German_shepherd                0.078260  True    malinois
15    Shih-Tzu                       0.166192  True    Dandie_Dinmont
16    Newfoundland                   0.149842  True    borzoi
17    cock                           0.033919  False   partridge
18    desk                           0.085547  False   bookcase
19    toy_terrier                    0.111884  True    basenji
20    toy_poodle                     0.063064  True    miniature_poodle
21    otter                          0.015250  False   great_grey_owl
22    Newfoundland                   0.278407  True    groenendael
23    Chesapeake_Bay_retriever       0.054787  True    Labrador_retriever
24    Siberian_husky                 0.147655  True    Eskimo_dog
25    skunk                          0.002402  False   hamster
26    Afghan_hound                   0.259551  True    briard
27    toy_terrier                    0.009397  True    papillon
```

```
28    bloodhound                  0.244220  True   flat-coated_retriever
29    barracouta                  0.271485  False  gar
...          ...                        ...    ...    ...
2045  Chihuahua                   0.000361  True   Boston_bull
2046  sports_car                  0.139952  False  car_wheel
2047  Great_Pyrenees              0.186136  True   Dandie_Dinmont
2048  toy_terrier                 0.143528  True   can_opener
2049  Eskimo_dog                  0.035029  True   Staffordshire_bullterrier
2050  sea_lion                    0.275645  False  Weimaraner
2051  Rhodesian_ridgeback         0.054950  True   beagle
2052  tow_truck                   0.029175  False  shopping_cart
2053  redbone                     0.087582  True   Weimaraner
2054  pug                         0.000932  True   bull_mastiff
2055  Rhodesian_ridgeback         0.054950  True   beagle
2056  Eskimo_dog                  0.166511  True   malamute
2057  Labrador_retriever          0.184172  True   English_setter
2058  Tibetan_mastiff             0.120184  True   Labrador_retriever
2059  borzoi                      0.194742  True   Saluki
2060  Labrador_retriever          0.013834  True   redbone
2061  boxer                       0.002129  True   Staffordshire_bullterrier
2062  Cardigan                    0.027356  True   basenji
2063  Labrador_retriever          0.151317  True   muzzle
2064  Pomeranian                  0.013884  True   chow
2065  Cardigan                    0.451038  True   Chihuahua
2066  Irish_setter                0.193054  True   Chesapeake_Bay_retriever
2067  Eskimo_dog                  0.178406  True   Pembroke
2068  Border_collie               0.199287  True   ice_lolly
2069  Irish_terrier               0.116317  True   Indian_elephant
2070  English_springer            0.225770  True   German_short-haired_pointer
2071  Labrador_retriever          0.168086  True   spatula
2072  malamute                    0.078253  True   kelpie
2073  Pekinese                    0.090647  True   papillon
2074  bagel                       0.085851  False  banana

      p3_conf  p3_dog
0     0.061428  True
1     0.072010  True
2     0.116197  True
3     0.222752  True
4     0.154629  True
5     0.016199  True
6     0.017885  False
7     0.054449  False
8     0.007959  True
9     0.082086  True
10    0.072427  True
11    0.109454  True
12    0.097471  True
```

```
13     0.048960   True
14     0.075628   True
15     0.089688   True
16     0.133649   True
17     0.000052   False
18     0.079480   False
19     0.111152   True
20     0.025581   True
21     0.013207   False
22     0.102643   True
23     0.014241   True
24     0.093412   True
25     0.000461   False
26     0.206803   True
27     0.004577   True
28     0.173810   True
29     0.189945   False
...       ...      ...
2045   0.000076   True
2046   0.044173   False
2047   0.086346   True
2048   0.032253   False
2049   0.029705   True
2050   0.134203   True
2051   0.038915   True
2052   0.026321   False
2053   0.026236   True
2054   0.000903   True
2055   0.038915   True
2056   0.111411   True
2057   0.073482   True
2058   0.105506   True
2059   0.027351   True
2060   0.007958   True
2061   0.001498   True
2062   0.004633   True
2063   0.082981   False
2064   0.008167   True
2065   0.029248   True
2066   0.118184   True
2067   0.076507   True
2068   0.193548   False
2069   0.076902   False
2070   0.175219   True
2071   0.040836   False
2072   0.031379   True
2073   0.068957   True
2074   0.076110   False
```

```
           [2075 rows x 12 columns]

In [305]: image_predictions.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2075 entries, 0 to 2074
Data columns (total 12 columns):
tweet_id    2075 non-null int64
jpg_url     2075 non-null object
img_num     2075 non-null int64
p1          2075 non-null object
p1_conf     2075 non-null float64
p1_dog      2075 non-null bool
p2          2075 non-null object
p2_conf     2075 non-null float64
p2_dog      2075 non-null bool
p3          2075 non-null object
p3_conf     2075 non-null float64
p3_dog      2075 non-null bool
dtypes: bool(3), float64(3), int64(2), object(4)
memory usage: 152.1+ KB


In [306]: tweet_info

Out[306]:                          created_at                   id               id_str  \
          0     Sun Nov 15 22:32:08 +0000 2015  666020888022790149  666020888022790149
          1     Sun Nov 15 23:05:30 +0000 2015  666029285002620928  666029285002620928
          2     Sun Nov 15 23:21:54 +0000 2015  666033412701032449  666033412701032449
          3     Mon Nov 16 00:04:52 +0000 2015  666044226329800704  666044226329800704
          4     Mon Nov 16 00:24:50 +0000 2015  666049248165822465  666049248165822465
          5     Mon Nov 16 00:30:50 +0000 2015  666050758794694657  666050758794694657
          6     Mon Nov 16 00:35:11 +0000 2015  666051853826850816  666051853826850816
          7     Mon Nov 16 00:49:46 +0000 2015  666055525042405380  666055525042405380
          8     Mon Nov 16 00:55:59 +0000 2015  666057090499244032  666057090499244032
          9     Mon Nov 16 01:01:59 +0000 2015  666058600524156928  666058600524156928
          10    Mon Nov 16 01:22:45 +0000 2015  666063827256086533  666063827256086533
          11    Mon Nov 16 01:52:02 +0000 2015  666071193221509120  666071193221509120
          12    Mon Nov 16 01:59:36 +0000 2015  666073100786774016  666073100786774016
          13    Mon Nov 16 02:38:37 +0000 2015  666082916733198337  666082916733198337
          14    Mon Nov 16 03:22:39 +0000 2015  666094000022159362  666094000022159362
          15    Mon Nov 16 03:44:34 +0000 2015  666099513787052032  666099513787052032
          16    Mon Nov 16 03:55:04 +0000 2015  666102155909144576  666102155909144576
          17    Mon Nov 16 04:02:55 +0000 2015  666104133288665088  666104133288665088
          18    Mon Nov 16 14:57:41 +0000 2015  666268910803644416  666268910803644416
          19    Mon Nov 16 15:14:19 +0000 2015  666273097616637952  666273097616637952
          20    Mon Nov 16 16:11:11 +0000 2015  666287406224695296  666287406224695296
          21    Mon Nov 16 16:37:02 +0000 2015  666293911632134144  666293911632134144
```

```
22      Mon Nov 16 19:31:45 +0000 2015   666337882303524864   666337882303524864
23      Mon Nov 16 20:01:42 +0000 2015   666345417576210432   666345417576210432
24      Mon Nov 16 20:32:58 +0000 2015   666353288456101888   666353288456101888
25      Mon Nov 16 21:10:36 +0000 2015   666362758909284353   666362758909284353
26      Mon Nov 16 21:54:18 +0000 2015   666373753744588802   666373753744588802
27      Mon Nov 16 23:23:41 +0000 2015   666396247373291520   666396247373291520
28      Tue Nov 17 00:06:54 +0000 2015   666407126856765440   666407126856765440
29      Tue Nov 17 00:24:19 +0000 2015   666411507551481857   666411507551481857
...                        ...                    ...                       ...
2301    Sat Jul 15 16:51:35 +0000 2017   886267009285017600   886267009285017600
2302    Sat Jul 15 23:25:31 +0000 2017   886366144734445568   886366144734445568
2303    Sun Jul 16 20:14:00 +0000 2017   886680336477933568   886680336477933568
2304    Sun Jul 16 23:58:41 +0000 2017   886736880519319552   886736880519319552
2305    Mon Jul 17 16:17:36 +0000 2017   886983233522544640   886983233522544640
2306    Tue Jul 18 00:07:08 +0000 2017   887101392804085760   887101392804085760
2307    Tue Jul 18 16:08:03 +0000 2017   887343217045368832   887343217045368832
2308    Wed Jul 19 00:47:34 +0000 2017   887473957103951883   887473957103951883
2309    Wed Jul 19 03:39:09 +0000 2017   887517139158093824   887517139158093824
2310    Wed Jul 19 16:06:48 +0000 2017   887705289381826560   887705289381826560
2311    Thu Jul 20 16:49:33 +0000 2017   888078434458587136   888078434458587136
2312    Sat Jul 22 00:23:06 +0000 2017   888554962724278272   888554962724278272
2313    Sat Jul 22 16:56:37 +0000 2017   888804989199671297   888804989199671297
2314    Sun Jul 23 00:22:39 +0000 2017   888917238123831296   888917238123831296
2315    Mon Jul 24 00:19:32 +0000 2017   889278841981685760   889278841981685760
2316    Mon Jul 24 17:02:04 +0000 2017   889531135344209921   889531135344209921
2317    Tue Jul 25 00:10:02 +0000 2017   889638837579907072   889638837579907072
2318    Tue Jul 25 01:55:32 +0000 2017   889665388333682689   889665388333682689
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0       Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxi
1       This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs he
2       Here is a very happy pup. Big fan of well-maintained decks. Just look at that to
3       This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like h
4       Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
5       This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Priv
6       This is an odd dog. Hard on the outside but loving on the inside. Petting still
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7	Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would d
8	My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather do
9	Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drin
10	This is the happiest dog you will ever see. Very committed owner. Nice couch. 10
11	Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good to
12	Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camo
13	Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1
14	This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confirm
15	Can stand on stump for what seems like a while. Built that birdhouse? Impressive
16	Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world is
17	Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpri
18	Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIik
19	Can take selfies 11/10 https://t.co/ws2AMaNwPW
20	This is an Albanian 3 1/2 legged Episcopalian. Loves well-polished hardwood flo
21	This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat h
22	This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ver
23	Look at this jokester thinking seat belt laws don't apply to him. Great tongue t
24	Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Bi
25	Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short leg
26	Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEy
27	Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (
28	This is a southern Vesuvius bumblegruff. Can drive a truck (wow). Made friends w
29	This is quite the dog. Gets really excited when not in water. Not very soft tho.
...	
2301	@NonWhiteHat @MayhewMayhem omg hello tanner you are a scary good boy 12/10 would
2302	This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Ge
2303	This is Derek. He's late for a dog meeting. 13/10 pet...al to the metal https://
2304	This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but he
2305	This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an env
2306	This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
2307	You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
2308	This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/
2309	I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-ins
2310	This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boo
2311	This is Gerald. He was just told he didn't get the job he interviewed for. A h*c
2312	This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirati
2313	This is Zeke. He has a new stick. Very proud of it. Would like you to throw it f
2314	This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 fo
2315	This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pl
2316	This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bone
2317	This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 w
2318	Here's a puppo that seems to be on the fence about something haha no but serious
2319	This is Bruno. He is a service shark. Only gets out of the water to assist you.
2320	This is Koda. He is a South Australian deckshark. Deceptively deadly. Frightenin
2321	This is Cassie. She is a college pup. Studying international doggo communication
2322	This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be a
2323	When you watch your owner call another dog a good boy but then they turn back to
2324	Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax

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2325  Here we have a majestic great white breaching off South Africa's coast. Absolute
2326  This is Franklin. He would like you to stop calling him "cute." He is a very fie
2327  This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us
2328  This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass.
2329  This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, sh
2330  This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut.

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2310   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2311   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2312   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
```

```
2313  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2314  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2315  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2316  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2317  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2318  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2319  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2320  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2321  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2322  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2323  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2324  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2325  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2326  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2327  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2328  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2329  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
2330  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</

      in_reply_to_status_id      ...      favorited  retweeted  \
0     NaN                        ...      False      False
1     NaN                        ...      False      False
2     NaN                        ...      False      False
3     NaN                        ...      False      False
4     NaN                        ...      False      False
5     NaN                        ...      False      False
6     NaN                        ...      False      False
7     NaN                        ...      False      False
8     NaN                        ...      False      False
9     NaN                        ...      False      False
10    NaN                        ...      False      False
11    NaN                        ...      False      False
12    NaN                        ...      False      False
13    NaN                        ...      False      False
14    NaN                        ...      False      False
15    NaN                        ...      False      False
16    NaN                        ...      False      False
17    NaN                        ...      False      False
18    NaN                        ...      False      False
19    NaN                        ...      False      False
20    NaN                        ...      False      False
21    NaN                        ...      False      False
22    NaN                        ...      False      False
23    NaN                        ...      False      False
24    NaN                        ...      False      False
25    NaN                        ...      False      False
26    NaN                        ...      False      False
27    NaN                        ...      False      False
```

```
28   NaN                           ...        False    False
29   NaN                           ...        False    False

...    ..                          ...         ...      ...
2301  8.862664e+17                 ...        False    False
2302 NaN                           ...        False    False
2303 NaN                           ...        False    False
2304 NaN                           ...        False    False
2305 NaN                           ...        False    False
2306 NaN                           ...        False    False
2307 NaN                           ...        False    False
2308 NaN                           ...        False    False
2309 NaN                           ...        False    False
2310 NaN                           ...        False    False
2311 NaN                           ...        False    False
2312 NaN                           ...        False    False
2313 NaN                           ...        False    False
2314 NaN                           ...        False    False
2315 NaN                           ...        False    False
2316 NaN                           ...        False    False
2317 NaN                           ...        False    False
2318 NaN                           ...        False    False
2319 NaN                           ...        False    False
2320 NaN                           ...        False    False
2321 NaN                           ...        False    False
2322 NaN                           ...        False    False
2323 NaN                           ...        False    False
2324 NaN                           ...        False    False
2325 NaN                           ...        False    False
2326 NaN                           ...        False    False
2327 NaN                           ...        False    False
2328 NaN                           ...        False    False
2329 NaN                           ...        False    False
2330 NaN                           ...        False    False


     possibly_sensitive possibly_sensitive_appealable lang  retweeted_status  \
0    False               False                          en   NaN
1    False               False                          en   NaN
2    False               False                          en   NaN
3    False               False                          en   NaN
4    False               False                          en   NaN
5    False               False                          en   NaN
6    False               False                          en   NaN
7    False               False                          en   NaN
8    False               False                          en   NaN
9    False               False                          en   NaN
10   False               False                          en   NaN
11   False               False                          en   NaN
12   False               False                          en   NaN
```

13	False	False	en	NaN
14	False	False	en	NaN
15	False	False	en	NaN
16	False	False	en	NaN
17	False	False	en	NaN
18	False	False	en	NaN
19	False	False	en	NaN
20	False	False	en	NaN
21	False	False	en	NaN
22	False	False	en	NaN
23	False	False	en	NaN
24	False	False	en	NaN
25	False	False	en	NaN
26	False	False	en	NaN
27	False	False	en	NaN
28	False	False	en	NaN
29	False	False	en	NaN
...	...	...	..	...
2301	NaN	NaN	en	NaN
2302	False	False	en	NaN
2303	False	False	en	NaN
2304	False	False	en	NaN
2305	False	False	en	NaN
2306	False	False	en	NaN
2307	False	False	en	NaN
2308	False	False	en	NaN
2309	False	False	en	NaN
2310	False	False	en	NaN
2311	False	False	en	NaN
2312	False	False	en	NaN
2313	False	False	en	NaN
2314	False	False	en	NaN
2315	False	False	en	NaN
2316	False	False	en	NaN
2317	False	False	en	NaN
2318	False	False	en	NaN
2319	False	False	en	NaN
2320	False	False	en	NaN
2321	False	False	en	NaN
2322	False	False	en	NaN
2323	False	False	en	NaN
2324	False	False	en	NaN
2325	False	False	en	NaN
2326	False	False	en	NaN
2327	False	False	en	NaN
2328	False	False	en	NaN
2329	False	False	en	NaN
2330	False	False	en	NaN

```
      quoted_status_id quoted_status_id_str  quoted_status_permalink  \
0     NaN                NaN                   NaN
1     NaN                NaN                   NaN
2     NaN                NaN                   NaN
3     NaN                NaN                   NaN
4     NaN                NaN                   NaN
5     NaN                NaN                   NaN
6     NaN                NaN                   NaN
7     NaN                NaN                   NaN
8     NaN                NaN                   NaN
9     NaN                NaN                   NaN
10    NaN                NaN                   NaN
11    NaN                NaN                   NaN
12    NaN                NaN                   NaN
13    NaN                NaN                   NaN
14    NaN                NaN                   NaN
15    NaN                NaN                   NaN
16    NaN                NaN                   NaN
17    NaN                NaN                   NaN
18    NaN                NaN                   NaN
19    NaN                NaN                   NaN
20    NaN                NaN                   NaN
21    NaN                NaN                   NaN
22    NaN                NaN                   NaN
23    NaN                NaN                   NaN
24    NaN                NaN                   NaN
25    NaN                NaN                   NaN
26    NaN                NaN                   NaN
27    NaN                NaN                   NaN
28    NaN                NaN                   NaN
29    NaN                NaN                   NaN
...   ..                 ..                    ...
2301  NaN                NaN                   NaN
2302  NaN                NaN                   NaN
2303  NaN                NaN                   NaN
2304  NaN                NaN                   NaN
2305  NaN                NaN                   NaN
2306  NaN                NaN                   NaN
2307  NaN                NaN                   NaN
2308  NaN                NaN                   NaN
2309  NaN                NaN                   NaN
2310  NaN                NaN                   NaN
2311  NaN                NaN                   NaN
2312  NaN                NaN                   NaN
2313  NaN                NaN                   NaN
2314  NaN                NaN                   NaN
2315  NaN                NaN                   NaN
```

```
2316 NaN                  NaN                    NaN
2317 NaN                  NaN                    NaN
2318 NaN                  NaN                    NaN
2319 NaN                  NaN                    NaN
2320 NaN                  NaN                    NaN
2321 NaN                  NaN                    NaN
2322 NaN                  NaN                    NaN
2323 NaN                  NaN                    NaN
2324 NaN                  NaN                    NaN
2325 NaN                  NaN                    NaN
2326 NaN                  NaN                    NaN
2327 NaN                  NaN                    NaN
2328 NaN                  NaN                    NaN
2329 NaN                  NaN                    NaN
2330 NaN                  NaN                    NaN

     quoted_status
0      NaN
1      NaN
2      NaN
3      NaN
4      NaN
5      NaN
6      NaN
7      NaN
8      NaN
9      NaN
10     NaN
11     NaN
12     NaN
13     NaN
14     NaN
15     NaN
16     NaN
17     NaN
18     NaN
19     NaN
20     NaN
21     NaN
22     NaN
23     NaN
24     NaN
25     NaN
26     NaN
27     NaN
28     NaN
29     NaN
...    ...
```

```
            2301  NaN
            2302  NaN
            2303  NaN
            2304  NaN
            2305  NaN
            2306  NaN
            2307  NaN
            2308  NaN
            2309  NaN
            2310  NaN
            2311  NaN
            2312  NaN
            2313  NaN
            2314  NaN
            2315  NaN
            2316  NaN
            2317  NaN
            2318  NaN
            2319  NaN
            2320  NaN
            2321  NaN
            2322  NaN
            2323  NaN
            2324  NaN
            2325  NaN
            2326  NaN
            2327  NaN
            2328  NaN
            2329  NaN
            2330  NaN

            [2331 rows x 32 columns]

In [307]: tweet_info.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2331 entries, 0 to 2330
Data columns (total 32 columns):
created_at                  2331 non-null object
id                          2331 non-null int64
id_str                      2331 non-null int64
full_text                   2331 non-null object
truncated                   2331 non-null bool
display_text_range          2331 non-null object
entities                    2331 non-null object
extended_entities           2059 non-null object
source                      2331 non-null object
in_reply_to_status_id       77 non-null float64
```

```
in_reply_to_status_id_str      77 non-null float64
in_reply_to_user_id            77 non-null float64
in_reply_to_user_id_str        77 non-null float64
in_reply_to_screen_name        77 non-null object
user                           2331 non-null object
geo                            0 non-null float64
coordinates                    0 non-null float64
place                          1 non-null object
contributors                   0 non-null float64
is_quote_status                2331 non-null bool
retweet_count                  2331 non-null int64
favorite_count                 2331 non-null int64
favorited                      2331 non-null bool
retweeted                      2331 non-null bool
possibly_sensitive             2196 non-null object
possibly_sensitive_appealable  2196 non-null object
lang                           2331 non-null object
retweeted_status               163 non-null object
quoted_status_id               26 non-null float64
quoted_status_id_str           26 non-null float64
quoted_status_permalink        26 non-null object
quoted_status                  24 non-null object
dtypes: bool(4), float64(9), int64(4), object(15)
memory usage: 519.1+ KB
```

1.1.3   Clean

First of al: make a copy of all dataframes

```
In [308]: twitter_archive_copy = twitter_archive.copy()
          image_predictions_copy = image_predictions.copy()
          tweet_info_copy = tweet_info.copy()
```

Issue 1 - 3 : Define

- merge three dataframes to one dataframe with the following columns: tweet_id, timestamp, text, namerating_numenator, rating_denominator, name, retweet_count, favourite_count, picture url and the image_predictions table except for the columns img_num
- first extract the necessary columns by using iloc or drop function
- rename the column 'id' to 'tweet_id' to enable merger
- use merge function with inner join to merge on tweet_ids that are in all dataframes and drop ids that are not existent in all dataframes

Issue 1 - 3 : Code

```
In [309]: #choose the columns outlined above for the merger
          df_clean = twitter_archive.iloc[:,[0,3,5,10,11,12]]
```

```
          to_merge1 = tweet_info.iloc[:,[1,20,21]]
          to_merge2 = image_predictions.drop(columns='img_num')

In [310]: #rename the id column to tweet_id
          to_merge1 = to_merge1.rename(columns={'id':'tweet_id'})

In [311]: #merge
          df_clean2 = pd.merge(df_clean, to_merge1, how='inner', on='tweet_id')
          df_clean3 = pd.merge(df_clean2, to_merge2, how='inner', on='tweet_id')
```

Issue 1 - 3 : Test

```
In [312]: df_clean3.head()

Out[312]:              tweet_id                    timestamp  \
          0  892420643555336193  2017-08-01 16:23:56 +0000
          1  892177421306343426  2017-08-01 00:17:27 +0000
          2  891815181378084864  2017-07-31 00:18:03 +0000
          3  891689557279858688  2017-07-30 15:58:51 +0000
          4  891327558926688256  2017-07-29 16:00:24 +0000


          0  This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut. 13/
          1  This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, she's
          2  This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass. You
          3  This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us htt
          4  This is Franklin. He would like you to stop calling him "cute." He is a very fierce

             rating_numerator  rating_denominator       name  retweet_count  \
          0  13                10                    Phineas   7723
          1  13                10                    Tilly     5712
          2  12                10                    Archie    3786
          3  13                10                    Darla     7878
          4  12                10                    Franklin  8498

             favorite_count                                          jpg_url  \
          0  36278           https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg
          1  31282           https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
          2  23552           https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
          3  39566           https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
          4  37793           https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg

                     p1   p1_conf  p1_dog                 p2   p2_conf  p2_dog  \
          0  orange      0.097049  False  bagel               0.085851  False
          1  Chihuahua   0.323581  True   Pekinese            0.090647  True
          2  Chihuahua   0.716012  True   malamute            0.078253  True
          3  paper_towel 0.170278  False  Labrador_retriever  0.168086  True
          4  basset      0.555712  True   English_springer    0.225770  True
```

```
                                    p3    p3_conf  p3_dog
              0  banana                    0.076110  False
              1  papillon                  0.068957  True
              2  kelpie                    0.031379  True
              3  spatula                   0.040836  False
              4  German_short-haired_pointer  0.175219  True
```

```
In [313]: df_clean = df_clean3.copy()
```

```
In [314]: df_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2059 entries, 0 to 2058
Data columns (total 18 columns):
tweet_id             2059 non-null int64
timestamp            2059 non-null object
text                 2059 non-null object
rating_numerator     2059 non-null int64
rating_denominator   2059 non-null int64
name                 2059 non-null object
retweet_count        2059 non-null int64
favorite_count       2059 non-null int64
jpg_url              2059 non-null object
p1                   2059 non-null object
p1_conf              2059 non-null float64
p1_dog               2059 non-null bool
p2                   2059 non-null object
p2_conf              2059 non-null float64
p2_dog               2059 non-null bool
p3                   2059 non-null object
p3_conf              2059 non-null float64
p3_dog               2059 non-null bool
dtypes: bool(3), float64(3), int64(5), object(7)
memory usage: 263.4+ KB
```

Issue 4 : Define

- remore retweets from cleaned master dataframe by dropping of tweets that have an retweet id

Issue 4 : Code

```
In [315]: df_clean4 = df_clean[~df_clean.tweet_id.isin(retweet_ids.tweet_id)]
          df_clean4
```

```
Out[315]:              tweet_id                    timestamp  \
          0      892420643555336193  2017-08-01 16:23:56 +0000
```

```
1       892177421306343426   2017-08-01 00:17:27 +0000
2       891815181378084864   2017-07-31 00:18:03 +0000
3       891689557279858688   2017-07-30 15:58:51 +0000
4       891327558926688256   2017-07-29 16:00:24 +0000
5       891087950875897856   2017-07-29 00:08:17 +0000
6       890971913173991426   2017-07-28 16:27:12 +0000
7       890729181411237888   2017-07-28 00:22:40 +0000
8       890609185150312448   2017-07-27 16:25:51 +0000
9       890240255349198849   2017-07-26 15:59:51 +0000
10      890006608113172480   2017-07-26 00:31:25 +0000
11      889880896479866881   2017-07-25 16:11:53 +0000
12      889665388333682689   2017-07-25 01:55:32 +0000
13      889638837579907072   2017-07-25 00:10:02 +0000
14      889531135344209921   2017-07-24 17:02:04 +0000
15      889278841981685760   2017-07-24 00:19:32 +0000
16      888917238123831296   2017-07-23 00:22:39 +0000
17      888804989199671297   2017-07-22 16:56:37 +0000
18      888554962724278272   2017-07-22 00:23:06 +0000
19      888078434458587136   2017-07-20 16:49:33 +0000
20      887705289381826560   2017-07-19 16:06:48 +0000
21      887517139158093824   2017-07-19 03:39:09 +0000
22      887473957103951883   2017-07-19 00:47:34 +0000
23      887343217045368832   2017-07-18 16:08:03 +0000
24      887101392804085760   2017-07-18 00:07:08 +0000
25      886983233522544640   2017-07-17 16:17:36 +0000
26      886736880519319552   2017-07-16 23:58:41 +0000
27      886680336477933568   2017-07-16 20:14:00 +0000
28      886366144734445568   2017-07-15 23:25:31 +0000
29      886258384151887873   2017-07-15 16:17:19 +0000
...              ...                        ...
2029    666411507551481857   2015-11-17 00:24:19 +0000
2030    666407126856765440   2015-11-17 00:06:54 +0000
2031    666396247373291520   2015-11-16 23:23:41 +0000
2032    666373753744588802   2015-11-16 21:54:18 +0000
2033    666362758909284353   2015-11-16 21:10:36 +0000
2034    666353288456101888   2015-11-16 20:32:58 +0000
2035    666345417576210432   2015-11-16 20:01:42 +0000
2036    666337882303524864   2015-11-16 19:31:45 +0000
2037    666293911632134144   2015-11-16 16:37:02 +0000
2038    666287406224695296   2015-11-16 16:11:11 +0000
2039    666273097616637952   2015-11-16 15:14:19 +0000
2040    666268910803644416   2015-11-16 14:57:41 +0000
2041    666104133288665088   2015-11-16 04:02:55 +0000
2042    666102155909144576   2015-11-16 03:55:04 +0000
2043    666099513787052032   2015-11-16 03:44:34 +0000
2044    666094000022159362   2015-11-16 03:22:39 +0000
2045    666082916733198337   2015-11-16 02:38:37 +0000
2046    666073100786774016   2015-11-16 01:59:36 +0000
```

```
2047   666071193221509120   2015-11-16 01:52:02 +0000
2048   666063827256086533   2015-11-16 01:22:45 +0000
2049   666058600524156928   2015-11-16 01:01:59 +0000
2050   666057090499244032   2015-11-16 00:55:59 +0000
2051   666055525042405380   2015-11-16 00:49:46 +0000
2052   666051853826850816   2015-11-16 00:35:11 +0000
2053   666050758794694657   2015-11-16 00:30:50 +0000
2054   666049248165822465   2015-11-16 00:24:50 +0000
2055   666044226329800704   2015-11-16 00:04:52 +0000
2056   666033412701032449   2015-11-15 23:21:54 +0000
2057   666029285002620928   2015-11-15 23:05:30 +0000
2058   666020888022790149   2015-11-15 22:32:08 +0000


0      This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut.
1      This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, sh
2      This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass.
3      This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us
4      This is Franklin. He would like you to stop calling him "cute." He is a very fie
5      Here we have a majestic great white breaching off South Africa's coast. Absolute
6      Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax
7      When you watch your owner call another dog a good boy but then they turn back to
8      This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be a
9      This is Cassie. She is a college pup. Studying international doggo communication
10     This is Koda. He is a South Australian deckshark. Deceptively deadly. Frightenin
11     This is Bruno. He is a service shark. Only gets out of the water to assist you.
12     Here's a puppo that seems to be on the fence about something haha no but serious
13     This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 w
14     This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bone
15     This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pl
16     This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 fo
17     This is Zeke. He has a new stick. Very proud of it. Would like you to throw it f
18     This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirati
19     This is Gerald. He was just told he didn't get the job he interviewed for. A h*c
20     This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boo
21     I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-ins
22     This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/
23     You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
24     This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
25     This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an env
26     This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but he
27     This is Derek. He's late for a dog meeting. 13/10 pet...al to the metal https://
28     This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Ge
29     This is Waffles. His doggles are pupside down. Unsure how to fix. 13/10 someone
...
2029   This is quite the dog. Gets really excited when not in water. Not very soft tho.
2030   This is a southern Vesuvius bumblegruff. Can drive a truck (wow). Made friends w
2031   Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (
```

```
2032   Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEy
2033   Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short leg
2034   Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Bi
2035   Look at this jokester thinking seat belt laws don't apply to him. Great tongue t
2036   This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ver
2037   This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat h
2038   This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood flo
2039   Can take selfies 11/10 https://t.co/ws2AMaNwPW
2040   Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIik
2041   Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpri
2042   Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world is
2043   Can stand on stump for what seems like a while. Built that birdhouse? Impressive
2044   This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confirm
2045   Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1
2046   Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camo
2047   Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good to
2048   This is the happiest dog you will ever see. Very committed owner. Nice couch. 10
2049   Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drin
2050   My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather do
2051   Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would d
2052   This is an odd dog. Hard on the outside but loving on the inside. Petting still
2053   This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Priv
2054   Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
2055   This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like h
2056   Here is a very happy pup. Big fan of well-maintained decks. Just look at that to
2057   This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs he
2058   Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxi

       rating_numerator  rating_denominator       name  retweet_count  \
0      13                10                  Phineas    7723
1      13                10                  Tilly     5712
2      12                10                  Archie    3786
3      13                10                  Darla     7878
4      12                10                  Franklin  8498
5      13                10                  None      2847
6      13                10                  Jax       1854
7      13                10                  None      17233
8      13                10                  Zoey      3921
9      14                10                  Cassie    6710
10     13                10                  Koda      6699
11     13                10                  Bruno     4559
12     13                10                  None      9150
13     12                10                  Ted       4101
14     13                10                  Stuart    2061
15     13                10                  Oliver    4870
16     12                10                  Jim       4113
17     13                10                  Zeke      3877
18     13                10                  Ralphus   3183
```

19	12	10	Gerald	3164
20	13	10	Jeffrey	4916
21	14	10	such	10761
22	13	10	Canela	16448
23	13	10	None	9563
24	12	10	None	5449
25	13	10	Maya	7014
26	13	10	Mingus	2937
27	13	10	Derek	4085
28	12	10	Roscoe	2895
29	13	10	Waffles	5768
...	..	..	...	...
2029	2	10	quite	301
2030	7	10	a	32
2031	9	10	None	76
2032	11	10	None	84
2033	6	10	None	520
2034	8	10	None	66
2035	10	10	None	128
2036	9	10	an	84
2037	3	10	a	321
2038	1	2	an	62
2039	11	10	None	73
2040	10	10	None	32
2041	1	10	None	6001
2042	11	10	None	11
2043	8	10	None	60
2044	9	10	None	67
2045	6	10	None	41
2046	10	10	None	147
2047	9	10	None	53
2048	10	10	the	198
2049	8	10	the	54
2050	9	10	a	127
2051	10	10	a	221
2052	2	10	an	778
2053	10	10	a	51
2054	5	10	None	39
2055	6	10	a	132
2056	9	10	a	41
2057	7	10	a	42
2058	8	10	None	462

```
      favorite_count  \
0         36278
1         31282
2         23552
3         39566
```

4	37793
5	19040
6	11083
7	61132
8	26196
9	29926
10	28811
11	26210
12	45129
13	25406
14	14209
15	23666
16	27349
17	24039
18	18557
19	20458
20	28404
21	43587
22	64604
23	31619
24	28771
25	32825
26	11260
27	21116
28	19871
29	26310
...	...
2029	413
2030	100
2031	159
2032	174
2033	727
2034	199
2035	275
2036	182
2037	468
2038	138
2039	161
2040	95
2041	13682
2042	72
2043	143
2044	154
2045	103
2046	297
2047	136
2048	447
2049	105

```
2050    270
2051    410
2052    1129
2053    125
2054    96
2055    272
2056    112
2057    121
2058    2417


0       https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg
1       https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2       https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
3       https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
4       https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
5       https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
6       https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
7       https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
8       https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
9       https://pbs.twimg.com/media/DFrEyVuW0AAO3t9.jpg
10      https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
11      https://pbs.twimg.com/media/DFl99B1WsAITKsg.jpg
12      https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
13      https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg
14      https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg
15      https://pbs.twimg.com/ext_tw_video_thumb/889278779352338437/pu/img/VlbFB3v8H8Vwz
16      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg
17      https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
18      https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg
19      https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg
20      https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg
21      https://pbs.twimg.com/ext_tw_video_thumb/887517108413886465/pu/img/WanJKwssZj4VJ
22      https://pbs.twimg.com/media/DFDw2tyUQAAFke.jpg
23      https://pbs.twimg.com/ext_tw_video_thumb/887343120832229379/pu/img/6HSuFrW1lzI_9
24      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
25      https://pbs.twimg.com/media/DE8yicJW0AAAvBJ.jpg
26      https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg
27      https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg
28      https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg
29      https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg
...                                                     ...
2029    https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
2030    https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
2031    https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
2032    https://pbs.twimg.com/media/CT9vZEYWUAAlZO5.jpg
2033    https://pbs.twimg.com/media/CT9lXGsUcAAyUFt.jpg
2034    https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg
```

```
2035    https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
2036    https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg
2037    https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg
2038    https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
2039    https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg
2040    https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg
2041    https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg
2042    https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg
2043    https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg
2044    https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
2045    https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
2046    https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
2047    https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg
2048    https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
2049    https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
2050    https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg
2051    https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
2052    https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
2053    https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
2054    https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
2055    https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
2056    https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
2057    https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
2058    https://pbs.twimg.com/media/CT4udnOWwAAOaMy.jpg
```

```
                             p1    p1_conf  p1_dog                         p2  \
0     orange                       0.097049 False   bagel
1     Chihuahua                    0.323581 True    Pekinese
2     Chihuahua                    0.716012 True    malamute
3     paper_towel                  0.170278 False   Labrador_retriever
4     basset                       0.555712 True    English_springer
5     Chesapeake_Bay_retriever     0.425595 True    Irish_terrier
6     Appenzeller                  0.341703 True    Border_collie
7     Pomeranian                   0.566142 True    Eskimo_dog
8     Irish_terrier                0.487574 True    Irish_setter
9     Pembroke                     0.511319 True    Cardigan
10    Samoyed                      0.957979 True    Pomeranian
11    French_bulldog               0.377417 True    Labrador_retriever
12    Pembroke                     0.966327 True    Cardigan
13    French_bulldog               0.991650 True    boxer
14    golden_retriever             0.953442 True    Labrador_retriever
15    whippet                      0.626152 True    borzoi
16    golden_retriever             0.714719 True    Tibetan_mastiff
17    golden_retriever             0.469760 True    Labrador_retriever
18    Siberian_husky               0.700377 True    Eskimo_dog
19    French_bulldog               0.995026 True    pug
20    basset                       0.821664 True    redbone
21    limousine                    0.130432 False   tow_truck
```

22	Pembroke	0.809197	True	Rhodesian_ridgeback
23	Mexican_hairless	0.330741	True	sea_lion
24	Samoyed	0.733942	True	Eskimo_dog
25	Chihuahua	0.793469	True	toy_terrier
26	kuvasz	0.309706	True	Great_Pyrenees
27	convertible	0.738995	False	sports_car
28	French_bulldog	0.999201	True	Chihuahua
29	pug	0.943575	True	shower_cap
...	...	...	...	...
2029	coho	0.404640	False	barracouta
2030	black-and-tan_coonhound	0.529139	True	bloodhound
2031	Chihuahua	0.978108	True	toy_terrier
2032	soft-coated_wheaten_terrier	0.326467	True	Afghan_hound
2033	guinea_pig	0.996496	False	skunk
2034	malamute	0.336874	True	Siberian_husky
2035	golden_retriever	0.858744	True	Chesapeake_Bay_retriever
2036	ox	0.416669	False	Newfoundland
2037	three-toed_sloth	0.914671	False	otter
2038	Maltese_dog	0.857531	True	toy_poodle
2039	Italian_greyhound	0.176053	True	toy_terrier
2040	desktop_computer	0.086502	False	desk
2041	hen	0.965932	False	cock
2042	English_setter	0.298617	True	Newfoundland
2043	Lhasa	0.582330	True	Shih-Tzu
2044	bloodhound	0.195217	True	German_shepherd
2045	pug	0.489814	True	bull_mastiff
2046	Walker_hound	0.260857	True	English_foxhound
2047	Gordon_setter	0.503672	True	Yorkshire_terrier
2048	golden_retriever	0.775930	True	Tibetan_mastiff
2049	miniature_poodle	0.201493	True	komondor
2050	shopping_cart	0.962465	False	shopping_basket
2051	chow	0.692517	True	Tibetan_mastiff
2052	box_turtle	0.933012	False	mud_turtle
2053	Bernese_mountain_dog	0.651137	True	English_springer
2054	miniature_pinscher	0.560311	True	Rottweiler
2055	Rhodesian_ridgeback	0.408143	True	redbone
2056	German_shepherd	0.596461	True	malinois
2057	redbone	0.506826	True	miniature_pinscher
2058	Welsh_springer_spaniel	0.465074	True	collie

	p2_conf	p2_dog		p3	p3_conf	p3_dog
0	0.085851	False	banana		0.076110	False
1	0.090647	True	papillon		0.068957	True
2	0.078253	True	kelpie		0.031379	True
3	0.168086	True	spatula		0.040836	False
4	0.225770	True	German_short-haired_pointer	0.175219	True
5	0.116317	True	Indian_elephant		0.076902	False
6	0.199287	True	ice_lolly		0.193548	False

7	0.178406	True	Pembroke	0.076507	True
8	0.193054	True	Chesapeake_Bay_retriever	0.118184	True
9	0.451038	True	Chihuahua	0.029248	True
10	0.013884	True	chow	0.008167	True
11	0.151317	True	muzzle	0.082981	False
12	0.027356	True	basenji	0.004633	True
13	0.002129	True	Staffordshire_bullterrier	0.001498	True
14	0.013834	True	redbone	0.007958	True
15	0.194742	True	Saluki	0.027351	True
16	0.120184	True	Labrador_retriever	0.105506	True
17	0.184172	True	English_setter	0.073482	True
18	0.166511	True	malamute	0.111411	True
19	0.000932	True	bull_mastiff	0.000903	True
20	0.087582	True	Weimaraner	0.026236	True
21	0.029175	False	shopping_cart	0.026321	False
22	0.054950	True	beagle	0.038915	True
23	0.275645	False	Weimaraner	0.134203	True
24	0.035029	True	Staffordshire_bullterrier	0.029705	True
25	0.143528	True	can_opener	0.032253	False
26	0.186136	True	Dandie_Dinmont	0.086346	True
27	0.139952	False	car_wheel	0.044173	False
28	0.000361	True	Boston_bull	0.000076	True
29	0.025286	False	Siamese_cat	0.002849	False
...	...	...	...	...	...
2029	0.271485	False	gar	0.189945	False
2030	0.244220	True	flat-coated_retriever	0.173810	True
2031	0.009397	True	papillon	0.004577	True
2032	0.259551	True	briard	0.206803	True
2033	0.002402	False	hamster	0.000461	False
2034	0.147655	True	Eskimo_dog	0.093412	True
2035	0.054787	True	Labrador_retriever	0.014241	True
2036	0.278407	True	groenendael	0.102643	True
2037	0.015250	False	great_grey_owl	0.013207	False
2038	0.063064	True	miniature_poodle	0.025581	True
2039	0.111884	True	basenji	0.111152	True
2040	0.085547	False	bookcase	0.079480	False
2041	0.033919	False	partridge	0.000052	False
2042	0.149842	True	borzoi	0.133649	True
2043	0.166192	True	Dandie_Dinmont	0.089688	True
2044	0.078260	True	malinois	0.075628	True
2045	0.404722	True	French_bulldog	0.048960	True
2046	0.175382	True	Ibizan_hound	0.097471	True
2047	0.174201	True	Pekinese	0.109454	True
2048	0.093718	True	Labrador_retriever	0.072427	True
2049	0.192305	True	soft-coated_wheaten_terrier	0.082086	True
2050	0.014594	False	golden_retriever	0.007959	True
2051	0.058279	True	fur_coat	0.054449	False
2052	0.045885	False	terrapin	0.017885	False

```
2053  0.263788  True    Greater_Swiss_Mountain_dog    0.016199  True
2054  0.243682  True    Doberman                      0.154629  True
2055  0.360687  True    miniature_pinscher            0.222752  True
2056  0.138584  True    bloodhound                    0.116197  True
2057  0.074192  True    Rhodesian_ridgeback           0.072010  True
2058  0.156665  True    Shetland_sheepdog             0.061428  True

[1987 rows x 18 columns]
```

Issue 4 : Test

```
In [316]: test = df_clean4[df_clean4.tweet_id.isin(retweet_ids.tweet_id)]
          test

Out[316]: Empty DataFrame
          Columns: [tweet_id, timestamp, text, rating_numerator, rating_denominator, name, retwe
          Index: []

In [317]: df_clean = df_clean4
```

Issue 5 + 6 : Define

- query the dog age columns to find out if only one dog stage is given per dog
- create a column 'dog_age'
- Set the None values to np.nan in all the 4 dog stage columns
- drop the columns where for all four stages are NA values
- use df.agg() function to melt four columns (puppo, pupper, doggo, floofer) into column 'dog_age'
- replace the NA values with " in the dog_age column by using apply() and replace()
- merge the column 'dog_age' into master dataframe with left join on the tweet_id indicator

Issue 5 + 6: Code

```
In [318]: more_than1 = twitter_archive.loc[(twitter_archive[['doggo', 'floofer', 'pupper', 'pupp
                       ).sum(axis=1) > 1]
          more_than1

Out[318]:                  tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
          191    855851453814013952 NaN                    NaN
          200    854010172552949760 NaN                    NaN
          460    817777686764523521 NaN                    NaN
          531    808106460588765185 NaN                    NaN
          565    802265048156610565  7.331095e+17           4.196984e+09
          575    801115127852503040 NaN                    NaN
          705    785639753186217984 NaN                    NaN
          733    781308096455073793 NaN                    NaN
          778    775898661951791106 NaN                    NaN
          822    770093767776997377 NaN                    NaN
          889    759793422261743616 NaN                    NaN
```

```
956   751583847268179968 NaN                      NaN
1063  741067306818797568 NaN                      NaN
1113  733109485275860992 NaN                      NaN


                     timestamp  \
191   2017-04-22 18:31:02 +0000
200   2017-04-17 16:34:26 +0000
460   2017-01-07 16:59:28 +0000
531   2016-12-12 00:29:28 +0000
565   2016-11-25 21:37:47 +0000
575   2016-11-22 17:28:25 +0000
705   2016-10-11 00:34:48 +0000
733   2016-09-29 01:42:20 +0000
778   2016-09-14 03:27:11 +0000
822   2016-08-29 03:00:36 +0000
889   2016-07-31 16:50:42 +0000
956   2016-07-09 01:08:47 +0000
1063  2016-06-10 00:39:48 +0000
1113  2016-05-19 01:38:16 +0000


                                                                          sour
191   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
200   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
460   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
531   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
565   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
575   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
705   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
733   <a href="http://vine.co" rel="nofollow">Vine - Make a Scene</a>
778   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
822   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
889   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
956   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
1063  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</
1113  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</


191   Here's a puppo participating in the #ScienceMarch. Cleverly disguising her own d
200   At first I thought this was a shy doggo, but it's actually a Rare Canadian Floof
460   This is Dido. She's playing the lead role in "Pupper Stops to Catch Snow Before
531   Here we have Burke (pupper) and Dexter (doggo). Pupper wants to be exactly like
565   Like doggo, like pupper version 2. Both 11/10 https://t.co/9IxWAXFqze
575   This is Bones. He's being haunted by another doggo of roughly the same size. 12/
705   This is Pinot. He's a sophisticated doggo. You can tell by the hat. Also pointie
733   Pupper butt 1, Doggo 0. Both 12/10 https://t.co/WQvcPEpH2u
778   RT @dog_rates: Like father (doggo), like son (pupper). Both 12/10 https://t.co/p
822   RT @dog_rates: This is just downright precious af. 12/10 for both pupper and dog
889   Meet Maggie &amp; Lila. Maggie is the doggo, Lila is the pupper. They are sister
```

```
956    Please stop sending it pictures that don't even have a doggo or pupper in them.
1063   This is just downright precious af. 12/10 for both pupper and doggo https://t.co
1113   Like father (doggo), like son (pupper). Both 12/10 https://t.co/pG2inLaOda

      retweeted_status_id  retweeted_status_user_id  \
191   NaN                  NaN
200   NaN                  NaN
460   NaN                  NaN
531   NaN                  NaN
565   NaN                  NaN
575   NaN                  NaN
705   NaN                  NaN
733   NaN                  NaN
778    7.331095e+17             4.196984e+09
822    7.410673e+17             4.196984e+09
889   NaN                  NaN
956   NaN                  NaN
1063  NaN                  NaN
1113  NaN                  NaN

     retweeted_status_timestamp  \
191    NaN
200    NaN
460    NaN
531    NaN
565    NaN
575    NaN
705    NaN
733    NaN
778    2016-05-19 01:38:16 +0000
822    2016-06-10 00:39:48 +0000
889    NaN
956    NaN
1063   NaN
1113   NaN


191    https://twitter.com/dog_rates/status/855851453814013952/photo/1
200    https://twitter.com/dog_rates/status/854010172552949760/photo/1,https://twitter.
460    https://twitter.com/dog_rates/status/817777686764523521/video/1
531    https://twitter.com/dog_rates/status/808106460588765185/photo/1
565    https://twitter.com/dog_rates/status/802265048156610565/photo/1
575    https://twitter.com/dog_rates/status/801115127852503040/photo/1,https://twitter.
705    https://twitter.com/dog_rates/status/785639753186217984/photo/1,https://twitter.
733    https://vine.co/v/5rgu2Law2ut
778    https://twitter.com/dog_rates/status/733109485275860992/photo/1,https://twitter.
822    https://twitter.com/dog_rates/status/741067306818797568/photo/1,https://twitter.
889    https://twitter.com/dog_rates/status/759793422261743616/photo/1,https://twitter.
```

```
        956   https://twitter.com/dog_rates/status/751583847268179968/photo/1
        1063  https://twitter.com/dog_rates/status/741067306818797568/photo/1
        1113  https://twitter.com/dog_rates/status/733109485275860992/photo/1

              rating_numerator  rating_denominator    name  doggo  floofer  pupper  \
        191   13                10                    None  doggo  None     None
        200   11                10                    None  doggo  floofer  None
        460   13                10                    Dido  doggo  None     pupper
        531   12                10                    None  doggo  None     pupper
        565   11                10                    None  doggo  None     pupper
        575   12                10                    Bones doggo  None     pupper
        705   10                10                    Pinot doggo  None     pupper
        733   12                10                    None  doggo  None     pupper
        778   12                10                    None  doggo  None     pupper
        822   12                10                    just  doggo  None     pupper
        889   12                10                    Maggie doggo None     pupper
        956   5                 10                    None  doggo  None     pupper
        1063  12                10                    just  doggo  None     pupper
        1113  12                10                    None  doggo  None     pupper

              puppo
        191   puppo
        200   None
        460   None
        531   None
        565   None
        575   None
        705   None
        733   None
        778   None
        822   None
        889   None
        956   None
        1063  None
        1113  None
```

In [319]: `dogs = twitter_archive[['tweet_id','puppo','pupper','floofer','doggo']].copy()`

In [320]: `#replace the values by nans for the next step of joining`
`dogs['puppo'] = dogs['puppo'].apply(lambda x: np.nan if x == "None" else x)`
`dogs['pupper'] = dogs['pupper'].apply(lambda x: np.nan if x == "None" else x)`
`dogs['floofer'] = dogs['floofer'].apply(lambda x: np.nan if x == "None" else x)`
`dogs['doggo'] = dogs['doggo'].apply(lambda x: np.nan if x == "None" else x)`

In [321]: `dogs2 = dogs.dropna(axis=0, thresh=2)`

In [322]: `dogs2 = dogs2.copy()`

In [323]: `#join the values from the four columns to a dog_age column`
`dogs2['dog_age'] = dogs2[['puppo', 'pupper', 'floofer', 'doggo']].astype(str).agg(',`

```
In [324]: dogs2.head()

Out[324]:             tweet_id    puppo  pupper floofer  doggo              dog_age
          9   890240255349198849    NaN     NaN    NaN   doggo    nan,nan,nan,doggo
          12  889665388333682689   puppo    NaN    NaN    NaN     puppo,nan,nan,nan
          14  889531135344209921   puppo    NaN    NaN    NaN     puppo,nan,nan,nan
          29  886366144734445568    NaN   pupper   NaN    NaN     nan,pupper,nan,nan
          43  884162670584377345    NaN     NaN    NaN   doggo    nan,nan,nan,doggo

In [325]: dogs2.dog_age.value_counts()

Out[325]: nan,pupper,nan,nan     245
          nan,nan,nan,doggo       83
          puppo,nan,nan,nan       29
          nan,pupper,nan,doggo    12
          nan,nan,floofer,nan      9
          puppo,nan,nan,doggo      1
          nan,nan,floofer,doggo    1
          Name: dog_age, dtype: int64

In [326]: #remove first batch of nans
          dogs2['dog_age'] = dogs2['dog_age'].apply(lambda x: x.replace('nan,', ''))

In [327]: dogs2.dog_age.value_counts()

Out[327]: pupper,nan      245
          doggo            83
          puppo,nan        29
          pupper,doggo     12
          floofer,nan       9
          floofer,doggo     1
          puppo,doggo       1
          Name: dog_age, dtype: int64

In [328]: #remove even more nans
          dogs2['dog_age'] = dogs2['dog_age'].apply(lambda x: x.replace(',nan', ''))

In [329]: dogs2.dog_age.value_counts()

Out[329]: pupper          245
          doggo            83
          puppo            29
          pupper,doggo     12
          floofer           9
          floofer,doggo     1
          puppo,doggo       1
          Name: dog_age, dtype: int64

In [330]: #drop all columns except for tweet_id and dog_age for the merger
          dogs3 = dogs2[['tweet_id','dog_age']]
```

```
In [331]: dogs3.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 380 entries, 9 to 2017
Data columns (total 2 columns):
tweet_id    380 non-null int64
dog_age     380 non-null object
dtypes: int64(1), object(1)
memory usage: 8.9+ KB
```

```
In [332]: #merge the dog_age column on the master df
          df_clean4 = pd.merge(df_clean, dogs3, how='left', on='tweet_id')
```

Issue 5 + 6 : Test

```
In [333]: df_clean4.dog_age.value_counts()

Out[333]: pupper          203
          doggo            62
          puppo            22
          pupper,doggo      9
          floofer           7
          floofer,doggo     1
          puppo,doggo       1
          Name: dog_age, dtype: int64
```

```
In [334]: df_clean4

Out[334]:            tweet_id                    timestamp  \
          0    892420643555336193  2017-08-01 16:23:56 +0000
          1    892177421306343426  2017-08-01 00:17:27 +0000
          2    891815181378084864  2017-07-31 00:18:03 +0000
          3    891689557279858688  2017-07-30 15:58:51 +0000
          4    891327558926688256  2017-07-29 16:00:24 +0000
          5    891087950875897856  2017-07-29 00:08:17 +0000
          6    890971913173991426  2017-07-28 16:27:12 +0000
          7    890729181411237888  2017-07-28 00:22:40 +0000
          8    890609185150312448  2017-07-27 16:25:51 +0000
          9    890240255349198849  2017-07-26 15:59:51 +0000
          10   890006608113172480  2017-07-26 00:31:25 +0000
          11   889880896479866881  2017-07-25 16:11:53 +0000
          12   889665388333682689  2017-07-25 01:55:32 +0000
          13   889638837579907072  2017-07-25 00:10:02 +0000
          14   889531135344209921  2017-07-24 17:02:04 +0000
          15   889278841981685760  2017-07-24 00:19:32 +0000
          16   888917238123831296  2017-07-23 00:22:39 +0000
          17   888804989199671297  2017-07-22 16:56:37 +0000
          18   888554962724278272  2017-07-22 00:23:06 +0000
```

```
19      888078434458587136   2017-07-20 16:49:33 +0000
20      887705289381826560   2017-07-19 16:06:48 +0000
21      887517139158093824   2017-07-19 03:39:09 +0000
22      887473957103951883   2017-07-19 00:47:34 +0000
23      887343217045368832   2017-07-18 16:08:03 +0000
24      887101392804085760   2017-07-18 00:07:08 +0000
25      886983233522544640   2017-07-17 16:17:36 +0000
26      886736880519319552   2017-07-16 23:58:41 +0000
27      886680336477933568   2017-07-16 20:14:00 +0000
28      886366144734445568   2017-07-15 23:25:31 +0000
29      886258384151887873   2017-07-15 16:17:19 +0000
...                   ...                              ...
1957    666411507551481857   2015-11-17 00:24:19 +0000
1958    666407126856765440   2015-11-17 00:06:54 +0000
1959    666396247373291520   2015-11-16 23:23:41 +0000
1960    666373753744588802   2015-11-16 21:54:18 +0000
1961    666362758909284353   2015-11-16 21:10:36 +0000
1962    666353288456101888   2015-11-16 20:32:58 +0000
1963    666345417576210432   2015-11-16 20:01:42 +0000
1964    666337882303524864   2015-11-16 19:31:45 +0000
1965    666293911632134144   2015-11-16 16:37:02 +0000
1966    666287406224695296   2015-11-16 16:11:11 +0000
1967    666273097616637952   2015-11-16 15:14:19 +0000
1968    666268910803644416   2015-11-16 14:57:41 +0000
1969    666104133288665088   2015-11-16 04:02:55 +0000
1970    666102155909144576   2015-11-16 03:55:04 +0000
1971    666099513787052032   2015-11-16 03:44:34 +0000
1972    666094000022159362   2015-11-16 03:22:39 +0000
1973    666082916733198337   2015-11-16 02:38:37 +0000
1974    666073100786774016   2015-11-16 01:59:36 +0000
1975    666071193221509120   2015-11-16 01:52:02 +0000
1976    666063827256086533   2015-11-16 01:22:45 +0000
1977    666058600524156928   2015-11-16 01:01:59 +0000
1978    666057090499244032   2015-11-16 00:55:59 +0000
1979    666055525042405380   2015-11-16 00:49:46 +0000
1980    666051853826850816   2015-11-16 00:35:11 +0000
1981    666050758794694657   2015-11-16 00:30:50 +0000
1982    666049248165822465   2015-11-16 00:24:50 +0000
1983    666044226329800704   2015-11-16 00:04:52 +0000
1984    666033412701032449   2015-11-15 23:21:54 +0000
1985    666029285002620928   2015-11-15 23:05:30 +0000
1986    666020888022790149   2015-11-15 22:32:08 +0000


0       This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut.
1       This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, sh
2       This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass.
3       This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us
```

```
4      This is Franklin. He would like you to stop calling him "cute." He is a very fie
5      Here we have a majestic great white breaching off South Africa's coast. Absolute
6      Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax
7      When you watch your owner call another dog a good boy but then they turn back to
8      This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be a
9      This is Cassie. She is a college pup. Studying international doggo communication
10     This is Koda. He is a South Australian deckshark. Deceptively deadly. Frightenin
11     This is Bruno. He is a service shark. Only gets out of the water to assist you.
12     Here's a puppo that seems to be on the fence about something haha no but serious
13     This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 w
14     This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bone
15     This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pl
16     This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 fo
17     This is Zeke. He has a new stick. Very proud of it. Would like you to throw it f
18     This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirati
19     This is Gerald. He was just told he didn't get the job he interviewed for. A h*c
20     This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boo
21     I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-ins
22     This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/
23     You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
24     This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
25     This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an env
26     This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but he
27     This is Derek. He's late for a dog meeting. 13/10 pet...al to the metal https://
28     This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Ge
29     This is Waffles. His doggles are pupside down. Unsure how to fix. 13/10 someone
...
1957   This is quite the dog. Gets really excited when not in water. Not very soft tho.
1958   This is a southern Vesuvius bumblegruff. Can drive a truck (wow). Made friends w
1959   Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (
1960   Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEy
1961   Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short leg
1962   Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Bi
1963   Look at this jokester thinking seat belt laws don't apply to him. Great tongue t
1964   This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ver
1965   This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat h
1966   This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood flo
1967   Can take selfies 11/10 https://t.co/ws2AMaNwPW
1968   Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIik
1969   Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpri
1970   Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world is
1971   Can stand on stump for what seems like a while. Built that birdhouse? Impressive
1972   This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confirm
1973   Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1
1974   Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camo
1975   Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good to
1976   This is the happiest dog you will ever see. Very committed owner. Nice couch. 10
1977   Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drin
```

```
1978   My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather do
1979   Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would d
1980   This is an odd dog. Hard on the outside but loving on the inside. Petting still
1981   This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Priv
1982   Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
1983   This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like h
1984   Here is a very happy pup. Big fan of well-maintained decks. Just look at that to
1985   This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs he
1986   Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxi

      rating_numerator  rating_denominator      name  retweet_count  \
0     13                10                   Phineas  7723
1     13                10                   Tilly    5712
2     12                10                   Archie   3786
3     13                10                   Darla    7878
4     12                10                   Franklin 8498
5     13                10                   None     2847
6     13                10                   Jax      1854
7     13                10                   None     17233
8     13                10                   Zoey     3921
9     14                10                   Cassie   6710
10    13                10                   Koda     6699
11    13                10                   Bruno    4559
12    13                10                   None     9150
13    12                10                   Ted      4101
14    13                10                   Stuart   2061
15    13                10                   Oliver   4870
16    12                10                   Jim      4113
17    13                10                   Zeke     3877
18    13                10                   Ralphus  3183
19    12                10                   Gerald   3164
20    13                10                   Jeffrey  4916
21    14                10                   such     10761
22    13                10                   Canela   16448
23    13                10                   None     9563
24    12                10                   None     5449
25    13                10                   Maya     7014
26    13                10                   Mingus   2937
27    13                10                   Derek    4085
28    12                10                   Roscoe   2895
29    13                10                   Waffles  5768
...   ..                ..                        ...    ...
1957  2                 10                   quite    301
1958  7                 10                   a        32
1959  9                 10                   None     76
1960  11                10                   None     84
1961  6                 10                   None     520
1962  8                 10                   None     66
```

```
1963  10              10              None      128
1964  9               10              an        84
1965  3               10              a         321
1966  1               2               an        62
1967  11              10              None      73
1968  10              10              None      32
1969  1               10              None      6001
1970  11              10              None      11
1971  8               10              None      60
1972  9               10              None      67
1973  6               10              None      41
1974  10              10              None      147
1975  9               10              None      53
1976  10              10              the       198
1977  8               10              the       54
1978  9               10              a         127
1979  10              10              a         221
1980  2               10              an        778
1981  10              10              a         51
1982  5               10              None      39
1983  6               10              a         132
1984  9               10              a         41
1985  7               10              a         42
1986  8               10              None      462

      favorite_count  \
0     36278
1     31282
2     23552
3     39566
4     37793
5     19040
6     11083
7     61132
8     26196
9     29926
10    28811
11    26210
12    45129
13    25406
14    14209
15    23666
16    27349
17    24039
18    18557
19    20458
20    28404
21    43587
```

```
22    64604
23    31619
24    28771
25    32825
26    11260
27    21116
28    19871
29    26310
...      ...
1957  413
1958  100
1959  159
1960  174
1961  727
1962  199
1963  275
1964  182
1965  468
1966  138
1967  161
1968  95
1969  13682
1970  72
1971  143
1972  154
1973  103
1974  297
1975  136
1976  447
1977  105
1978  270
1979  410
1980  1129
1981  125
1982  96
1983  272
1984  112
1985  121
1986  2417


0     https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg
1     https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2     https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
3     https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
4     https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
5     https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
6     https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
```

```
7     https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
8     https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
9     https://pbs.twimg.com/media/DFrEyVuW0AAO3t9.jpg
10    https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
11    https://pbs.twimg.com/media/DFl99B1WsAITKsg.jpg
12    https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
13    https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg
14    https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg
15    https://pbs.twimg.com/ext_tw_video_thumb/889278779352338437/pu/img/VlbFB3v8H8Vwz
16    https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg
17    https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
18    https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg
19    https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg
20    https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg
21    https://pbs.twimg.com/ext_tw_video_thumb/887517108413886465/pu/img/WanJKwssZj4VJ
22    https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
23    https://pbs.twimg.com/ext_tw_video_thumb/887343120832229379/pu/img/6HSuFrW1lzI_9
24    https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
25    https://pbs.twimg.com/media/DE8yicJW0AAAvBJ.jpg
26    https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg
27    https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg
28    https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg
29    https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg
...                                              ...
1957  https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
1958  https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
1959  https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
1960  https://pbs.twimg.com/media/CT9vZEYWUAAlZ05.jpg
1961  https://pbs.twimg.com/media/CT9lXGsUcAAyUFt.jpg
1962  https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg
1963  https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
1964  https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg
1965  https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg
1966  https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
1967  https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg
1968  https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg
1969  https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg
1970  https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg
1971  https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg
1972  https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
1973  https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
1974  https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
1975  https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg
1976  https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
1977  https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
1978  https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg
1979  https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
1980  https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
```

```
1981    https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
1982    https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
1983    https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
1984    https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
1985    https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
1986    https://pbs.twimg.com/media/CT4udnOWwAAOaMy.jpg

                               p1    p1_conf  p1_dog                        p2  \
0     orange                        0.097049  False   bagel
1     Chihuahua                     0.323581  True    Pekinese
2     Chihuahua                     0.716012  True    malamute
3     paper_towel                   0.170278  False   Labrador_retriever
4     basset                        0.555712  True    English_springer
5     Chesapeake_Bay_retriever      0.425595  True    Irish_terrier
6     Appenzeller                   0.341703  True    Border_collie
7     Pomeranian                    0.566142  True    Eskimo_dog
8     Irish_terrier                 0.487574  True    Irish_setter
9     Pembroke                      0.511319  True    Cardigan
10    Samoyed                       0.957979  True    Pomeranian
11    French_bulldog                0.377417  True    Labrador_retriever
12    Pembroke                      0.966327  True    Cardigan
13    French_bulldog                0.991650  True    boxer
14    golden_retriever              0.953442  True    Labrador_retriever
15    whippet                       0.626152  True    borzoi
16    golden_retriever              0.714719  True    Tibetan_mastiff
17    golden_retriever              0.469760  True    Labrador_retriever
18    Siberian_husky                0.700377  True    Eskimo_dog
19    French_bulldog                0.995026  True    pug
20    basset                        0.821664  True    redbone
21    limousine                     0.130432  False   tow_truck
22    Pembroke                      0.809197  True    Rhodesian_ridgeback
23    Mexican_hairless              0.330741  True    sea_lion
24    Samoyed                       0.733942  True    Eskimo_dog
25    Chihuahua                     0.793469  True    toy_terrier
26    kuvasz                        0.309706  True    Great_Pyrenees
27    convertible                   0.738995  False   sports_car
28    French_bulldog                0.999201  True    Chihuahua
29    pug                           0.943575  True    shower_cap
...   ...                                ...  ...                        ...
1957  coho                          0.404640  False   barracouta
1958  black-and-tan_coonhound       0.529139  True    bloodhound
1959  Chihuahua                     0.978108  True    toy_terrier
1960  soft-coated_wheaten_terrier   0.326467  True    Afghan_hound
1961  guinea_pig                    0.996496  False   skunk
1962  malamute                      0.336874  True    Siberian_husky
1963  golden_retriever              0.858744  True    Chesapeake_Bay_retriever
1964  ox                            0.416669  False   Newfoundland
1965  three-toed_sloth              0.914671  False   otter

                                     75
```

```
1966  Maltese_dog              0.857531  True   toy_poodle
1967  Italian_greyhound        0.176053  True   toy_terrier
1968  desktop_computer         0.086502  False  desk
1969  hen                      0.965932  False  cock
1970  English_setter           0.298617  True   Newfoundland
1971  Lhasa                    0.582330  True   Shih-Tzu
1972  bloodhound               0.195217  True   German_shepherd
1973  pug                      0.489814  True   bull_mastiff
1974  Walker_hound             0.260857  True   English_foxhound
1975  Gordon_setter            0.503672  True   Yorkshire_terrier
1976  golden_retriever         0.775930  True   Tibetan_mastiff
1977  miniature_poodle         0.201493  True   komondor
1978  shopping_cart            0.962465  False  shopping_basket
1979  chow                     0.692517  True   Tibetan_mastiff
1980  box_turtle               0.933012  False  mud_turtle
1981  Bernese_mountain_dog     0.651137  True   English_springer
1982  miniature_pinscher       0.560311  True   Rottweiler
1983  Rhodesian_ridgeback      0.408143  True   redbone
1984  German_shepherd          0.596461  True   malinois
1985  redbone                  0.506826  True   miniature_pinscher
1986  Welsh_springer_spaniel   0.465074  True   collie

       p2_conf  p2_dog                              p3   p3_conf  p3_dog dog_age
0      0.085851  False   banana                          0.076110  False  NaN
1      0.090647  True    papillon                        0.068957  True   NaN
2      0.078253  True    kelpie                          0.031379  True   NaN
3      0.168086  True    spatula                         0.040836  False  NaN
4      0.225770  True    German_short-haired_pointer     0.175219  True   NaN
5      0.116317  True    Indian_elephant                 0.076902  False  NaN
6      0.199287  True    ice_lolly                       0.193548  False  NaN
7      0.178406  True    Pembroke                        0.076507  True   NaN
8      0.193054  True    Chesapeake_Bay_retriever        0.118184  True   NaN
9      0.451038  True    Chihuahua                       0.029248  True   doggo
10     0.013884  True    chow                            0.008167  True   NaN
11     0.151317  True    muzzle                          0.082981  False  NaN
12     0.027356  True    basenji                         0.004633  True   puppo
13     0.002129  True    Staffordshire_bullterrier       0.001498  True   NaN
14     0.013834  True    redbone                         0.007958  True   puppo
15     0.194742  True    Saluki                          0.027351  True   NaN
16     0.120184  True    Labrador_retriever              0.105506  True   NaN
17     0.184172  True    English_setter                  0.073482  True   NaN
18     0.166511  True    malamute                        0.111411  True   NaN
19     0.000932  True    bull_mastiff                    0.000903  True   NaN
20     0.087582  True    Weimaraner                      0.026236  True   NaN
21     0.029175  False   shopping_cart                   0.026321  False  NaN
22     0.054950  True    beagle                          0.038915  True   NaN
23     0.275645  False   Weimaraner                      0.134203  True   NaN
24     0.035029  True    Staffordshire_bullterrier       0.029705  True   NaN
```

```
     25   0.143528  True     can_opener                      0.032253  False  NaN
     26   0.186136  True     Dandie_Dinmont                  0.086346  True   NaN
     27   0.139952  False    car_wheel                       0.044173  False  NaN
     28   0.000361  True     Boston_bull                     0.000076  True   pupper
     29   0.025286  False    Siamese_cat                     0.002849  False  NaN
     ...       ...  ...      ...                                  ...  ...    ...
     1957 0.271485  False    gar                             0.189945  False  NaN
     1958 0.244220  True     flat-coated_retriever           0.173810  True   NaN
     1959 0.009397  True     papillon                        0.004577  True   NaN
     1960 0.259551  True     briard                          0.206803  True   NaN
     1961 0.002402  False    hamster                         0.000461  False  NaN
     1962 0.147655  True     Eskimo_dog                      0.093412  True   NaN
     1963 0.054787  True     Labrador_retriever              0.014241  True   NaN
     1964 0.278407  True     groenendael                     0.102643  True   NaN
     1965 0.015250  False    great_grey_owl                  0.013207  False  NaN
     1966 0.063064  True     miniature_poodle                0.025581  True   NaN
     1967 0.111884  True     basenji                         0.111152  True   NaN
     1968 0.085547  False    bookcase                        0.079480  False  NaN
     1969 0.033919  False    partridge                       0.000052  False  NaN
     1970 0.149842  True     borzoi                          0.133649  True   NaN
     1971 0.166192  True     Dandie_Dinmont                  0.089688  True   NaN
     1972 0.078260  True     malinois                        0.075628  True   NaN
     1973 0.404722  True     French_bulldog                  0.048960  True   NaN
     1974 0.175382  True     Ibizan_hound                    0.097471  True   NaN
     1975 0.174201  True     Pekinese                        0.109454  True   NaN
     1976 0.093718  True     Labrador_retriever              0.072427  True   NaN
     1977 0.192305  True     soft-coated_wheaten_terrier     0.082086  True   NaN
     1978 0.014594  False    golden_retriever                0.007959  True   NaN
     1979 0.058279  True     fur_coat                        0.054449  False  NaN
     1980 0.045885  False    terrapin                        0.017885  False  NaN
     1981 0.263788  True     Greater_Swiss_Mountain_dog      0.016199  True   NaN
     1982 0.243682  True     Doberman                        0.154629  True   NaN
     1983 0.360687  True     miniature_pinscher              0.222752  True   NaN
     1984 0.138584  True     bloodhound                      0.116197  True   NaN
     1985 0.074192  True     Rhodesian_ridgeback             0.072010  True   NaN
     1986 0.156665  True     Shetland_sheepdog               0.061428  True   NaN

     [1987 rows x 19 columns]

In [335]: df_clean = df_clean4
```

Issue 7 : Define

- rename nondescriptive column headers p1,p2,p3 and use breed instead of p

Issue 7 : Code

```
In [336]: df_clean = df_clean.rename(columns={'p1':'breed1','p2':'breed2','p3':'breed3',
                          'p1_conf':'breed1_conf','p2_conf':'breed2_conf','p3
```

```
'p1_dog':'breed1_dog','p2_dog':'breed2_dog','p3_dog
```

Issue 7 : Test

```
In [337]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 1987 entries, 0 to 1986
Data columns (total 19 columns):
tweet_id             1987 non-null int64
timestamp            1987 non-null object
text                 1987 non-null object
rating_numerator     1987 non-null int64
rating_denominator   1987 non-null int64
name                 1987 non-null object
retweet_count        1987 non-null int64
favorite_count       1987 non-null int64
jpg_url              1987 non-null object
breed1               1987 non-null object
breed1_conf          1987 non-null float64
breed1_dog           1987 non-null bool
breed2               1987 non-null object
breed2_conf          1987 non-null float64
breed2_dog           1987 non-null bool
breed3               1987 non-null object
breed3_conf          1987 non-null float64
breed3_dog           1987 non-null bool
dog_age              305 non-null object
dtypes: bool(3), float64(3), int64(5), object(8)
memory usage: 269.7+ KB
```

Issue 8 - 11 : Define

- check for ratings that were extracted incorrectly using regex
- extract rating numerator correcty as float
- create one column 'rating' with rating numerator and denominator as float (numerator divided by denominator)

Issue 8 - 11: Code

```
In [338]: see_rating = df_clean[df_clean.text.str.contains(r"(\d+\.\d*\/\d+)")][['text', 'rating
          see_rating

/opt/conda/lib/python3.6/site-packages/ipykernel_launcher.py:1: UserWarning: This pattern has ma
  """Entry point for launching an IPython kernel.
```

```
Out[338]:
        39    This is Bella. She hopes her smile made you smile. If not, she is also offering
        499   This is Logan, the Chow who lived. He solemnly swears he's up to lots of good. H
        548   This is Sophie. She's a Jubilant Bush Pupper. Super h*ckin rare. Appears at rand
        1368  Here we have uncovered an entire battalion of holiday puppers. Average of 11.26/

              rating_numerator
        39    5
        499   75
        548   27
        1368  26
```

Because we have only four values that are extracted not correctly, I will change them by hand.

```
In [339]: df_clean.iloc[39, 3] = 13.5
          df_clean.iloc[499, 3] =  9.75
          df_clean.iloc[548, 3] = 11.27
          df_clean.iloc[1368, 3] =  11.26
```

```
In [340]: # create new column with float rating
          df_clean['rating'] = df_clean['rating_numerator'] / df_clean['rating_denominator']
```

```
In [341]: # drop columns that are not needed anymore
          df_clean5 = df_clean.drop(columns=['rating_numerator','rating_denominator'])
```

Issue 8 - 11 : Test

```
In [342]: df_clean[df_clean['rating_numerator'] == 13.5]
```

```
Out[342]:                 tweet_id                    timestamp  \
          39  883482846933004288   2017-07-08 00:28:19 +0000


          39  This is Bella. She hopes her smile made you smile. If not, she is also offering yc

              rating_numerator  rating_denominator   name  retweet_count  \
          39  13.5                 10                Bella  9031

              favorite_count                                    jpg_url  \
          39  43053              https://pbs.twimg.com/media/DELC9dZXUAADqUk.jpg

                     breed1  breed1_conf  breed1_dog              breed2  \
          39  golden_retriever  0.943082      True       Labrador_retriever

              breed2_conf  breed2_dog  breed3  breed3_conf  breed3_dog dog_age  rating
          39  0.032409      True       kuvasz  0.005501      True         NaN    1.35
```

```
In [343]: df_clean[df_clean['rating_numerator'] == 9.75]
```

```
Out[343]:                 tweet_id                    timestamp  \
        499  786709082849828864   2016-10-13 23:23:56 +0000


        499  This is Logan, the Chow who lived. He solemnly swears he's up to lots of good. H*

             rating_numerator  rating_denominator   name  retweet_count  \
        499  9.75              10                  Logan  6251

             favorite_count                                          jpg_url  \
        499  18622             https://pbs.twimg.com/media/CurzvFTXgAA2_AP.jpg

                 breed1  breed1_conf  breed1_dog       breed2  breed2_conf  \
        499  Pomeranian  0.467321     True         Persian_cat  0.122978

             breed2_dog breed3  breed3_conf  breed3_dog dog_age  rating
        499  False      chow    0.102654     True        NaN     0.975
In [344]: df_clean[df_clean['rating_numerator'] == 11.27]

Out[344]:                 tweet_id                    timestamp  \
        548  778027034220126208   2016-09-20 00:24:34 +0000


        548  This is Sophie. She's a Jubilant Bush Pupper. Super h*ckin rare. Appears at rando

             rating_numerator  rating_denominator    name  retweet_count  \
        548  11.27             10                  Sophie  1643

             favorite_count                                          jpg_url   breed1  \
        548  6655             https://pbs.twimg.com/media/Cswbc2yWcAAVsCJ.jpg  clumber

             breed1_conf  breed1_dog         breed2  breed2_conf  breed2_dog breed3  \
        548  0.946718     True       cocker_spaniel  0.01595     True         Lhasa

             breed3_conf  breed3_dog dog_age  rating
        548  0.006519     True       pupper   1.127
In [345]: df_clean[df_clean['rating_numerator'] == 11.26]

Out[345]:                 tweet_id                    timestamp  \
        1368  680494726643068929   2015-12-25 21:06:00 +0000


        1368  Here we have uncovered an entire battalion of holiday puppers. Average of 11.26/

              rating_numerator  rating_denominator  name  retweet_count  \
        1368  11.26             10                  None  482
```

```
         favorite_count                                   jpg_url  breed1  \
1368  1711           https://pbs.twimg.com/media/CXGaVxOWAAADjhF.jpg  kuvasz


         breed1_conf  breed1_dog    breed2  breed2_conf  breed2_dog  \
1368  0.438627        True       Samoyed  0.111622       True


               breed3  breed3_conf  breed3_dog dog_age  rating
1368  Great_Pyrenees  0.064061       True          NaN    1.126
```

In [346]: df_clean5.head()

Out[346]:
```
              tweet_id               timestamp  \
0  892420643555336193  2017-08-01 16:23:56 +0000
1  892177421306343426  2017-08-01 00:17:27 +0000
2  891815181378084864  2017-07-31 00:18:03 +0000
3  891689557279858688  2017-07-30 15:58:51 +0000
4  891327558926688256  2017-07-29 16:00:24 +0000



0  This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut. 13/
1  This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, she's
2  This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass. You
3  This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us htt
4  This is Franklin. He would like you to stop calling him "cute." He is a very fierce


       name  retweet_count  favorite_count  \
0  Phineas  7723            36278
1  Tilly    5712            31282
2  Archie   3786            23552
3  Darla    7878            39566
4  Franklin 8498            37793


                                          jpg_url      breed1  breed1_conf  \
0  https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg  orange       0.097049
1  https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg  Chihuahua    0.323581
2  https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg  Chihuahua    0.716012
3  https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg  paper_towel  0.170278
4  https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg  basset       0.555712


   breed1_dog              breed2  breed2_conf  breed2_dog  \
0  False       bagel              0.085851     False
1  True        Pekinese           0.090647     True
2  True        malamute           0.078253     True
3  False       Labrador_retriever 0.168086     True
4  True        English_springer   0.225770     True


              breed3  breed3_conf  breed3_dog dog_age  rating
0  banana            0.076110     False         NaN    1.3
```

81

```
          1  papillon                   0.068957   True       NaN    1.3
          2  kelpie                     0.031379   True       NaN    1.2
          3  spatula                    0.040836   False      NaN    1.3
          4  German_short-haired_pointer  0.175219  True      NaN    1.2
```

In [347]: df_clean5.rating.value_counts()

Out[347]: 1.200000   452
          1.000000   420
          1.100000   402
          1.300000   257
          0.900000   151
          0.800000   95
          0.700000   51
          1.400000   35
          0.500000   33
          0.600000   32
          0.300000   19
          0.400000   15
          0.200000   10
          0.100000   4
          0.000000   2
          1.127000   1
          1.350000   1
          3.428571   1
          0.636364   1
          0.818182   1
          1.126000   1
          0.975000   1
          42.000000   1
          177.600000   1
          Name: rating, dtype: int64

In [348]: # just one check to see the outliers
          outliers = df_clean5[df_clean5['rating'] >= 3]
          outliers

Out[348]:   tweet_id   timestamp \
          381   810984652412424192 2016-12-19 23:06:23 +0000
          720   749981277374128128 2016-07-04 15:00:45 +0000
          1711   670842764863651840 2015-11-29 05:52:33 +0000

          381   Meet Sam. She smiles 24/7 & secretly aspires to be a reindeer. \nKeep Sam sm
          720   This is Atticus. He's quite simply America af. 1776/10 https://t.co/GRXwMxLBkh
          1711   After so many requests... here you go.\n\nGood dogg. 420/10 https://t.co/yfAAo1g

                   name retweet_count favorite_count \
          381   Sam   1469   5452
```

```
720    Atticus  2477         5144
1711   None     8344         23798


                                           jpg_url             breed1  \
381    https://pbs.twimg.com/media/C0EyPZbXAAAceSc.jpg  golden_retriever
720    https://pbs.twimg.com/media/CmgBZ7kWcAAlzFD.jpg  bow_tie
1711   https://pbs.twimg.com/media/CU9P717W4AAOlKx.jpg  microphone


       breed1_conf  breed1_dog           breed2  breed2_conf  breed2_dog  \
381    0.871342     True        Tibetan_mastiff  0.036708     True
720    0.533941     False       sunglasses       0.080822     False
1711   0.096063     False       accordion        0.094075     False


                     breed3  breed3_conf  breed3_dog dog_age      rating
381    Labrador_retriever    0.025823     True         NaN    3.428571
720    sunglass              0.050776     False        NaN  177.600000
1711   drumstick             0.061113     False        NaN   42.000000
```

In [349]: df_clean = df_clean5

Issue 12 : Define

  • Capitalize letters in entries in the breed columns

Issue 12 : Code

```
In [350]: df_clean['breed1'] = df_clean['breed1'].apply(lambda x: x.capitalize())
          df_clean['breed2'] = df_clean['breed2'].apply(lambda x: x.capitalize())
          df_clean['breed3'] = df_clean['breed3'].apply(lambda x: x.capitalize())
```

Issue 12 : Test

```
In [351]: df_clean['breed1'].value_counts()

Out[351]: Golden_retriever            139
          Labrador_retriever          93
          Pembroke                    88
          Chihuahua                   79
          Pug                         54
          Chow                        41
          Samoyed                     39
          Pomeranian                  38
          Toy_poodle                  37
          Malamute                    29
          Cocker_spaniel              27
          French_bulldog              25
          Chesapeake_bay_retriever    23
          Miniature_pinscher          22
          Seat_belt                   21
```

```
German_shepherd              20
Siberian_husky               20
Staffordshire_bullterrier    18
Teddy                        18
Eskimo_dog                   18
Maltese_dog                  18
Shetland_sheepdog            18
Beagle                       17
Shih-tzu                     17
Rottweiler                   17
Cardigan                     17
Kuvasz                       16
Italian_greyhound            16
Lakeland_terrier             16
Web_site                     15
                             ..
Madagascar_cat                1
Ice_lolly                     1
Fire_engine                   1
Walking_stick                 1
Cheetah                       1
Hotdog                        1
Desktop_computer              1
Bearskin                      1
Timber_wolf                   1
Tailed_frog                   1
Black-footed_ferret           1
Fiddler_crab                  1
Quilt                         1
Lorikeet                      1
Three-toed_sloth              1
Carousel                      1
Bookcase                      1
Swab                          1
Coil                          1
Long-horned_beetle            1
Sundial                       1
Peacock                       1
Water_bottle                  1
Scotch_terrier                1
Lynx                          1
Canoe                         1
Cowboy_boot                   1
Bonnet                        1
Rotisserie                    1
Dining_table                  1
Name: breed1, Length: 374, dtype: int64
```

Issue 13 : Define

- search for names that are None
- search for names that are lowercase (exctracted incorrecty) using regex
- extract everything that is followed by "named" and "name is" to get correct names
- set all other issues to "None"

Issue 13: Code

```
In [352]: none_names = df_clean[df_clean['name'] == 'None']
          none_names
```

```
Out[352]:                 tweet_id                     timestamp  \
          5      891087950875897856  2017-07-29 00:08:17 +0000
          7      890729181411237888  2017-07-28 00:22:40 +0000
          12     889665388333682689  2017-07-25 01:55:32 +0000
          23     887343217045368832  2017-07-18 16:08:03 +0000
          24     887101392804085760  2017-07-18 00:07:08 +0000
          32     885167619883638784  2017-07-12 16:03:00 +0000
          36     884441805382717440  2017-07-10 15:58:53 +0000
          41     883117836046086144  2017-07-07 00:17:54 +0000
          52     880872448815771648  2017-06-30 19:35:32 +0000
          55     880095782870896641  2017-06-28 16:09:20 +0000
          74     875021211251597312  2017-06-14 16:04:48 +0000
          77     874057562936811520  2017-06-12 00:15:36 +0000
          79     873580283840344065  2017-06-10 16:39:04 +0000
          81     872967104147763200  2017-06-09 00:02:31 +0000
          82     872820683541237760  2017-06-08 14:20:41 +0000
          84     872486979161796608  2017-06-07 16:14:40 +0000
          90     870804317367881728  2017-06-03 00:48:22 +0000
          100    868622495443632128  2017-05-28 00:18:35 +0000
          102    867900495410671616  2017-05-26 00:29:37 +0000
          105    867051520902168576  2017-05-23 16:16:06 +0000
          112    864873206498414592  2017-05-17 16:00:15 +0000
          118    863079547188785154  2017-05-12 17:12:53 +0000
          123    862096992088072192  2017-05-10 00:08:34 +0000
          125    861288531465048066  2017-05-07 18:36:02 +0000
          130    860184849394610176  2017-05-04 17:30:24 +0000
          133    859607811541651456  2017-05-03 03:17:27 +0000
          135    859074603037188101  2017-05-01 15:58:40 +0000
          136    858843525470990336  2017-05-01 00:40:27 +0000
          141    857393404942143489  2017-04-27 00:38:11 +0000
          145    856526610513747968  2017-04-24 15:13:52 +0000
          ...                   ...                        ...
          1920   667176164155375616  2015-11-19 03:02:47 +0000
          1926   667138269671505920  2015-11-19 00:32:12 +0000
          1930   667065535570550784  2015-11-18 19:43:11 +0000
          1932   667044094246576128  2015-11-18 18:17:59 +0000
          1936   666837028449972224  2015-11-18 04:35:11 +0000
```

```
1937    666835007768551424    2015-11-18 04:27:09 +0000
1938    666826780179869698    2015-11-18 03:54:28 +0000
1941    666786068205871104    2015-11-18 01:12:41 +0000
1947    666649482315059201    2015-11-17 16:09:56 +0000
1951    666437273139982337    2015-11-17 02:06:42 +0000
1952    666435652385423360    2015-11-17 02:00:15 +0000
1953    666430724426358785    2015-11-17 01:40:41 +0000
1954    666428276349472768    2015-11-17 01:30:57 +0000
1955    666421158376562688    2015-11-17 01:02:40 +0000
1959    666396247373291520    2015-11-16 23:23:41 +0000
1960    666373753744588802    2015-11-16 21:54:18 +0000
1961    666362758909284353    2015-11-16 21:10:36 +0000
1962    666353288456101888    2015-11-16 20:32:58 +0000
1963    666345417576210432    2015-11-16 20:01:42 +0000
1967    666273097616637952    2015-11-16 15:14:19 +0000
1968    666268910803644416    2015-11-16 14:57:41 +0000
1969    666104133288665088    2015-11-16 04:02:55 +0000
1970    666102155909144576    2015-11-16 03:55:04 +0000
1971    666099513787052032    2015-11-16 03:44:34 +0000
1972    666094000022159362    2015-11-16 03:22:39 +0000
1973    666082916733198337    2015-11-16 02:38:37 +0000
1974    666073100786774016    2015-11-16 01:59:36 +0000
1975    666071193221509120    2015-11-16 01:52:02 +0000
1982    666049248165822465    2015-11-16 00:24:50 +0000
1986    666020888022790149    2015-11-15 22:32:08 +0000


5      Here we have a majestic great white breaching off South Africa's coast. Absolute
7      When you watch your owner call another dog a good boy but then they turn back to
12     Here's a puppo that seems to be on the fence about something haha no but serious
23     You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
24     This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
32     Here we have a corgi undercover as a malamute. Pawbably doing important investig
36     I present to you, Pup in Hat. Pup in Hat is great for all occasions. Extremely v
41     Please only send dogs. We don't rate mechanics, no matter how h*ckin good. Thank
52     Ugh not again. We only rate dogs. Please don't send in well-dressed  floppy-tong
55     Please don't send in photos without dogs in them. We're not @porch_rates. Insubo
74     Guys please stop sending pictures without any dogs in th- oh never mind hello ex
77     I can't believe this keeps happening. This, is a birb taking a bath. We only rat
79     We usually don't rate Deck-bound Saskatoon Black Bears, but this one is h*ckin f
81     Here's a very large dog. He has a date later. Politely asked this water person t
82     Here are my favorite #dogsatpollingstations \nMost voted for a more consistent w
84     We. Only. Rate. Dogs. Do not send in other things like this fluffy floor shark o
90     Real funny guys. Sending in a pic without a dog in it. Hilarious. We'll rate the
100    Here's a h*ckin peaceful boy. Unbothered by the comings and goings. 13/10 please
102    Unbelievable. We only rate dogs. Please don't send in non-canines like the "I" f
105    Oh my this spooked me up. We only rate dogs, not happy ghosts. Please send dogs
112    We only rate dogs. Please don't send in Jesus. We're trying to remain profession
```

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118    Ladies and gentlemen... I found Pipsy. He may have changed his name to Pablo, bu
123    We only rate dogs. Please don't send perfectly toasted marshmallows attempting t
125    HI. MY. NAME. IS. BOOMER. AND. I. WANT. TO. SAY. IT'S. H*CKIN. RIDICULOUS. THAT.
130    Here we have perhaps the wisest dog of all. Above average with light sabers. Imm
133    Sorry for the lack of posts today. I came home from school and had to spend qual
135    Here we have an exotic dog. Good at ukulele. Fashionable af. Has two more arms i
136    I have stumbled puppon a doggo painting party. They're looking to be the next Pu
141    Instead of the usual nightly dog rate, I'm sharing this story with you. Meeko is
145    THIS IS CHARLIE, MARK. HE DID JUST WANT TO SAY HI AFTER ALL. PUPGRADED TO A 14/1
...
1920   These are strange dogs. All have toupees. Long neck for dogs. In a shed of sorts
1926   Extremely intelligent dog here. Has learned to walk like human. Even has his own
1930   Here we have a Hufflepuff. Loves vest. Eyes wide af. Flaccid tail. Matches carpe
1932   12/10 gimme now https://t.co/QZAnwgnOMB
1936   My goodness. Very rare dog here. Large. Tail dangerous. Kinda fat. Only eats lea
1937   These are Peruvian Feldspars. Their names are Cupit and Prencer. Both resemble R
1938   12/10 simply brilliant pup https://t.co/V6ZzG45zzG
1941   Unfamiliar with this breed. Ears pointy af. Won't let go of seashell. Won't eat
1947   Cool dog. Enjoys couch. Low monotone bark. Very nice kicks. Pisses milk (must be
1951   Here we see a lone northeastern Cumberbatch. Half ladybug. Only builds with bric
1952   "Can you behave? You're ruining my wedding day"\nDOG: idgaf this flashlight tast
1953   Oh boy what a pup! Sunglasses take this one to the next level. Weirdly folds fro
1954   Here we have an Austrian Pulitzer. Collectors edition. Levitates (?). 7/10 would
1955   *internally screaming* 12/10 https://t.co/YMcrXC2Y6R
1959   Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (
1960   Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEy
1961   Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short leg
1962   Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Bi
1963   Look at this jokester thinking seat belt laws don't apply to him. Great tongue t
1967   Can take selfies 11/10 https://t.co/ws2AMaNwPW
1968   Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIik
1969   Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpri
1970   Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world is
1971   Can stand on stump for what seems like a while. Built that birdhouse? Impressive
1972   This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confirm
1973   Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1
1974   Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camo
1975   Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good to
1982   Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
1986   Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxi

      name    retweet_count  favorite_count  \
5     None    2847           19040
7     None    17233          61132
12    None    9150           45129
23    None    9563           31619
24    None    5449           28771
32    None    3997           20571
```

36	None	5209	25453
41	None	6070	34848
52	None	3506	20013
55	None	3974	25969
74	None	4341	24031
77	None	3664	21439
79	None	3624	22867
81	None	4999	25777
82	None	3435	13935
84	None	8347	38540
90	None	5741	31896
100	None	4949	25406
102	None	3910	23049
105	None	7381	30722
112	None	8175	30870
118	None	1048	8424
123	None	21900	71295
125	None	3918	16494
130	None	5559	16073
133	None	1488	17957
135	None	12993	32638
136	None	3325	15042
141	None	1572	5701
145	None	1803	11518
...	...	...	...
1920	None	436	584
1926	None	2082	4383
1930	None	42	161
1932	None	47	176
1936	None	526	770
1937	None	77	200
1938	None	88	243
1941	None	463	723
1947	None	584	1067
1951	None	42	117
1952	None	48	159
1953	None	178	301
1954	None	77	156
1955	None	107	301
1959	None	76	159
1960	None	84	174
1961	None	520	727
1962	None	66	199
1963	None	128	275
1967	None	73	161
1968	None	32	95
1969	None	6001	13682
1970	None	11	72

```
1971   None   60            143
1972   None   67            154
1973   None   41            103
1974   None   147           297
1975   None   53            136
1982   None   39            96
1986   None   462           2417


5      https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
7      https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
12     https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
23     https://pbs.twimg.com/ext_tw_video_thumb/887343120832229379/pu/img/6HSuFrW1lzI_9
24     https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
32     https://pbs.twimg.com/media/DEi_N9qXYAAgEEw.jpg
36     https://pbs.twimg.com/media/DEYrIZwWsAA2Wo5.jpg
41     https://pbs.twimg.com/media/DEF2-_hXoAAs62q.jpg
52     https://pbs.twimg.com/media/DDl8zzJWOAAisCJ.jpg
55     https://pbs.twimg.com/media/DDa6ckbXgAAM1vV.jpg
74     https://pbs.twimg.com/media/DCSzF3NVoAAPzT4.jpg
77     https://pbs.twimg.com/media/DCFGtdoXkAEsqIw.jpg
79     https://pbs.twimg.com/media/DB-UotKXkAEHXVi.jpg
81     https://pbs.twimg.com/media/DB1m871XUAAw5vZ.jpg
82     https://pbs.twimg.com/media/DBzhx0PWAAEhlOE.jpg
84     https://pbs.twimg.com/media/DBuyRlTUwAAYhG9.jpg
90     https://pbs.twimg.com/media/DBW35ZsVoAEWZUU.jpg
100    https://pbs.twimg.com/media/DA33iOXXsAEQtCA.jpg
102    https://pbs.twimg.com/media/DAtm5MkXoAA4R6P.jpg
105    https://pbs.twimg.com/media/DAhiwbOXcAA8x5Q.jpg
112    https://pbs.twimg.com/media/DAClmHkXcAA1kSv.jpg
118    https://pbs.twimg.com/media/C_pGRInUwAAmTY_.jpg
123    https://pbs.twimg.com/media/C_bIo7QXYAAGfPu.jpg
125    https://pbs.twimg.com/ext_tw_video_thumb/861288473281437696/pu/img/RERGmRgPyaaaB
130    https://pbs.twimg.com/media/C-_9jWWUwAAnwkd.jpg
133    https://pbs.twimg.com/media/C-3wvtxXcAUTuBE.jpg
135    https://pbs.twimg.com/media/C-wLyufWOAA546I.jpg
136    https://pbs.twimg.com/media/C-s5oYZXkAAMHHq.jpg
141    https://pbs.twimg.com/media/C-YSwA_XgAEOr25.jpg
145    https://pbs.twimg.com/media/C-L-aIYXgAIROjY.jpg
...                          ...
1920   https://pbs.twimg.com/media/CUJJLtWWsAE-go5.jpg
1926   https://pbs.twimg.com/media/CUImtzEVAAAZNJo.jpg
1930   https://pbs.twimg.com/media/CUHkkJpXIAA2w3n.jpg
1932   https://pbs.twimg.com/media/CUHREBXXAAE6A9b.jpg
1936   https://pbs.twimg.com/media/CUEUva1WsAA2jPb.jpg
1937   https://pbs.twimg.com/media/CUES51dXIAEahyG.jpg
1938   https://pbs.twimg.com/media/CUELaONUkAAscGC.jpg
1941   https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg
```

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1947    https://pbs.twimg.com/media/CUBqKnLWwAA5OQB.jpg
1951    https://pbs.twimg.com/media/CT-pKmRWIAAxUWj.jpg
1952    https://pbs.twimg.com/media/CT-nsTQWEAEkyDn.jpg
1953    https://pbs.twimg.com/media/CT-jNYqW4AAPi2M.jpg
1954    https://pbs.twimg.com/media/CT-g-0DUwAEQdSn.jpg
1955    https://pbs.twimg.com/media/CT-aggCXAAIMfT3.jpg
1959    https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
1960    https://pbs.twimg.com/media/CT9vZEYWUAAlZO5.jpg
1961    https://pbs.twimg.com/media/CT9lXGsUcAAyUFt.jpg
1962    https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg
1963    https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
1967    https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg
1968    https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg
1969    https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg
1970    https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg
1971    https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg
1972    https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
1973    https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
1974    https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
1975    https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg
1982    https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
1986    https://pbs.twimg.com/media/CT4udnOWwAAOaMy.jpg
```

	breed1	breed1_conf	breed1_dog \
5	Chesapeake_bay_retriever	0.425595	True
7	Pomeranian	0.566142	True
12	Pembroke	0.966327	True
23	Mexican_hairless	0.330741	True
24	Samoyed	0.733942	True
32	Malamute	0.812482	True
36	Pembroke	0.993225	True
41	Golden_retriever	0.949562	True
52	Pembroke	0.791416	True
55	Miniature_pinscher	0.120298	True
74	West_highland_white_terrier	0.714319	True
77	Flat-coated_retriever	0.832177	True
79	Newfoundland	0.678537	True
81	Labrador_retriever	0.476913	True
82	Pug	0.999120	True
84	Pembroke	0.931861	True
90	Home_theater	0.168290	False
100	Labrador_retriever	0.868107	True
102	Labrador_retriever	0.522644	True
105	Samoyed	0.471403	True
112	Pole	0.478616	False
118	Lakeland_terrier	0.275242	True
123	Chow	0.677589	True
125	Syringe	0.144712	False

```
130   Chimpanzee                      0.267612    False
133   Golden_retriever                0.895529    True
135   Revolver                        0.190292    False
136   Golden_retriever                0.578120    True
141   Malamute                        0.841597    True
145   Old_english_sheepdog            0.798481    True
...                        ...                      ...         ...
1920  Soft-coated_wheaten_terrier  0.318981    True
1926  West_highland_white_terrier  0.747713    True
1930  Jigsaw_puzzle                   0.560001    False
1932  Golden_retriever                0.765266    True
1936  Triceratops                     0.442113    False
1937  Airedale                        0.448459    True
1938  Maltese_dog                     0.359383    True
1941  Snail                           0.999888    False
1947  Border_collie                   0.447803    True
1951  Chihuahua                       0.671853    True
1952  Chesapeake_bay_retriever     0.184130    True
1953  Llama                           0.505184    False
1954  Pembroke                        0.371361    True
1955  Blenheim_spaniel                0.906777    True
1959  Chihuahua                       0.978108    True
1960  Soft-coated_wheaten_terrier  0.326467    True
1961  Guinea_pig                      0.996496    False
1962  Malamute                        0.336874    True
1963  Golden_retriever                0.858744    True
1967  Italian_greyhound               0.176053    True
1968  Desktop_computer                0.086502    False
1969  Hen                             0.965932    False
1970  English_setter                  0.298617    True
1971  Lhasa                           0.582330    True
1972  Bloodhound                      0.195217    True
1973  Pug                             0.489814    True
1974  Walker_hound                    0.260857    True
1975  Gordon_setter                   0.503672    True
1982  Miniature_pinscher              0.560311    True
1986  Welsh_springer_spaniel          0.465074    True

                      breed2  breed2_conf  breed2_dog  \
5     Irish_terrier              0.116317    True
7     Eskimo_dog                 0.178406    True
12    Cardigan                   0.027356    True
23    Sea_lion                   0.275645    False
24    Eskimo_dog                 0.035029    True
32    Siberian_husky             0.071712    True
36    Cardigan                   0.003216    True
41    Labrador_retriever         0.045948    True
52    Norwich_terrier            0.061393    True
```

```
55    Rhodesian_ridgeback        0.106395    True
74    Siberian_husky             0.091913    True
77    Black-and-tan_coonhound    0.040437    True
79    Tibetan_mastiff            0.244022    True
81    Chesapeake_bay_retriever   0.174145    True
82    French_bulldog             0.000552    True
84    Cardigan                   0.037721    True
90    Sandbar                    0.098040    False
100   Great_pyrenees             0.060973    True
102   Kuvasz                     0.332461    True
105   Pekinese                   0.302219    True
112   Lakeside                   0.114182    False
118   Airedale                   0.190569    True
123   Pomeranian                 0.270648    True
125   Oxygen_mask                0.106684    False
130   Gorilla                    0.104293    False
133   Irish_setter               0.024099    True
135   Projectile                 0.149064    False
136   Labrador_retriever         0.286059    True
141   Siberian_husky             0.073644    True
145   Tibetan_terrier            0.060602    True
...            ...                   ...       ...
1920  Lakeland_terrier           0.215218    True
1926  Samoyed                    0.243629    True
1930  Doormat                    0.103259    False
1932  Labrador_retriever         0.206694    True
1936  Armadillo                  0.114071    False
1937  Toy_poodle                 0.124030    True
1938  Teddy                      0.148759    False
1941  Slug                       0.000055    False
1947  English_springer           0.170497    True
1951  Beagle                     0.124680    True
1952  Chain_saw                  0.056775    False
1953  Irish_terrier              0.104109    True
1954  Chow                       0.249394    True
1955  Cocker_spaniel             0.090346    True
1959  Toy_terrier                0.009397    True
1960  Afghan_hound               0.259551    True
1961  Skunk                      0.002402    False
1962  Siberian_husky             0.147655    True
1963  Chesapeake_bay_retriever   0.054787    True
1967  Toy_terrier                0.111884    True
1968  Desk                       0.085547    False
1969  Cock                       0.033919    False
1970  Newfoundland               0.149842    True
1971  Shih-tzu                   0.166192    True
1972  German_shepherd            0.078260    True
1973  Bull_mastiff               0.404722    True
```

```
1974  English_foxhound            0.175382      True
1975  Yorkshire_terrier           0.174201      True
1982  Rottweiler                  0.243682      True
1986  Collie                      0.156665      True


                                  breed3  breed3_conf  breed3_dog  dog_age  rating
5     Indian_elephant                       0.076902      False      NaN    1.3
7     Pembroke                              0.076507      True       NaN    1.3
12    Basenji                               0.004633      True       puppo  1.3
23    Weimaraner                            0.134203      True       NaN    1.3
24    Staffordshire_bullterrier             0.029705      True       NaN    1.2
32    Eskimo_dog                            0.055770      True       NaN    1.3
36    Chihuahua                             0.002081      True       NaN    1.4
41    Kuvasz                                0.002471      True       NaN    1.3
52    Chihuahua                             0.033726      True       NaN    1.2
55    Beagle                                0.106073      True       NaN    1.1
74    Great_pyrenees                        0.046038      True       NaN    1.2
77    Newfoundland                          0.028228      True       NaN    1.2
79    Chow                                  0.048530      True       NaN    1.3
81    German_short-haired_pointer           0.092861      True       doggo  1.2
82    Bull_mastiff                          0.000073      True       NaN    1.3
84    Chihuahua                             0.011967      True       NaN    1.2
90    Television                            0.079729      False      NaN    1.1
100   Saint_bernard                         0.033489      True       NaN    1.3
102   Dalmatian                             0.032008      True       NaN    1.2
105   Pomeranian                            0.156606      True       NaN    1.3
112   Wreck                                 0.055926      False      NaN    1.4
118   Teddy                                 0.102595      False      NaN    1.4
123   Pekinese                              0.038110      True       NaN    1.3
125   Bouvier_des_flandres                  0.082610      True       NaN    1.3
130   Orangutan                             0.059908      False      NaN    1.4
133   Labrador_retriever                    0.019285      True       puppo  1.3
135   Fountain                              0.066047      False      NaN    1.3
136   Bloodhound                            0.026917      True       doggo  1.3
141   Eskimo_dog                            0.072129      True       NaN    1.3
145   Standard_poodle                       0.040722      True       NaN    1.4
...          ...                               ...         ...       ...    ...
1920  Toy_poodle                            0.106014      True       NaN    0.4
1926  Toy_poodle                            0.001804      True       NaN    1.0
1930  Space_heater                          0.042568      False      NaN    0.8
1932  Seat_belt                             0.010667      False      NaN    1.2
1936  Common_iguana                         0.043255      False      NaN    0.3
1937  Teddy                                 0.110183      False      NaN    1.0
1938  West_highland_white_terrier           0.106007      True       NaN    1.2
1941  Acorn                                 0.000026      False      NaN    0.2
1947  Collie                                0.139206      True       NaN    0.4
1951  Saluki                                0.044094      True       NaN    0.7
1952  Power_drill                           0.036763      False      NaN    1.0
```

```
1953   Dingo                     0.062071     False     NaN     0.6
1954   Pomeranian                0.241878     True      NaN     0.7
1955   Shih-tzu                  0.001117     True      NaN     1.2
1959   Papillon                  0.004577     True      NaN     0.9
1960   Briard                    0.206803     True      NaN     1.1
1961   Hamster                   0.000461     False     NaN     0.6
1962   Eskimo_dog                0.093412     True      NaN     0.8
1963   Labrador_retriever        0.014241     True      NaN     1.0
1967   Basenji                   0.111152     True      NaN     1.1
1968   Bookcase                  0.079480     False     NaN     1.0
1969   Partridge                 0.000052     False     NaN     0.1
1970   Borzoi                    0.133649     True      NaN     1.1
1971   Dandie_dinmont            0.089688     True      NaN     0.8
1972   Malinois                  0.075628     True      NaN     0.9
1973   French_bulldog            0.048960     True      NaN     0.6
1974   Ibizan_hound              0.097471     True      NaN     1.0
1975   Pekinese                  0.109454     True      NaN     0.9
1982   Doberman                  0.154629     True      NaN     0.5
1986   Shetland_sheepdog         0.061428     True      NaN     0.8

[546 rows x 18 columns]
```

After checking the tweets without names visually, I decided to keep them. Sampling through them, I have found a lot of valid photos of dogs, as well as ratings. The names here weren't extracted, because the text does not mention any name. Now let's search for the lowercase letters.

```
In [353]: # extract the rows that need to be adjusted by searching for lowercase names
          see_lower = df_clean[df_clean.name.str.contains(r"^[a-z]+")]
          see_lower = see_lower.copy()

In [354]: # exctract everything that is followed by "name" or "name is"
          see_lower['name'] = see_lower.text.str.extract('((named [A-Z][a-z]+)|(name is [A-Z][a-

In [355]: see_lower.name.value_counts()

Out[355]: named Spork        1
          named Berta        1
          named Rufus        1
          named Alphred      1
          named Wylie        1
          named Hemry        1
          named Chuk         1
          named Alfonso      1
          named Johm         1
          named Kip          1
          name is Zoey       1
          named Jessiga      1
          named Pepe         1
          named Leroi        1
```

```
        named Jacob        1
        named Alfredo      1
        named Cheryl       1
        named Cherokee     1
        name is Daryl      1
        named Kohl         1
        named Octaviath    1
        named Klint        1
        Name: name, dtype: int64
```

In [356]: `see_lower.name = see_lower.name.astype(str)`
          `see_lower.info()`

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 98 entries, 21 to 1985
Data columns (total 18 columns):
tweet_id         98 non-null int64
timestamp        98 non-null object
text             98 non-null object
name             98 non-null object
retweet_count    98 non-null int64
favorite_count   98 non-null int64
jpg_url          98 non-null object
breed1           98 non-null object
breed1_conf      98 non-null float64
breed1_dog       98 non-null bool
breed2           98 non-null object
breed2_conf      98 non-null float64
breed2_dog       98 non-null bool
breed3           98 non-null object
breed3_conf      98 non-null float64
breed3_dog       98 non-null bool
dog_age          12 non-null object
rating           98 non-null float64
dtypes: bool(3), float64(4), int64(3), object(8)
memory usage: 12.5+ KB
```

In [357]: *#remove the unnecessary "name" and "name is" and convert nans to "None"*
          `see_lower['name'] = see_lower['name'].apply(lambda x: x.replace('named ', ''))`

In [358]: `see_lower['name'] = see_lower['name'].apply(lambda x: x.replace('name is ', ''))`

In [359]: `see_lower['name'] = see_lower['name'].apply(lambda x: x.replace('nan', 'None'))`

In [360]: *#drop the rows that need to be changed*
          `df_clean6 = df_clean[~df_clean.tweet_id.isin(see_lower.tweet_id)]`

In [361]: *# concat both frames*
          `df_clean7 = pd.concat([df_clean6, see_lower])`

Issue 13: Test

```
In [362]: # check if all everything was replaced correctly
          see_lower.name.value_counts()
```

```
Out[362]: None          76
          Alfredo        1
          Jessiga        1
          Spork          1
          Jacob          1
          Klint          1
          Berta          1
          Alphred        1
          Kohl           1
          Hemry          1
          Wylie          1
          Cherokee       1
          Octaviath      1
          Cheryl         1
          Kip            1
          Pepe           1
          Daryl          1
          Zoey           1
          Leroi          1
          Chuk           1
          Alfonso        1
          Johm           1
          Rufus          1
          Name: name, dtype: int64
```

```
In [363]: see_lower.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 98 entries, 21 to 1985
Data columns (total 18 columns):
tweet_id          98 non-null int64
timestamp         98 non-null object
text              98 non-null object
name              98 non-null object
retweet_count     98 non-null int64
favorite_count    98 non-null int64
jpg_url           98 non-null object
breed1            98 non-null object
breed1_conf       98 non-null float64
breed1_dog        98 non-null bool
breed2            98 non-null object
breed2_conf       98 non-null float64
breed2_dog        98 non-null bool
breed3            98 non-null object
```

```
breed3_conf        98 non-null float64
breed3_dog         98 non-null bool
dog_age            12 non-null object
rating             98 non-null float64
dtypes: bool(3), float64(4), int64(3), object(8)
memory usage: 12.5+ KB
```

In [364]: df_clean7

Out[364]:   tweet_id   timestamp \
         0   892420643555336193   2017-08-01 16:23:56 +0000
         1   892177421306343426   2017-08-01 00:17:27 +0000
         2   891815181378084864   2017-07-31 00:18:03 +0000
         3   891689557279858688   2017-07-30 15:58:51 +0000
         4   891327558926688256   2017-07-29 16:00:24 +0000
         5   891087950875897856   2017-07-29 00:08:17 +0000
         6   890971913173991426   2017-07-28 16:27:12 +0000
         7   890729181411237888   2017-07-28 00:22:40 +0000
         8   890609185150312448   2017-07-27 16:25:51 +0000
         9   890240255349198849   2017-07-26 15:59:51 +0000
         10   890006608113172480   2017-07-26 00:31:25 +0000
         11   889880896479866881   2017-07-25 16:11:53 +0000
         12   889665388333682689   2017-07-25 01:55:32 +0000
         13   889638837579907072   2017-07-25 00:10:02 +0000
         14   889531135344209921   2017-07-24 17:02:04 +0000
         15   889278841981685760   2017-07-24 00:19:32 +0000
         16   888917238123831296   2017-07-23 00:22:39 +0000
         17   888804989199671297   2017-07-22 16:56:37 +0000
         18   888554962724278272   2017-07-22 00:23:06 +0000
         19   888078434458587136   2017-07-20 16:49:33 +0000
         20   887705289381826560   2017-07-19 16:06:48 +0000
         22   887473957103951883   2017-07-19 00:47:34 +0000
         23   887343217045368832   2017-07-18 16:08:03 +0000
         24   887101392804085760   2017-07-18 00:07:08 +0000
         25   886983233522544640   2017-07-17 16:17:36 +0000
         26   886736880519319552   2017-07-16 23:58:41 +0000
         27   886680336477933568   2017-07-16 20:14:00 +0000
         28   886366144734445568   2017-07-15 23:25:31 +0000
         29   886258384151887873   2017-07-15 16:17:19 +0000
         30   885984800019947520   2017-07-14 22:10:11 +0000
         ...   .
         1797 669564461267722241   2015-11-25 17:13:02 +0000
         1826 668955713004314625   2015-11-24 00:54:05 +0000
         1833 668815180734689280   2015-11-23 15:35:39 +0000
         1839 668636665813057536   2015-11-23 03:46:18 +0000
         1846 668614819948453888   2015-11-23 02:19:29 +0000
         1852 668507509523615744   2015-11-22 19:13:05 +0000
```

```
1856   668466899341221888   2015-11-22 16:31:42 +0000
1869   668171859951755264   2015-11-21 20:59:20 +0000
1883   667861340749471744   2015-11-21 00:25:26 +0000
1889   667773195014021121   2015-11-20 18:35:10 +0000
1896   667538891197542400   2015-11-20 03:04:08 +0000
1905   667470559035432960   2015-11-19 22:32:36 +0000
1919   667177989038297088   2015-11-19 03:10:02 +0000
1935   666983947667116034   2015-11-18 14:18:59 +0000
1942   666781792255496192   2015-11-18 00:55:42 +0000
1945   666701168228331520   2015-11-17 19:35:19 +0000
1957   666411507551481857   2015-11-17 00:24:19 +0000
1958   666407126856765440   2015-11-17 00:06:54 +0000
1964   666337882303524864   2015-11-16 19:31:45 +0000
1965   666293911632134144   2015-11-16 16:37:02 +0000
1966   666287406224695296   2015-11-16 16:11:11 +0000
1976   666063827256086533   2015-11-16 01:22:45 +0000
1977   666058600524156928   2015-11-16 01:01:59 +0000
1978   666057090499244032   2015-11-16 00:55:59 +0000
1979   666055525042405380   2015-11-16 00:49:46 +0000
1980   666051853826850816   2015-11-16 00:35:11 +0000
1981   666050758794694657   2015-11-16 00:30:50 +0000
1983   666044226329800704   2015-11-16 00:04:52 +0000
1984   666033412701032449   2015-11-15 23:21:54 +0000
1985   666029285002620928   2015-11-15 23:05:30 +0000
```

```
0     This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut.
1     This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, sh
2     This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass.
3     This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us
4     This is Franklin. He would like you to stop calling him "cute." He is a very fie
5     Here we have a majestic great white breaching off South Africa's coast. Absolute
6     Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax
7     When you watch your owner call another dog a good boy but then they turn back to
8     This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be a
9     This is Cassie. She is a college pup. Studying international doggo communication
10    This is Koda. He is a South Australian deckshark. Deceptively deadly. Frightenin
11    This is Bruno. He is a service shark. Only gets out of the water to assist you.
12    Here's a puppo that seems to be on the fence about something haha no but serious
13    This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 w
14    This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bone
15    This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pl
16    This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 fo
17    This is Zeke. He has a new stick. Very proud of it. Would like you to throw it f
18    This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirati
19    This is Gerald. He was just told he didn't get the job he interviewed for. A h*c
20    This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boo
22    This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/
```

```
23    You may not have known you needed to see this today. 13/10 please enjoy (IG: emm
24    This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send
25    This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an env
26    This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but he
27    This is Derek. He's late for a dog meeting. 13/10 pet...al to the metal https://
28    This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Ge
29    This is Waffles. His doggles are pupside down. Unsure how to fix. 13/10 someone
30    Viewer discretion advised. This is Jimbo. He will rip ur finger right h*ckin off
...
1797  This is a Coriander Baton Rouge named Alfredo. Loves to cuddle with smaller well
1826  This is a Slovakian Helter Skelter Feta named Leroi. Likes to skip on roofs. Goo
1833  This is a wild Toblerone from Papua New Guinea. Mouth always open. Addicted to h
1839  This is an Irish Rigatoni terrier named Berta. Completely made of rope. No eyes.
1846  Here is a horned dog. Much grace. Can jump over moons (dam!). Paws not soft. Bad
1852  This is a Birmingham Quagmire named Chuk. Loves to relax and watch the game whil
1856  Here is a mother dog caring for her pups. Snazzy red mohawk. Doesn't wag tail. P
1869  This is a Trans Siberian Kellogg named Alfonso. Huge ass eyeballs. Actually Dobb
1883  This is a Shotokon Macadamia mix named Cheryl. Sophisticated af. Looks like a di
1889  This is a rare Hungarian Pinot named Jessiga. She is either mid-stroke or got st
1896  This is a southwest Coriander named Klint. Hat looks expensive. Still on house a
1905  This is a northern Wahoo named Kohl. He runs this town. Chases tumbleweeds. Draw
1919  This is a Dasani Kingfisher from Maine. His name is Daryl. Daryl doesn't like be
1935  This is a curly Ticonderoga named Pepe. No feet. Loves to jet ski. 11/10 would h
1942  This is a purebred Bacardi named Octaviath. Can shoot spaghetti out of mouth. 10
1945  This is a golden Buckminsterfullerene named Johm. Drives trucks. Lumberjack (?).
1957  This is quite the dog. Gets really excited when not in water. Not very soft tho.
1958  This is a southern Vesuvius bumblegruff. Can drive a truck (wow). Made friends w
1964  This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ver
1965  This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat h
1966  This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood flo
1976  This is the happiest dog you will ever see. Very committed owner. Nice couch. 10
1977  Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drin
1978  My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather do
1979  Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would d
1980  This is an odd dog. Hard on the outside but loving on the inside. Petting still
1981  This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Priv
1983  This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like h
1984  Here is a very happy pup. Big fan of well-maintained decks. Just look at that to
1985  This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs he

          name  retweet_count  favorite_count  \
0      Phineas  7723           36278
1      Tilly    5712           31282
2      Archie   3786           23552
3      Darla    7878           39566
4      Franklin 8498           37793
5      None     2847           19040
6      Jax      1854           11083
```

7	None	17233	61132
8	Zoey	3921	26196
9	Cassie	6710	29926
10	Koda	6699	28811
11	Bruno	4559	26210
12	None	9150	45129
13	Ted	4101	25406
14	Stuart	2061	14209
15	Oliver	4870	23666
16	Jim	4113	27349
17	Zeke	3877	24039
18	Ralphus	3183	18557
19	Gerald	3164	20458
20	Jeffrey	4916	28404
22	Canela	16448	64604
23	None	9563	31619
24	None	5449	28771
25	Maya	7014	32825
26	Mingus	2937	11260
27	Derek	4085	21116
28	Roscoe	2895	19871
29	Waffles	5768	26310
30	Jimbo	6140	30589
...	...	...	...
1797	Alfredo	118	375
1826	Leroi	68	266
1833	None	253	542
1839	Berta	474	1007
1846	None	305	597
1852	Chuk	101	312
1856	None	492	859
1869	Alfonso	184	465
1883	Cheryl	74	235
1889	Jessiga	52	226
1896	Klint	62	197
1905	Kohl	90	245
1919	Daryl	51	184
1935	Pepe	929	2437
1942	Octaviath	180	367
1945	Johm	206	408
1957	None	301	413
1958	None	32	100
1964	None	84	182
1965	None	321	468
1966	None	62	138
1976	None	198	447
1977	None	54	105
1978	None	127	270

```
1979    None        221             410
1980    None        778             1129
1981    None        51              125
1983    None        132             272
1984    None        41              112
1985    None        42              121


0       https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg
1       https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2       https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
3       https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
4       https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
5       https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
6       https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
7       https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
8       https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
9       https://pbs.twimg.com/media/DFrEyVuW0AAO3t9.jpg
10      https://pbs.twimg.com/media/DFnwSY4WAAAM1iS.jpg
11      https://pbs.twimg.com/media/DFl99B1WsAITKsg.jpg
12      https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
13      https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg
14      https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg
15      https://pbs.twimg.com/ext_tw_video_thumb/889278779352338437/pu/img/VlbFB3v8H8Vwz
16      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg
17      https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
18      https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg
19      https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg
20      https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg
22      https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
23      https://pbs.twimg.com/ext_tw_video_thumb/887343120832229379/pu/img/6HSuFrW1lzI_9
24      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
25      https://pbs.twimg.com/media/DE8yicJW0AAAvBJ.jpg
26      https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg
27      https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg
28      https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg
29      https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg
30      https://pbs.twimg.com/media/DEumeWWV0AA-Z61.jpg
...                             ...
1797    https://pbs.twimg.com/media/CUrFUvDVAAA9H-F.jpg
1826    https://pbs.twimg.com/media/CUibq3uVAAAup_O.jpg
1833    https://pbs.twimg.com/media/CUgb21RXIAAlff7.jpg
1839    https://pbs.twimg.com/media/CUd5gBGWwAAOIVA.jpg
1846    https://pbs.twimg.com/media/CUdloW8WEAAxB_Y.jpg
1852    https://pbs.twimg.com/media/CUcECBYWcAAzFRg.jpg
1856    https://pbs.twimg.com/media/CUbfGbbWoAApZth.jpg
1869    https://pbs.twimg.com/media/CUXSwy8W4AA6uet.jpg
1883    https://pbs.twimg.com/media/CUS4WJ-UsAEJj10.jpg
```

```
1889    https://pbs.twimg.com/media/CURoLrOVEAAaWdR.jpg
1896    https://pbs.twimg.com/media/CUOTFZOW4AABsfW.jpg
1905    https://pbs.twimg.com/media/CUNU78YWEAECmpB.jpg
1919    https://pbs.twimg.com/media/CUJK18UWEAEg7AR.jpg
1935    https://pbs.twimg.com/media/CUGaXDhW4AY9JUH.jpg
1942    https://pbs.twimg.com/media/CUDigRXXIAATI_H.jpg
1945    https://pbs.twimg.com/media/CUCZLH1UAAAeAig.jpg
1957    https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
1958    https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
1964    https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg
1965    https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg
1966    https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
1976    https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
1977    https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
1978    https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg
1979    https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
1980    https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
1981    https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
1983    https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
1984    https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
1985    https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg


                           breed1  breed1_conf  breed1_dog  \
0     Orange                        0.097049    False
1     Chihuahua                     0.323581    True
2     Chihuahua                     0.716012    True
3     Paper_towel                   0.170278    False
4     Basset                        0.555712    True
5     Chesapeake_bay_retriever      0.425595    True
6     Appenzeller                   0.341703    True
7     Pomeranian                    0.566142    True
8     Irish_terrier                 0.487574    True
9     Pembroke                      0.511319    True
10    Samoyed                       0.957979    True
11    French_bulldog                0.377417    True
12    Pembroke                      0.966327    True
13    French_bulldog                0.991650    True
14    Golden_retriever              0.953442    True
15    Whippet                       0.626152    True
16    Golden_retriever              0.714719    True
17    Golden_retriever              0.469760    True
18    Siberian_husky                0.700377    True
19    French_bulldog                0.995026    True
20    Basset                        0.821664    True
22    Pembroke                      0.809197    True
23    Mexican_hairless              0.330741    True
24    Samoyed                       0.733942    True
25    Chihuahua                     0.793469    True
```

```
26     Kuvasz                       0.309706    True
27     Convertible                  0.738995    False
28     French_bulldog               0.999201    True
29     Pug                          0.943575    True
30     Blenheim_spaniel             0.972494    True
...             ...                       ...      ...
1797   Toy_poodle                   0.623685    True
1826   Cocker_spaniel               0.367492    True
1833   Redbone                      0.461172    True
1839   Komondor                     0.999956    True
1846   Bustard                      0.380772    False
1852   Basenji                      0.055379    True
1856   Shopping_basket              0.398361    False
1869   Chihuahua                    0.664834    True
1883   Malamute                     0.967275    True
1889   West_highland_white_terrier  0.360465    True
1896   Yorkshire_terrier            0.618957    True
1905   Toy_poodle                   0.304175    True
1919   Vizsla                       0.259249    True
1935   Swab                         0.589446    False
1942   Italian_greyhound            0.618316    True
1945   Labrador_retriever           0.887707    True
1957   Coho                         0.404640    False
1958   Black-and-tan_coonhound      0.529139    True
1964   Ox                           0.416669    False
1965   Three-toed_sloth             0.914671    False
1966   Maltese_dog                  0.857531    True
1976   Golden_retriever             0.775930    True
1977   Miniature_poodle             0.201493    True
1978   Shopping_cart                0.962465    False
1979   Chow                         0.692517    True
1980   Box_turtle                   0.933012    False
1981   Bernese_mountain_dog         0.651137    True
1983   Rhodesian_ridgeback          0.408143    True
1984   German_shepherd              0.596461    True
1985   Redbone                      0.506826    True


                        breed2  breed2_conf  breed2_dog  \
0      Bagel                        0.085851    False
1      Pekinese                     0.090647    True
2      Malamute                     0.078253    True
3      Labrador_retriever           0.168086    True
4      English_springer             0.225770    True
5      Irish_terrier                0.116317    True
6      Border_collie                0.199287    True
7      Eskimo_dog                   0.178406    True
8      Irish_setter                 0.193054    True
9      Cardigan                     0.451038    True
```

```
10     Pomeranian              0.013884    True
11     Labrador_retriever      0.151317    True
12     Cardigan                0.027356    True
13     Boxer                   0.002129    True
14     Labrador_retriever      0.013834    True
15     Borzoi                  0.194742    True
16     Tibetan_mastiff         0.120184    True
17     Labrador_retriever      0.184172    True
18     Eskimo_dog              0.166511    True
19     Pug                     0.000932    True
20     Redbone                 0.087582    True
22     Rhodesian_ridgeback     0.054950    True
23     Sea_lion                0.275645    False
24     Eskimo_dog              0.035029    True
25     Toy_terrier             0.143528    True
26     Great_pyrenees          0.186136    True
27     Sports_car              0.139952    False
28     Chihuahua               0.000361    True
29     Shower_cap              0.025286    False
30     Shih-tzu                0.006630    True
...      ...                      ...        ...
1797   Miniature_poodle        0.259920    True
1826   Lakeland_terrier        0.272621    True
1833   Italian_greyhound       0.270733    True
1839   Llama                   0.000043    False
1846   Pelican                 0.100554    False
1852   Shetland_sheepdog       0.054322    True
1856   Hamper                  0.363222    False
1869   Cowboy_boot             0.060343    False
1883   Siberian_husky          0.016168    True
1889   Pug                     0.093494    True
1896   Silky_terrier           0.300313    True
1905   Pug                     0.223427    True
1919   Chesapeake_bay_retriever 0.176293   True
1935   Chain_saw               0.190142    False
1942   Weimaraner              0.151363    True
1945   Chihuahua               0.029307    True
1957   Barracouta              0.271485    False
1958   Bloodhound              0.244220    True
1964   Newfoundland            0.278407    True
1965   Otter                   0.015250    False
1966   Toy_poodle              0.063064    True
1976   Tibetan_mastiff         0.093718    True
1977   Komondor                0.192305    True
1978   Shopping_basket         0.014594    False
1979   Tibetan_mastiff         0.058279    True
1980   Mud_turtle              0.045885    False
1981   English_springer        0.263788    True
```

```
1983  Redbone                   0.360687    True
1984  Malinois                  0.138584    True
1985  Miniature_pinscher        0.074192    True


                            breed3   breed3_conf  breed3_dog  dog_age  rating
0     Banana                        7.611000e-02  False       NaN      1.3
1     Papillon                      6.895690e-02  True        NaN      1.3
2     Kelpie                        3.137890e-02  True        NaN      1.2
3     Spatula                       4.083590e-02  False       NaN      1.3
4     German_short-haired_pointer   1.752190e-01  True        NaN      1.2
5     Indian_elephant               7.690220e-02  False       NaN      1.3
6     Ice_lolly                     1.935480e-01  False       NaN      1.3
7     Pembroke                      7.650690e-02  True        NaN      1.3
8     Chesapeake_bay_retriever      1.181840e-01  True        NaN      1.3
9     Chihuahua                     2.924820e-02  True        doggo    1.4
10    Chow                          8.167480e-03  True        NaN      1.3
11    Muzzle                        8.298110e-02  False       NaN      1.3
12    Basenji                       4.633230e-03  True        puppo    1.3
13    Staffordshire_bullterrier     1.498180e-03  True        NaN      1.2
14    Redbone                       7.957750e-03  True        puppo    1.3
15    Saluki                        2.735070e-02  True        NaN      1.3
16    Labrador_retriever            1.055060e-01  True        NaN      1.2
17    English_setter                7.348170e-02  True        NaN      1.3
18    Malamute                      1.114110e-01  True        NaN      1.3
19    Bull_mastiff                  9.032110e-04  True        NaN      1.2
20    Weimaraner                    2.623640e-02  True        NaN      1.3
22    Beagle                        3.891480e-02  True        NaN      1.3
23    Weimaraner                    1.342030e-01  True        NaN      1.3
24    Staffordshire_bullterrier     2.970470e-02  True        NaN      1.2
25    Can_opener                    3.225290e-02  False       NaN      1.3
26    Dandie_dinmont                8.634630e-02  True        NaN      1.3
27    Car_wheel                     4.417270e-02  False       NaN      1.3
28    Boston_bull                   7.556160e-05  True        pupper   1.2
29    Siamese_cat                   2.848920e-03  False       NaN      1.3
30    Bernese_mountain_dog          6.239150e-03  True        NaN      1.2
...                       ...               ...   ...         ...      ...
1797  Standard_poodle               8.252970e-02  True        NaN      1.0
1826  Soft-coated_wheaten_terrier   6.700630e-02  True        NaN      1.0
1833  Miniature_pinscher            1.097520e-01  True        NaN      0.7
1839  Ram                           2.160900e-07  False       NaN      1.0
1846  Crane                         8.471350e-02  False       NaN      0.7
1852  Whippet                       5.191340e-02  True        NaN      1.0
1856  Bassinet                      8.417350e-02  False       NaN      0.4
1869  Giant_panda                   5.983750e-02  False       NaN      0.7
1883  Eskimo_dog                    1.127740e-02  True        NaN      0.9
1889  Ice_bear                      6.903820e-02  False       NaN      0.8
1896  Australian_terrier            5.341200e-02  True        NaN      0.9
1905  Lakeland_terrier              7.331650e-02  True        NaN      1.1
```

```
         1919   Weimaraner                       1.123690e-01   True         NaN     0.8
         1935   Wig                              3.450970e-02   False        NaN     1.1
         1942   Vizsla                           8.598910e-02   True         NaN     1.0
         1945   French_bulldog                   2.075630e-02   True         NaN     0.8
         1957   Gar                              1.899450e-01   False        NaN     0.2
         1958   Flat-coated_retriever            1.738100e-01   True         NaN     0.7
         1964   Groenendael                      1.026430e-01   True         NaN     0.9
         1965   Great_grey_owl                   1.320720e-02   False        NaN     0.3
         1966   Miniature_poodle                 2.558060e-02   True         NaN     0.5
         1976   Labrador_retriever               7.242660e-02   True         NaN     1.0
         1977   Soft-coated_wheaten_terrier      8.208610e-02   True         NaN     0.8
         1978   Golden_retriever                 7.958960e-03   True         NaN     0.9
         1979   Fur_coat                         5.444860e-02   False        NaN     1.0
         1980   Terrapin                         1.788530e-02   False        NaN     0.2
         1981   Greater_swiss_mountain_dog       1.619920e-02   True         NaN     1.0
         1983   Miniature_pinscher               2.227520e-01   True         NaN     0.6
         1984   Bloodhound                       1.161970e-01   True         NaN     0.9
         1985   Rhodesian_ridgeback              7.201000e-02   True         NaN     0.7

         [1987 rows x 18 columns]
```

In [365]: # search for a sample name in both dataframes
          search_Jacob = see_lower[see_lower['name'] == 'Jacob']
          search_Jacob

Out[365]:   tweet_id   timestamp \
          1672   671743150407421952   2015-12-01 17:30:22 +0000

          1672   This is a Tuscaloosa Alcatraz named Jacob (Yacb). Loves to sit in swing. Stellar

                  name   retweet_count   favorite_count \
          1672   Jacob   228   726

                                                       jpg_url   breed1 \
          1672   https://pbs.twimg.com/media/CVKC1IfWIAAsQks.jpg Toy_poodle

                 breed1_conf   breed1_dog   breed2   breed2_conf   breed2_dog \
          1672   0.419427   True   Miniature_poodle   0.237067   True

                 breed3   breed3_conf   breed3_dog dog_age   rating
          1672   Swing   0.104193   False   NaN   1.1

In [366]: search_Jacob2 = df_clean7[df_clean7['name'] == 'Jacob']
          search_Jacob2

Out[366]:   tweet_id   timestamp \
          1672   671743150407421952   2015-12-01 17:30:22 +0000

```
         1672  This is a Tuscaloosa Alcatraz named Jacob (Yacb). Loves to sit in swing. Stellar

                name  retweet_count  favorite_count  \
         1672  Jacob  228                       726

                                                      jpg_url       breed1  \
         1672  https://pbs.twimg.com/media/CVKC1IfWIAAsQks.jpg  Toy_poodle

                breed1_conf  breed1_dog              breed2  breed2_conf  breed2_dog  \
         1672  0.419427        True      Miniature_poodle  0.237067        True

                breed3  breed3_conf  breed3_dog dog_age  rating
         1672  Swing   0.104193        False       NaN     1.1
```

In [367]: df_clean = df_clean7

Save to file

In [368]: df_clean.to_csv('twitter_archive_master.csv', index=False)

Data Analysis Report
I have done some random anaylsis, my findings are described in the act_report.

In [369]: from IPython.display import Image
          from IPython.core.display import HTML
          def path_to_image_html(path):
              return ''

In [370]: top_favorites = df_clean.nlargest(5, 'favorite_count')
          HTML(top_favorites.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))

Out[370]: <IPython.core.display.HTML object>

For the retriever in the pool, here is the full video: https://twitter.com/dog_rates/status/744234799360020481 and for the husky here: https://twitter.com/dog_rates/status/739238157791694849
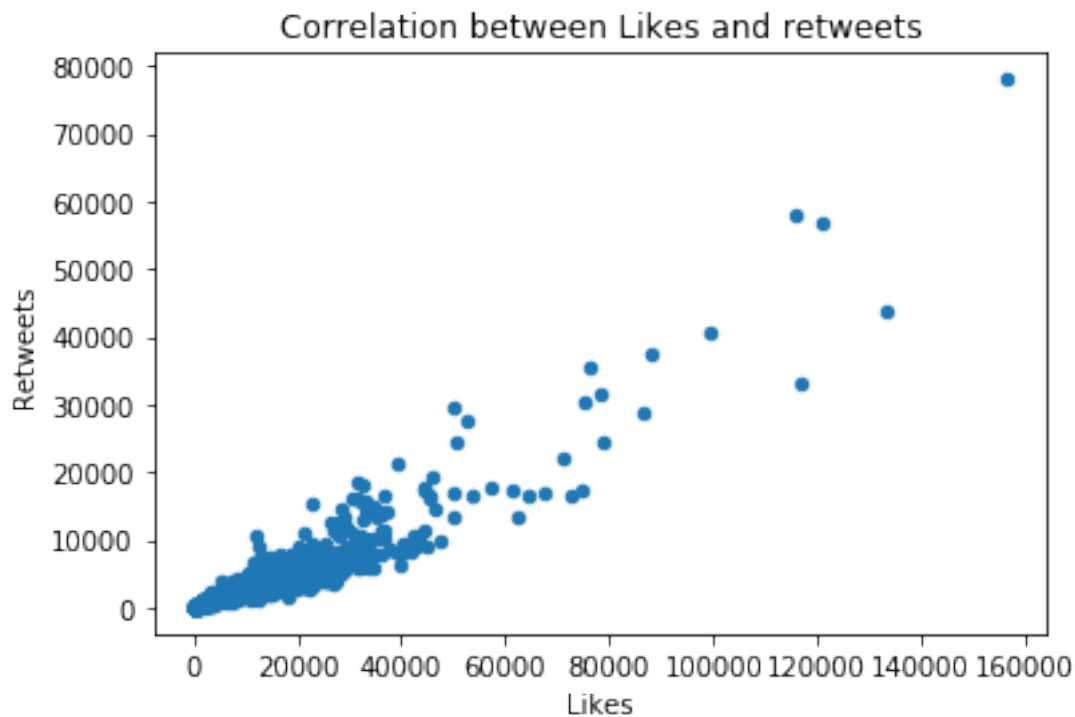
In [371]: top_retweets = df_clean.nlargest(5, 'retweet_count')
          HTML(top_retweets.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))

Out[371]: <IPython.core.display.HTML object>

Usually, there is high correlation between favorites and retweets, as it can be also seen in our top selection. Only Duddles from top retweets did not get to the top favorites (vid here:https://twitter.com/dog_rates/status/879415818425184262). For the correlation, here is the plot.

```
In [372]: fig = df_clean.plot(x='favorite_count', y='retweet_count', kind='scatter')
          fig.set_title('Correlation between Likes and retweets')
          fig.set_xlabel('Likes')
          fig.set_ylabel('Retweets')
          fig
```

Out[372]: `<matplotlib.axes._subplots.AxesSubplot at 0x7f084cb76ba8>`


```
In [373]: top_ratings = df_clean.nlargest(5, 'rating')
          HTML(top_ratings.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))
```

Out[373]: `<IPython.core.display.HTML object>`

Is it really a dog? And the next one?...

```
In [374]: Image(url= "https://pbs.twimg.com/media/CmgBZ7kWcAAlzFD.jpg")
```

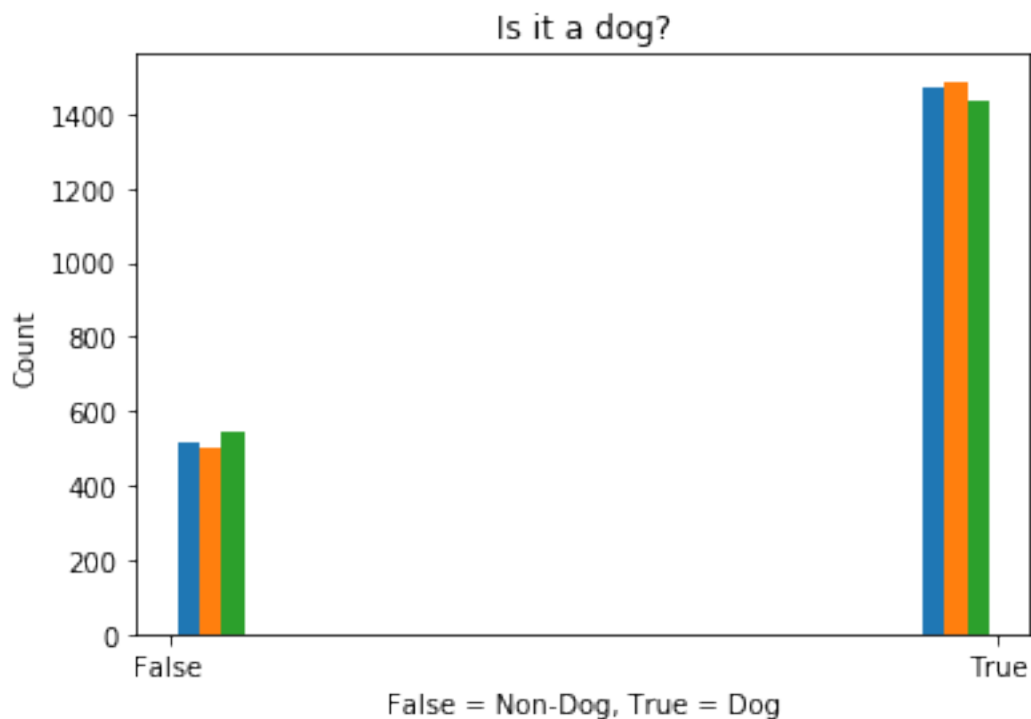Out[374]: `<IPython.core.display.Image object>`

```
In [375]: Image(url= "https://pbs.twimg.com/media/CU9P717W4AAOlKx.jpg")
```

Out[375]: `<IPython.core.display.Image object>`

Only one dog, the dog retriever, recognized in this top selection (not considering Snoop Dog), let's have a look at how accurately the AI recognized the dog photos.

```
In [376]: histogram = df_clean[['breed1_dog', 'breed2_dog', 'breed3_dog']]
          plt.hist(histogram)
          plt.ylabel('Count')
          plt.xlabel('False = Non-Dog, True = Dog')
          plt.title('Is it a dog?')

Out[376]: Text(0.5,1,'Is it a dog?')
```


Let's have look at which dogs the AI recognized the dogs best.

```
In [377]: dog_df = df_clean[df_clean['breed1_dog'] == True]
          nodog_df = df_clean[df_clean['breed1_dog'] == False]

In [378]: top_dogs = dog_df.groupby(by='breed1').mean()
          top_dogs.sort_values(by=['breed1_conf'], ascending=False).head()

Out[378]:                        tweet_id   retweet_count   favorite_count   breed1_conf  \
          breed1
          Komondor          7.774009e+17    1848.666667      9145.333333      0.972531
          Clumber           7.780270e+17    1643.000000      6655.000000      0.946718
          Brittany_spaniel  7.193514e+17    1323.285714      5393.714286      0.874545
          Keeshond          7.147067e+17    1513.750000      4471.750000      0.844431
          Bull_mastiff      7.541573e+17    1308.000000      5565.800000      0.815618

                            breed1_dog   breed2_conf   breed2_dog   breed3_conf  \
```

109

```
              breed1
              Komondor          1.0          0.024267      0.333333      0.001990
              Clumber           1.0          0.015950      1.000000      0.006519
              Brittany_spaniel  1.0          0.068643      1.000000      0.015733
              Keeshond          1.0          0.133600      1.000000      0.009140
              Bull_mastiff      1.0          0.079414      1.000000      0.031889

                                breed3_dog    rating
              breed1
              Komondor          0.333333      1.100000
              Clumber           1.000000      1.127000
              Brittany_spaniel  0.857143      1.042857
              Keeshond          1.000000      1.025000
              Bull_mastiff      1.000000      1.040000
```

In [379]: komondors = df_clean[df_clean['breed1'] == 'Komondor']
           HTML(komondors.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))

Out[379]: <IPython.core.display.HTML object>

In [380]: clumber = df_clean[df_clean['breed1'] == 'Clumber']
           HTML(clumber.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))

Out[380]: <IPython.core.display.HTML object>

In [381]: b_spaniel = df_clean[df_clean['breed1'] == 'Brittany_spaniel']
           HTML(b_spaniel.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))

Out[381]: <IPython.core.display.HTML object>

In [382]: top_dogs.sort_values(by=['rating'], ascending=False).head()

```
Out[382]:                       tweet_id     retweet_count   favorite_count   breed1_conf  \
          breed1
          Saluki             8.315403e+17   4522.250000     22246.250000     0.523054
          Briard             7.700369e+17   2613.333333     8694.666667      0.618748
          Tibetan_mastiff    7.534455e+17   3665.750000     11100.750000     0.679344
          Border_terrier     7.933788e+17   2994.285714     12489.714286     0.464345
          Standard_schnauzer 6.757109e+17   794.000000      1851.000000      0.441427

                             breed1_dog    breed2_conf   breed2_dog   breed3_conf  \
          breed1
          Saluki             1.0           0.208351      1.0          0.118570
          Briard             1.0           0.189322      1.0          0.053280
          Tibetan_mastiff    1.0           0.141119      1.0          0.058313
          Border_terrier     1.0           0.182590      1.0          0.079216
          Standard_schnauzer 1.0           0.248885      1.0          0.164967

                             breed3_dog    rating
```

```
           breed1
           Saluki              1.0             1.250000
           Briard              1.0             1.233333
           Tibetan_mastiff     1.0             1.225000
           Border_terrier      1.0             1.214286
           Standard_schnauzer  1.0             1.200000
```

In [383]: `top_dogs.sort_values(by=['favorite_count'], ascending=False).head()`

Out[383]:

```
                                  tweet_id   retweet_count  favorite_count  \
           breed1
           Saluki                8.315403e+17  4522.250000    22246.250
           French_bulldog        7.852970e+17  4294.800000    17520.720
           Afghan_hound          8.041621e+17  5231.333333    15809.000
           Black-and-tan_coonhound 7.602637e+17 3639.000000   15685.500
           Flat-coated_retriever 7.907257e+17  4040.375000    15507.375


                                  breed1_conf  breed1_dog  breed2_conf  breed2_dog  \
           breed1
           Saluki                0.523054     1.0         0.208351     1.00
           French_bulldog        0.777413     1.0         0.095869     0.88
           Afghan_hound          0.433959     1.0         0.099034     1.00
           Black-and-tan_coonhound 0.692000   1.0         0.147506     1.00
           Flat-coated_retriever 0.664417     1.0         0.134755     1.00


                                  breed3_conf  breed3_dog    rating
           breed1
           Saluki                0.118570     1.000000    1.250000
           French_bulldog        0.029870     0.800000    1.124000
           Afghan_hound          0.081651     0.666667    0.966667
           Black-and-tan_coonhound 0.097786   1.000000    1.050000
           Flat-coated_retriever 0.051912     1.000000    1.087500
```

In [384]: `salukis = df_clean[df_clean['breed1'] == 'Saluki']`
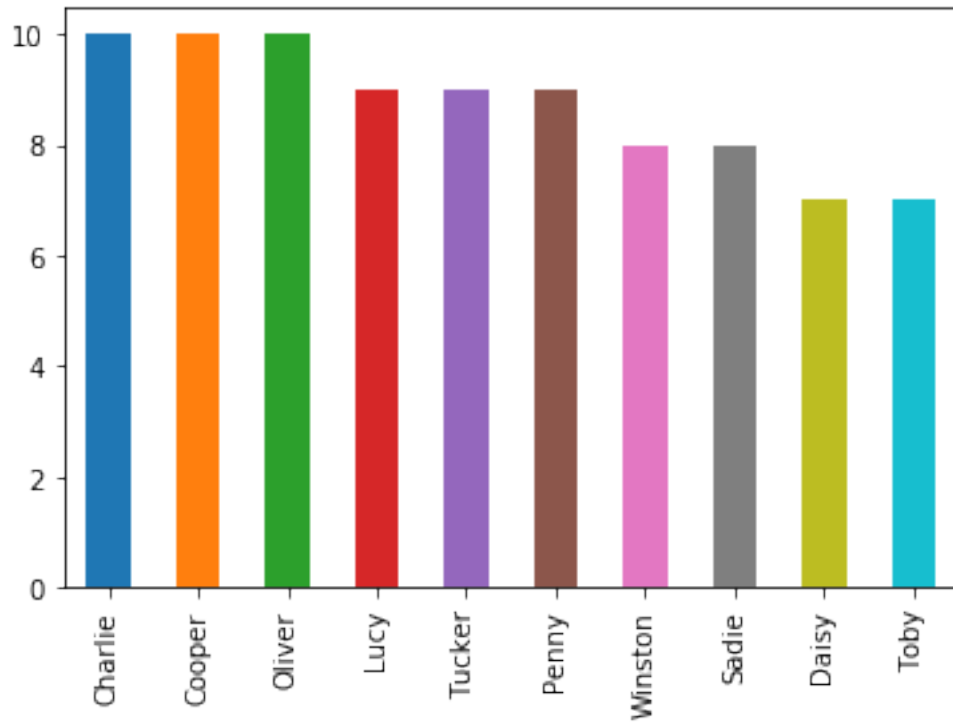   `HTML(salukis.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))`

Out[384]: `<IPython.core.display.HTML object>`

In [385]: `f_bulldog = df_clean[df_clean['breed1'] == 'French_bulldog']`
          `HTML(f_bulldog.to_html(escape=False ,formatters=dict(jpg_url=path_to_image_html)))`

Out[385]: `<IPython.core.display.HTML object>`

In [386]: `# plot popular names`
          `names = df_clean[df_clean['name'] != 'None']`
          `names_plot = names.name.value_counts()`
          `names_plot_r = names_plot.nlargest(10)`
          `names_plot_r.plot(kind='bar')`

Out[386]: `<matplotlib.axes._subplots.AxesSubplot at 0x7f084c9fa160>`

```
In [387]: names_plot.nsmallest(20)

Out[387]: Davey          1
          Raphael        1
          Sage           1
          Brandy         1
          Liam           1
          Karl           1
          Rontu          1
          Caryl          1
          Jaspers        1
          Jangle         1
          Dallas         1
          Al             1
          Anthony        1
          William        1
          Terrenth       1
          Huck           1
          Maya           1
          Brandonald     1
          Cedrick        1
          Franq          1
          Name: name, dtype: int64
```

```
In [ ]:
```