wrangle_act

January 9, 2019

0.1 We Rate Dogs Twitter Feed Analysis

0.1.1 1. Intro:

This project is all about gathering, assessing, cleaning, storing, analyzing and then visualizing the tweet history of the famous twitter account WeRatesDogs.

```python
In [1]: # At first, we start the project by installing all requested library.
        import pandas as pd
        import numpy as np
        import requests
        import tweepy
        import json
        import re
        import matplotlib.pyplot as plt
        import warnings
```

0.1.2 2. Gather Data

```python
In [2]: #Getting data from an existing file and store as a dataframe named twitter_archieve
        twitter_archive = pd.read_csv('twitter-archive-enhanced.csv')
```

```python
In [3]: #Using the Requests library to download a file from the internet, then write it down as
        url='https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predictions
        response = requests.get(url)

        with open('image_predictions.tsv', 'wb') as file:
            file.write(response.content)
```

```python
In [4]: # Read this newly created tsv file
        image_predictions = pd.read_csv('image_predictions.tsv', sep='\t')
```

```python
In [5]: image_predictions.head(10)
```

```
Out[5]:             tweet_id                                          jpg_url  \
        0  666020888022790149  https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg
        1  666029285002620928  https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
        2  666033412701032449  https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
        3  666044226329800704  https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
```

```
4  666049248165822465  https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
5  666050758794694657  https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
6  666051853826850816  https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
7  666055525042405380  https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
8  666057090499244032  https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg
9  666058600524156928  https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg

   img_num                    p1   p1_conf  p1_dog                 p2  \
0        1  Welsh_springer_spaniel  0.465074    True             collie
1        1                 redbone  0.506826    True  miniature_pinscher
2        1          German_shepherd  0.596461    True           malinois
3        1      Rhodesian_ridgeback  0.408143    True            redbone
4        1       miniature_pinscher  0.560311    True         Rottweiler
5        1     Bernese_mountain_dog  0.651137    True    English_springer
6        1               box_turtle  0.933012   False          mud_turtle
7        1                     chow  0.692517    True    Tibetan_mastiff
8        1            shopping_cart  0.962465   False     shopping_basket
9        1         miniature_poodle  0.201493    True           komondor

    p2_conf  p2_dog                          p3   p3_conf  p3_dog
0  0.156665    True          Shetland_sheepdog  0.061428    True
1  0.074192    True        Rhodesian_ridgeback  0.072010    True
2  0.138584    True                 bloodhound  0.116197    True
3  0.360687    True         miniature_pinscher  0.222752    True
4  0.243682    True                   Doberman  0.154629    True
5  0.263788    True  Greater_Swiss_Mountain_dog  0.016199    True
6  0.045885   False                    terrapin  0.017885   False
7  0.058279    True                    fur_coat  0.054449   False
8  0.014594   False           golden_retriever  0.007959    True
9  0.192305    True  soft-coated_wheaten_terrier  0.082086    True
```

```
In [7]:  # Variables created for tweepy query
         # 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)
```

```
In [8]:  # use For loop to add each tweet to a new line of a text file, write them all as a file
         with open('tweet_json.txt', 'a', encoding = 'utf8') as f:
             for tweet_id in twitter_archive['tweet_id']:
                 try:
                     tweet = api.get_status(tweet_id, tweet_mode='extended')
                     json.dump(tweet._json, f)
```

```
                  f.write('\n')
            except:
                continue

In [9]:  # use For loop to collect tweets into a list
         tweets_data = []
         tweet_file = open('tweet_json.txt', "r")

         for line in tweet_file:
             try:
                 tweet = json.loads(line)
                 tweets_data.append(tweet)
             except:
                 continue

         tweet_file.close()

In [10]:  # create tweet_info DataFrame
          tweet_info = pd.DataFrame()

In [11]:  # Add some variables to tweet_info DataFrame
          tweet_info['id'] = list(map(lambda tweet: tweet['id'], tweets_data))
          tweet_info['retweet_count'] = list(map(lambda tweet: tweet['retweet_count'], tweets_dat
          tweet_info['farvorite_count'] = list(map(lambda tweet: tweet['favorite_count'], tweets_
```

0.1.3 3. Access

We are going to access the twitter_archive, image_predictions and tweet_info DataFrame in term
of their head(), tail(), info() and descriptive statistic categories. From that we will see a big picture
of what these data set are like, what are they lacking and incorrect.

```
In [12]:  # first 15 rows of twitter_archive DataFrame
          twitter_archive.head(15)

Out[12]:             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  889665388333682689                    NaN                  NaN
         13  889638837579907072                    NaN                  NaN
```

```
14  889531135344209921                            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


                                                source  \
0    <a href="http://twitter.com/download/iphone" r...
1    <a href="http://twitter.com/download/iphone" r...
2    <a href="http://twitter.com/download/iphone" r...
3    <a href="http://twitter.com/download/iphone" r...
4    <a href="http://twitter.com/download/iphone" r...
5    <a href="http://twitter.com/download/iphone" r...
6    <a href="http://twitter.com/download/iphone" r...
7    <a href="http://twitter.com/download/iphone" r...
8    <a href="http://twitter.com/download/iphone" r...
9    <a href="http://twitter.com/download/iphone" r...
10   <a href="http://twitter.com/download/iphone" r...
11   <a href="http://twitter.com/download/iphone" r...
12   <a href="http://twitter.com/download/iphone" r...
13   <a href="http://twitter.com/download/iphone" r...
14   <a href="http://twitter.com/download/iphone" r...


                                                text  retweeted_status_id  \
0    This is Phineas. He's a mystical boy. Only eve...                  NaN
1    This is Tilly. She's just checking pup on you...                   NaN
2    This is Archie. He is a rare Norwegian Pouncin...                  NaN
3    This is Darla. She commenced a snooze mid meal...                  NaN
4    This is Franklin. He would like you to stop ca...                  NaN
5    Here we have a majestic great white breaching ...                  NaN
6    Meet Jax. He enjoys ice cream so much he gets ...                  NaN
7    When you watch your owner call another dog a g...                  NaN
8    This is Zoey. She doesn't want to be one of th...                  NaN
9    This is Cassie. She is a college pup. Studying...                  NaN
10   This is Koda. He is a South Australian decksha...                  NaN
```

```
11  This is Bruno. He is a service shark. Only get...            NaN
12  Here's a puppo that seems to be on the fence a...           NaN
13  This is Ted. He does his best. Sometimes that'...           NaN
14  This is Stuart. He's sporting his favorite fan...           NaN


    retweeted_status_user_id retweeted_status_timestamp  \
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


                                    expanded_urls  rating_numerator  \
0   https://twitter.com/dog_rates/status/892420643...                13
1   https://twitter.com/dog_rates/status/892177421...                13
2   https://twitter.com/dog_rates/status/891815181...                12
3   https://twitter.com/dog_rates/status/891689557...                13
4   https://twitter.com/dog_rates/status/891327558...                12
5   https://twitter.com/dog_rates/status/891087950...                13
6   https://gofundme.com/ydvmve-surgery-for-jax,ht...                13
7   https://twitter.com/dog_rates/status/890729181...                13
8   https://twitter.com/dog_rates/status/890609185...                13
9   https://twitter.com/dog_rates/status/890240255...                14
10  https://twitter.com/dog_rates/status/890006608...                13
11  https://twitter.com/dog_rates/status/889880896...                13
12  https://twitter.com/dog_rates/status/889665388...                13
13  https://twitter.com/dog_rates/status/889638837...                12
14  https://twitter.com/dog_rates/status/889531135...                13


    rating_denominator      name doggo floofer pupper  puppo
0                   10   Phineas  None    None   None   None
1                   10     Tilly  None    None   None   None
2                   10    Archie  None    None   None   None
3                   10     Darla  None    None   None   None
4                   10  Franklin  None    None   None   None
5                   10      None  None    None   None   None
6                   10       Jax  None    None   None   None
7                   10      None  None    None   None   None
```

```
8           10      Zoey    None    None    None    None
9           10    Cassie   doggo    None    None    None
10          10      Koda    None    None    None    None
11          10     Bruno    None    None    None    None
12          10      None    None    None    None   puppo
13          10       Ted    None    None    None    None
14          10    Stuart    None    None    None   puppo
```

In [13]: *# last 15 rows of twitter_archive DataFrame*
         twitter_archive.tail(15)

Out[13]:   tweet_id in_reply_to_status_id in_reply_to_user_id \
         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 \
         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

                                              source \
         2341 <a href="http://twitter.com/download/iphone" r...
         2342 <a href="http://twitter.com/download/iphone" r...
```

```
2343    <a href="http://twitter.com/download/iphone" r...
2344    <a href="http://twitter.com/download/iphone" r...
2345    <a href="http://twitter.com/download/iphone" r...
2346    <a href="http://twitter.com/download/iphone" r...
2347    <a href="http://twitter.com/download/iphone" r...
2348    <a href="http://twitter.com/download/iphone" r...
2349    <a href="http://twitter.com/download/iphone" r...
2350    <a href="http://twitter.com/download/iphone" r...
2351    <a href="http://twitter.com/download/iphone" r...
2352    <a href="http://twitter.com/download/iphone" r...
2353    <a href="http://twitter.com/download/iphone" r...
2354    <a href="http://twitter.com/download/iphone" r...
2355    <a href="http://twitter.com/download/iphone" r...

                                                   text  retweeted_status_id  \
2341  This appears to be a Mongolian Presbyterian mi...                  NaN
2342  Here we have a well-established sunblockerspan...                  NaN
2343  Let's hope this flight isn't Malaysian (lol). ...                  NaN
2344  Here we have a northern speckled Rhododendron...                   NaN
2345  This is the happiest dog you will ever see. Ve...                  NaN
2346  Here is the Rand Paul of retrievers folks! He'...                  NaN
2347  My oh my. This is a rare blond Canadian terrie...                  NaN
2348  Here is a Siberian heavily armored polar bear ...                  NaN
2349  This is an odd dog. Hard on the outside but lo...                  NaN
2350  This is a truly beautiful English Wilson Staff...                  NaN
2351  Here we have a 1949 1st generation vulpix. Enj...                  NaN
2352  This is a purebred Piers Morgan. Loves to Netf...                  NaN
2353  Here is a very happy pup. Big fan of well-main...                  NaN
2354  This is a western brown Mitsubishi terrier. Up...                  NaN
2355  Here we have a Japanese Irish Setter. Lost eye...                  NaN

      retweeted_status_user_id retweeted_status_timestamp  \
2341                       NaN                        NaN
2342                       NaN                        NaN
2343                       NaN                        NaN
2344                       NaN                        NaN
2345                       NaN                        NaN
2346                       NaN                        NaN
2347                       NaN                        NaN
2348                       NaN                        NaN
2349                       NaN                        NaN
2350                       NaN                        NaN
2351                       NaN                        NaN
2352                       NaN                        NaN
2353                       NaN                        NaN
2354                       NaN                        NaN
2355                       NaN                        NaN
```

```
                                             expanded_urls  rating_numerator  \
2341   https://twitter.com/dog_rates/status/666094000...                 9
2342   https://twitter.com/dog_rates/status/666082916...                 6
2343   https://twitter.com/dog_rates/status/666073100...                10
2344   https://twitter.com/dog_rates/status/666071193...                 9
2345   https://twitter.com/dog_rates/status/666063827...                10
2346   https://twitter.com/dog_rates/status/666058600...                 8
2347   https://twitter.com/dog_rates/status/666057090...                 9
2348   https://twitter.com/dog_rates/status/666055525...                10
2349   https://twitter.com/dog_rates/status/666051853...                 2
2350   https://twitter.com/dog_rates/status/666050758...                10
2351   https://twitter.com/dog_rates/status/666049248...                 5
2352   https://twitter.com/dog_rates/status/666044226...                 6
2353   https://twitter.com/dog_rates/status/666033412...                 9
2354   https://twitter.com/dog_rates/status/666029285...                 7
2355   https://twitter.com/dog_rates/status/666020888...                 8


       rating_denominator  name doggo floofer pupper puppo
2341                   10  None  None    None   None  None
2342                   10  None  None    None   None  None
2343                   10  None  None    None   None  None
2344                   10  None  None    None   None  None
2345                   10   the  None    None   None  None
2346                   10   the  None    None   None  None
2347                   10     a  None    None   None  None
2348                   10     a  None    None   None  None
2349                   10    an  None    None   None  None
2350                   10     a  None    None   None  None
2351                   10  None  None    None   None  None
2352                   10     a  None    None   None  None
2353                   10     a  None    None   None  None
2354                   10     a  None    None   None  None
2355                   10  None  None    None   None  None

In [14]: 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 [15]: twitter_archive.describe()

Out[15]:

	tweet_id	in_reply_to_status_id	in_reply_to_user_id \
count	2.356000e+03	7.800000e+01	7.800000e+01
mean	7.427716e+17	7.455079e+17	2.014171e+16
std	6.856705e+16	7.582492e+16	1.252797e+17
min	6.660209e+17	6.658147e+17	1.185634e+07
25%	6.783989e+17	6.757419e+17	3.086374e+08
50%	7.196279e+17	7.038708e+17	4.196984e+09
75%	7.993373e+17	8.257804e+17	4.196984e+09
max	8.924206e+17	8.862664e+17	8.405479e+17

	retweeted_status_id	retweeted_status_user_id	rating_numerator \
count	1.810000e+02	1.810000e+02	2356.000000
mean	7.720400e+17	1.241698e+16	13.126486
std	6.236928e+16	9.599254e+16	45.876648
min	6.661041e+17	7.832140e+05	0.000000
25%	7.186315e+17	4.196984e+09	10.000000
50%	7.804657e+17	4.196984e+09	11.000000
75%	8.203146e+17	4.196984e+09	12.000000
max	8.874740e+17	7.874618e+17	1776.000000

	rating_denominator
count	2356.000000
mean	10.455433
std	6.745237
min	0.000000
25%	10.000000
50%	10.000000
75%	10.000000
max	170.000000

In [16]: # first 15 rows of image_predictions DataFrame
        image_predictions.head(15)

Out[16]:

	tweet_id	jpg_url \
0	666020888022790149	https://pbs.twimg.com/media/CT4udnOWwAAOaMy.jpg

```
1    666029285002620928    https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
2    666033412701032449    https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
3    666044226329800704    https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
4    666049248165822465    https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
5    666050758794694657    https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg
6    666051853826850816    https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg
7    666055525042405380    https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg
8    666057090499244032    https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg
9    666058600524156928    https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
10   666063827256086533    https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
11   666071193221509120    https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg
12   666073100786774016    https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
13   666082916733198337    https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
14   666094000022159362    https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
```

```
     img_num                  p1    p1_conf  p1_dog                 p2  \
0          1  Welsh_springer_spaniel  0.465074    True            collie
1          1                 redbone  0.506826    True  miniature_pinscher
2          1         German_shepherd  0.596461    True           malinois
3          1      Rhodesian_ridgeback  0.408143    True            redbone
4          1      miniature_pinscher  0.560311    True         Rottweiler
5          1     Bernese_mountain_dog  0.651137    True    English_springer
6          1              box_turtle  0.933012   False          mud_turtle
7          1                    chow  0.692517    True     Tibetan_mastiff
8          1           shopping_cart  0.962465   False    shopping_basket
9          1         miniature_poodle  0.201493    True           komondor
10         1         golden_retriever  0.775930    True     Tibetan_mastiff
11         1            Gordon_setter  0.503672    True   Yorkshire_terrier
12         1             Walker_hound  0.260857    True    English_foxhound
13         1                     pug  0.489814    True        bull_mastiff
14         1              bloodhound  0.195217    True     German_shepherd
```

```
      p2_conf  p2_dog                         p3   p3_conf  p3_dog
0    0.156665    True          Shetland_sheepdog  0.061428    True
1    0.074192    True        Rhodesian_ridgeback  0.072010    True
2    0.138584    True                 bloodhound  0.116197    True
3    0.360687    True         miniature_pinscher  0.222752    True
4    0.243682    True                   Doberman  0.154629    True
5    0.263788    True  Greater_Swiss_Mountain_dog  0.016199    True
6    0.045885   False                    terrapin  0.017885   False
7    0.058279    True                    fur_coat  0.054449   False
8    0.014594   False            golden_retriever  0.007959    True
9    0.192305    True  soft-coated_wheaten_terrier  0.082086    True
10   0.093718    True           Labrador_retriever  0.072427    True
11   0.174201    True                    Pekinese  0.109454    True
12   0.175382    True                 Ibizan_hound  0.097471    True
13   0.404722    True              French_bulldog  0.048960    True
14   0.078260    True                     malinois  0.075628    True
```

```
In [17]:  # last 15 rows of image_predictions DataFrame
          image_predictions.tail(15)

Out[17]:              tweet_id                                     jpg_url  \
          2060  889531135344209921  https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg
          2061  889638837579907072  https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg
          2062  889665388333682689  https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg
          2063  889880896479866881  https://pbs.twimg.com/media/DFl99B1WsAITKsg.jpg
          2064  890006608113172480  https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
          2065  890240255349198849  https://pbs.twimg.com/media/DFrEyVuW0AAO3t9.jpg
          2066  890609185150312448  https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
          2067  890729181411237888  https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
          2068  890971913173991426  https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
          2069  891087950875897856  https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
          2070  891327558926688256  https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
          2071  891689557279858688  https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
          2072  891815181378084864  https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
          2073  892177421306343426  https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
          2074  892420643555336193  https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg

                img_num                       p1    p1_conf  p1_dog                 p2  \
          2060        1         golden_retriever   0.953442    True  Labrador_retriever
          2061        1            French_bulldog   0.991650    True               boxer
          2062        1                 Pembroke   0.966327    True            Cardigan
          2063        1            French_bulldog   0.377417    True  Labrador_retriever
          2064        1                  Samoyed   0.957979    True          Pomeranian
          2065        1                 Pembroke   0.511319    True            Cardigan
          2066        1             Irish_terrier   0.487574    True        Irish_setter
          2067        2               Pomeranian   0.566142    True          Eskimo_dog
          2068        1               Appenzeller   0.341703    True       Border_collie
          2069        1  Chesapeake_Bay_retriever   0.425595    True       Irish_terrier
          2070        2                   basset   0.555712    True     English_springer
          2071        1              paper_towel   0.170278   False  Labrador_retriever
          2072        1                Chihuahua   0.716012    True            malamute
          2073        1                Chihuahua   0.323581    True            Pekinese
          2074        1                   orange   0.097049   False               bagel

                p2_conf  p2_dog                         p3    p3_conf  p3_dog
          2060  0.013834    True                    redbone   0.007958    True
          2061  0.002129    True  Staffordshire_bullterrier   0.001498    True
          2062  0.027356    True                    basenji   0.004633    True
          2063  0.151317    True                     muzzle   0.082981   False
          2064  0.013884    True                        chow   0.008167    True
          2065  0.451038    True                  Chihuahua   0.029248    True
          2066  0.193054    True   Chesapeake_Bay_retriever   0.118184    True
          2067  0.178406    True                   Pembroke   0.076507    True
          2068  0.199287    True                   ice_lolly   0.193548   False
          2069  0.116317    True            Indian_elephant   0.076902   False
```

```
2070  0.225770     True  German_short-haired_pointer  0.175219     True
2071  0.168086     True                      spatula  0.040836    False
2072  0.078253     True                       kelpie  0.031379     True
2073  0.090647     True                     papillon  0.068957     True
2074  0.085851    False                       banana  0.076110    False
```

In [18]: 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 [19]: image_predictions.describe()

```
Out[19]:            tweet_id       img_num       p1_conf       p2_conf       p3_conf
        count  2.075000e+03   2075.000000   2075.000000  2.075000e+03  2.075000e+03
        mean   7.384514e+17      1.203855      0.594548  1.345886e-01  6.032417e-02
        std    6.785203e+16      0.561875      0.271174  1.006657e-01  5.090593e-02
        min    6.660209e+17      1.000000      0.044333  1.011300e-08  1.740170e-10
        25%    6.764835e+17      1.000000      0.364412  5.388625e-02  1.622240e-02
        50%    7.119988e+17      1.000000      0.588230  1.181810e-01  4.944380e-02
        75%    7.932034e+17      1.000000      0.843855  1.955655e-01  9.180755e-02
        max    8.924206e+17      4.000000      1.000000  4.880140e-01  2.734190e-01
```

In [20]: # Rename the id columns to "tweet_id" in order to match with another Dataframe, then vi
        tweet_info.rename(index=str, columns={"id":"tweet_id"}, inplace=True)
        tweet_info.head(5)

```
Out[20]:            tweet_id  retweet_count  farvorite_count
        0  892420643555336193           8328            38075
        1  892177421306343426           6151            32683
        2  891815181378084864           4072            24595
        3  891689557279858688           8472            41435
        4  891327558926688256           9166            39610
```

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```
In [21]: tweet_info.describe()

Out[21]:              tweet_id   retweet_count   farvorite_count
         count   1.783000e+03    1783.000000       1783.000000
         mean    7.644104e+17    3596.747056       9872.496915
         std     6.367276e+16    5366.963916      13331.072948
         min     6.772289e+17       0.000000          0.000000
         25%     7.039145e+17    1000.000000       2594.000000
         50%     7.580996e+17    1994.000000       5111.000000
         75%     8.182835e+17    4140.000000      12548.000000
         max     8.924206e+17   83770.000000     164485.000000
```

0.2   4. Issue Gathered

0.2.1   Quality Issue:

* **twitter_archive dataset**   Issue #1: Inappropriate columns type.   There are some including:tweet_id, source, timestamp... columns should be corrected to its type.

Issue #2: 'text' columns doesn't show full content.

Issue #3: 'name' columns have many cells which are None, missing or incorrect value.

Issue #4: The only data we want should have original (no retweets) ratings and have images as well.

Issue #5: In the 'text' column, there are a few extra characters after '&'

Issue #6: Some collumns should be renamed to be more details and easy to read. For example: timestamp, source, text...

Issue #7: The 'source' column is diffcult to read as It contains
tags and links

* **image_predictions and tweet_info dataset**   Issue #8: Duplicated tweet_id cell noticed.

0.2.2   Tidiness

Issue #9: We can demostrate Dog "stage" information by collecting from four columns: doggo, floofer, pupper, puppo.

Issue #10: We can join image_predictions and tweet_info to twitter_archive table for easy read and collecting information.

0.3   5. Clean

In this step, we will start fixing our Quality and Tidiness issues which is stated in the last step

```
In [22]: # By joining all DataFrame at one, it is easier to us to manage and solve all of the is
         df_all = pd.merge(twitter_archive, image_predictions, how = 'left', on=['tweet_id'])
         df_all = pd.merge(df_all, tweet_info, how ='left', on=['tweet_id'])
         df_all.to_csv('df_all.csv', encoding='utf-8')
         df_all.info()
         #This will solve Issue #10 stated above
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2356 entries, 0 to 2355
Data columns (total 30 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
jpg_url                      2075 non-null object
img_num                      2075 non-null float64
p1                           2075 non-null object
p1_conf                      2075 non-null float64
p1_dog                       2075 non-null object
p2                           2075 non-null object
p2_conf                      2075 non-null float64
p2_dog                       2075 non-null object
p3                           2075 non-null object
p3_conf                      2075 non-null float64
p3_dog                       2075 non-null object
retweet_count                1783 non-null float64
farvorite_count              1783 non-null float64
dtypes: float64(10), int64(3), object(17)
memory usage: 570.6+ KB
```

```python
In [23]: #By following order, we delete the retweets, duplicated tweet_id and tweets with no ima
         df_all = df_all[pd.isnull(df_all.retweeted_status_id)]
         df_all = df_all.drop_duplicates()
         df_all = df_all.dropna(subset=['jpg_url'])
         #This will solve Issue #8 stated above

In [24]: # Now remove abundance columns we don't need any more
         df_all = df_all.drop(columns=['in_reply_to_status_id', 'in_reply_to_user_id','retweeted

In [25]: # Issue #4 is solved
         list(df_all)
```

```
Out[25]: ['tweet_id',
          'timestamp',
          'source',
          'text',
          'expanded_urls',
          'rating_numerator',
          'rating_denominator',
          'name',
          'doggo',
          'floofer',
          'pupper',
          'puppo',
          'jpg_url',
          'img_num',
          'p1',
          'p1_conf',
          'p1_dog',
          'p2',
          'p2_conf',
          'p2_dog',
          'p3',
          'p3_conf',
          'p3_dog',
          'retweet_count',
          'farvorite_count']

In [26]: # Blend 4 different dog stages ('doggo', 'floofer', 'pupper', 'puppo') into one column
         df_all['dog_stage'] = df_all['text'].str.extract('(puppo|pupper|floofer|doggo)', expand
         selected_columns = ['doggo', 'floofer', 'pupper', 'puppo']
         df_all.drop(selected_columns, axis = 1, inplace = True)
         #Solved Issue #9

In [27]: # Display full content of 'text' column.
         # Set column width to infinite so entire content of 'text' column is displayed
         pd.set_option('display.max_colwidth', -1)
         df_all.sample(5)
         #Issue #2 is solved

Out[27]:                 tweet_id                       timestamp  \
         2267   667524857454854144   2015-11-20 02:08:22 +0000
         1927   674051556661161984   2015-12-08 02:23:09 +0000
         1974   673148804208660480   2015-12-05 14:35:56 +0000
         85     876120275196170240   2017-06-17 16:52:05 +0000
         1077   739544079319588864   2016-06-05 19:47:03 +0000


                                                                          sourc
         2267   <a href="http://twitter.com" rel="nofollow">Twitter Web Client</a>
         1927   <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
```

```
1974  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
85    <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
1077  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a


2267  Another topnotch dog. His name is Big Jumpy Rat. Massive ass feet. Superior tail.
1927  This is Lucy. She knits. Specializes in toboggans. 10/10 I'd buy a toboggan from
1974  This is Fletcher. He's had a ruff night. No more Fireball for Fletcher. 8/10 it'l
85    Meet Venti, a seemingly caffeinated puppoccino. She was just informed the weekend
1077  This... is a Tyrannosaurus rex. We only rate dogs. Please only send in dogs. Than

                                                      expanded_urls  \
2267  https://twitter.com/dog_rates/status/667524857454854144/photo/1
1927  https://twitter.com/dog_rates/status/674051556661161984/photo/1
1974  https://twitter.com/dog_rates/status/673148804208660480/photo/1
85    https://twitter.com/dog_rates/status/876120275196170240/photo/1
1077  https://twitter.com/dog_rates/status/739544079319588864/photo/1


      rating_numerator  rating_denominator      name  \
2267  12                10                      None
1927  10                10                      Lucy
1974  8                 10                      Fletcher
85    13                10                      Venti
1077  10                10                      None


                                              jpg_url  img_num    ...        \
2267  https://pbs.twimg.com/media/CUOGUfJW4AA_eni.jpg  1.0        ...
1927  https://pbs.twimg.com/media/CVq2UHwWEAAduMw.jpg  1.0        ...
1974  https://pbs.twimg.com/media/CVeBQwiUsAAqhLw.jpg  1.0        ...
85    https://pbs.twimg.com/media/DCiavj_UwAAcXep.jpg  1.0        ...
1077  https://pbs.twimg.com/media/CkNjahBXAAQ2kWo.jpg  1.0        ...


      p1_dog                p2    p2_conf p2_dog                         p3  \
2267  False   dhole           0.092435  False   Chesapeake_Bay_retriever
1927  True    badger          0.160580  False   three-toed_sloth
1974  False   bathtub         0.091434  False   toilet_seat
85    True    Saint_Bernard   0.346312  True    Greater_Swiss_Mountain_dog
1077  True    golden_retriever 0.016641 True    ice_bear


      p3_conf  p3_dog  retweet_count farvorite_count  dog_stage
2267  0.088122  True   NaN           NaN              NaN
1927  0.132154  False  NaN           NaN              NaN
1974  0.025456  False  NaN           NaN              pupper
85    0.094933  True   4620.0        27498.0          puppo
1077  0.014858  False  22859.0       41599.0          NaN


[5 rows x 22 columns]
```

```
In [28]:  #After researching the 'text' column, I noticed the pattern:
          # This is [name] ..
          # Meet [name] ..
          # Say hello to [name] ..
          # Here we have [name] ..
          # .. named [name] ..
          #By looping through all the text, we can easily extract the dog's name from the tweet

          dog_names = []

          for text in df_all['text']:
              # Sentences starts with 'This is ' and the fisrt letter of the name is uppercase
              if text.startswith('This is ') and re.match(r'[A-Z].*', text.split()[2]):
                  dog_names.append(text.split()[2].strip(',').strip('.'))
              # Sentences start with 'Meet ' and the fisrt letter of the name is uppercase
              elif text.startswith('Meet ') and re.match(r'[A-Z].*', text.split()[1]):
                  dog_names.append(text.split()[1].strip(',').strip('.'))
              # Sentences start with 'Say hello to ' and the fisrt letter of the name is uppercas
              elif text.startswith('Say hello to ') and re.match(r'[A-Z].*', text.split()[3]):
                  dog_names.append(text.split()[3].strip(',').strip('.'))
              # Sentences start with 'Here we have ' and the fisrt letter of the name is uppercas
              elif text.startswith('Here we have ') and re.match(r'[A-Z].*', text.split()[3]):
                  dog_names.append(text.split()[3].strip(',').strip('.'))
              # Sentences contain 'named' and the fisrt letter of the name is uppercase
              elif 'named' in text and re.match(r'[A-Z].*', text.split()[text.split().index('name
                  dog_names.append(text.split()[text.split().index('named') + 1].strip(',').strip
              # Otherwise..
              else:
                  dog_names.append('NaN')

          # Save the result in a column 'dog_name' and append to the table
          df_all['dog_names'] = dog_names

In [29]:  df_all['dog_names']

Out[29]:  0          Phineas
          1          Tilly
          2          Archie
          3          Darla
          4          Franklin
          5          NaN
          6          Jax
          7          NaN
          8          Zoey
          9          Cassie
          10         Koda
          11         Bruno
          12         NaN
```

```
13      Ted
14      Stuart
15      Oliver
16      Jim
17      Zeke
18      Ralphus
20      Gerald
21      Jeffrey
22      NaN
23      Canela
24      NaN
25      NaN
26      Maya
27      Mingus
28      Derek
29      Roscoe
31      Waffles
        ...
2326    NaN
2327    NaN
2328    NaN
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
```

```
          Name: dog_names, Length: 1994, dtype: object

In [30]: #Now we can delete the 'name' column as we dont need it any more
         df_all= df_all.drop(columns = 'name', axis =1)
         #This will solve Issue #3 stated above

In [31]: df_all

Out[31]:                   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
         20    888078434458587136  2017-07-20 16:49:33 +0000
         21    887705289381826560  2017-07-19 16:06:48 +0000
         22    887517139158093824  2017-07-19 03:39:09 +0000
         23    887473957103951883  2017-07-19 00:47:34 +0000
         24    887343217045368832  2017-07-18 16:08:03 +0000
         25    887101392804085760  2017-07-18 00:07:08 +0000
         26    886983233522544640  2017-07-17 16:17:36 +0000
         27    886736880519319552  2017-07-16 23:58:41 +0000
         28    886680336477933568  2017-07-16 20:14:00 +0000
         29    886366144734445568  2017-07-15 23:25:31 +0000
         31    886258384151887873  2017-07-15 16:17:19 +0000
         ...                  ...                            ...
         2326  666411507551481857  2015-11-17 00:24:19 +0000
         2327  666407126856765440  2015-11-17 00:06:54 +0000
         2328  666396247373291520  2015-11-16 23:23:41 +0000
         2329  666373753744588802  2015-11-16 21:54:18 +0000
         2330  666362758909284353  2015-11-16 21:10:36 +0000
         2331  666353288456101888  2015-11-16 20:32:58 +0000
         2332  666345417576210432  2015-11-16 20:01:42 +0000
         2333  666337882303524864  2015-11-16 19:31:45 +0000
```

```
2334   666293911632134144   2015-11-16 16:37:02 +0000
2335   666287406224695296   2015-11-16 16:11:11 +0000
2336   666273097616637952   2015-11-16 15:14:19 +0000
2337   666268910803644416   2015-11-16 14:57:41 +0000
2338   666104133288665088   2015-11-16 04:02:55 +0000
2339   666102155909144576   2015-11-16 03:55:04 +0000
2340   666099513787052032   2015-11-16 03:44:34 +0000
2341   666094000022159362   2015-11-16 03:22:39 +0000
2342   666082916733198337   2015-11-16 02:38:37 +0000
2343   666073100786774016   2015-11-16 01:59:36 +0000
2344   666071193221509120   2015-11-16 01:52:02 +0000
2345   666063827256086533   2015-11-16 01:22:45 +0000
2346   666058600524156928   2015-11-16 01:01:59 +0000
2347   666057090499244032   2015-11-16 00:55:59 +0000
2348   666055525042405380   2015-11-16 00:49:46 +0000
2349   666051853826850816   2015-11-16 00:35:11 +0000
2350   666050758794694657   2015-11-16 00:30:50 +0000
2351   666049248165822465   2015-11-16 00:24:50 +0000
2352   666044226329800704   2015-11-16 00:04:52 +0000
2353   666033412701032449   2015-11-15 23:21:54 +0000
2354   666029285002620928   2015-11-15 23:05:30 +0000
2355   666020888022790149   2015-11-15 22:32:08 +0000


                                                                              sourc
0      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
1      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
2      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
3      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
4      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
5      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
6      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
7      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
8      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
9      <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
10     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
11     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for iPhone</a
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0     This is Phineas. He's a mystical boy. Only ever appears in the hole of a donut. 1
1     This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not, she
2     This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall grass. Y
3     This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of us h
4     This is Franklin. He would like you to stop calling him "cute." He is a very fier
5     Here we have a majestic great white breaching off South Africa's coast. Absolutel
6     Meet Jax. He enjoys ice cream so much he gets nervous around it. 13/10 help Jax e
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
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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. Frightening
11    This is Bruno. He is a service shark. Only gets out of the water to assist you. 1
12    Here's a puppo that seems to be on the fence about something haha no but seriousl
13    This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10 wo
14    This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bones
15    This is Oliver. You're witnessing one of his many brutal attacks. Seems to be pla
16    This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 for
17    This is Zeke. He has a new stick. Very proud of it. Would like you to throw it fo
18    This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspiratio
20    This is Gerald. He was just told he didn't get the job he interviewed for. A h*ck
21    This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'boop
22    I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-insp
23    This is Canela. She attempted some fancy porch pics. They were unsuccessful. 13/1
24    You may not have known you needed to see this today. 13/10 please enjoy (IG: emmy
25    This... is a Jubilant Antarctic House Bear. We only rate dogs. Please only send d
26    This is Maya. She's very shy. Rarely leaves her cup. 13/10 would find her an envi
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://t
29    This is Roscoe. Another pupper fallen victim to spontaneous tongue ejections. Get
31    This is Waffles. His doggles are pupside down. Unsure how to fix. 13/10 someone a
...
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 wi
2328  Oh goodness. A super rare northeast Qdoba kangaroo mix. Massive feet. No pouch (d
2329  Those are sunglasses and a jean jacket. 11/10 dog cool af https://t.co/uHXrPkUEyl
2330  Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short legs
2331  Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. Big
2332  Look at this jokester thinking seat belt laws don't apply to him. Great tongue th
2333  This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall very
2334  This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat hi
2335  This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood floc
2336  Can take selfies 11/10 https://t.co/ws2AMaNwPW
2337  Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIikp
2338  Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpris
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 confirme
2342  Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/1C
2343  Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely camou
2344  Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good ton
2345  This is the happiest dog you will ever see. Very committed owner. Nice couch. 10/
2346  Here is the Rand Paul of retrievers folks! He's probably good at poker. Can drink
2347  My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather doc
2348  Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would dc
2349  This is an odd dog. Hard on the outside but loving on the inside. Petting still f
2350  This is a truly beautiful English Wilson Staff retriever. Has a nice phone. Privi
2351  Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Cannot
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2352  This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like he
2353  Here is a very happy pup. Big fan of well-maintained decks. Just look at that ton
2354  This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs her
2355  Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relaxin


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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.c
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6     https://gofundme.com/ydvmve-surgery-for-jax,https://twitter.com/dog_rates/status/
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27    https://www.gofundme.com/mingusneedsus,https://twitter.com/dog_rates/status/88673
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4     12                10
5     13                10
6     13                10
7     13                10
8     13                10
9     14                10
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29    12            10
31    13            10
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2337  10            10
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2342  6             10
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2346  8             10
2347  9             10
2348  10            10
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1       1.0       Chihuahua                          ...
2       1.0       Chihuahua                          ...
3       1.0       paper_towel                        ...
4       2.0       basset                             ...
5       1.0       Chesapeake_Bay_retriever           ...
6       1.0       Appenzeller                        ...
7       2.0       Pomeranian                         ...
8       1.0       Irish_terrier                      ...
9       1.0       Pembroke                           ...
10      1.0       Samoyed                            ...
11      1.0       French_bulldog                     ...
12      1.0       Pembroke                           ...
13      1.0       French_bulldog                     ...
14      1.0       golden_retriever                   ...
15      1.0       whippet                            ...
16      1.0       golden_retriever                   ...
17      1.0       golden_retriever                   ...
18      3.0       Siberian_husky                     ...
20      1.0       French_bulldog                     ...
21      1.0       basset                             ...
22      1.0       limousine                          ...
23      2.0       Pembroke                           ...
24      1.0       Mexican_hairless                   ...
25      1.0       Samoyed                            ...
26      2.0       Chihuahua                          ...
27      1.0       kuvasz                             ...
28      1.0       convertible                        ...
29      1.0       French_bulldog                     ...
31      1.0       pug                                ...
...     ...       ...                                ...
2326    1.0       coho                               ...
2327    1.0       black-and-tan_coonhound            ...
2328    1.0       Chihuahua                          ...
2329    1.0       soft-coated_wheaten_terrier        ...
2330    1.0       guinea_pig                         ...
2331    1.0       malamute                           ...
2332    1.0       golden_retriever                   ...
2333    1.0       ox                                 ...
2334    1.0       three-toed_sloth                   ...
2335    1.0       Maltese_dog                        ...
2336    1.0       Italian_greyhound                  ...
2337    1.0       desktop_computer                   ...
2338    1.0       hen                                ...
2339    1.0       English_setter                     ...
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2340  1.0       Lhasa                          ...
2341  1.0       bloodhound                     ...
2342  1.0       pug                            ...
2343  1.0       Walker_hound                   ...
2344  1.0       Gordon_setter                  ...
2345  1.0       golden_retriever               ...
2346  1.0       miniature_poodle               ...
2347  1.0       shopping_cart                  ...
2348  1.0       chow                           ...
2349  1.0       box_turtle                     ...
2350  1.0       Bernese_mountain_dog           ...
2351  1.0       miniature_pinscher             ...
2352  1.0       Rhodesian_ridgeback            ...
2353  1.0       German_shepherd                ...
2354  1.0       redbone                        ...
2355  1.0       Welsh_springer_spaniel         ...
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                                  p2  p2_conf p2_dog                                   p3  \
0     bagel                           0.085851 False  banana
1     Pekinese                        0.090647 True   papillon
2     malamute                        0.078253 True   kelpie
3     Labrador_retriever              0.168086 True   spatula
4     English_springer                0.225770 True   German_short-haired_pointer
5     Irish_terrier                   0.116317 True   Indian_elephant
6     Border_collie                   0.199287 True   ice_lolly
7     Eskimo_dog                      0.178406 True   Pembroke
8     Irish_setter                    0.193054 True   Chesapeake_Bay_retriever
9     Cardigan                        0.451038 True   Chihuahua
10    Pomeranian                      0.013884 True   chow
11    Labrador_retriever              0.151317 True   muzzle
12    Cardigan                        0.027356 True   basenji
13    boxer                           0.002129 True   Staffordshire_bullterrier
14    Labrador_retriever              0.013834 True   redbone
15    borzoi                          0.194742 True   Saluki
16    Tibetan_mastiff                 0.120184 True   Labrador_retriever
17    Labrador_retriever              0.184172 True   English_setter
18    Eskimo_dog                      0.166511 True   malamute
20    pug                             0.000932 True   bull_mastiff
21    redbone                         0.087582 True   Weimaraner
22    tow_truck                       0.029175 False  shopping_cart
23    Rhodesian_ridgeback             0.054950 True   beagle
24    sea_lion                        0.275645 False  Weimaraner
25    Eskimo_dog                      0.035029 True   Staffordshire_bullterrier
26    toy_terrier                     0.143528 True   can_opener
27    Great_Pyrenees                  0.186136 True   Dandie_Dinmont
28    sports_car                      0.139952 False  car_wheel
29    Chihuahua                       0.000361 True   Boston_bull
31    shower_cap                      0.025286 False  Siamese_cat
```

```
  ...         ...                      ...    ...          ...
2326  barracouta                    0.271485  False  gar
2327  bloodhound                    0.244220  True   flat-coated_retriever
2328  toy_terrier                   0.009397  True   papillon
2329  Afghan_hound                  0.259551  True   briard
2330  skunk                         0.002402  False  hamster
2331  Siberian_husky                0.147655  True   Eskimo_dog
2332  Chesapeake_Bay_retriever      0.054787  True   Labrador_retriever
2333  Newfoundland                  0.278407  True   groenendael
2334  otter                         0.015250  False  great_grey_owl
2335  toy_poodle                    0.063064  True   miniature_poodle
2336  toy_terrier                   0.111884  True   basenji
2337  desk                          0.085547  False  bookcase
2338  cock                          0.033919  False  partridge
2339  Newfoundland                  0.149842  True   borzoi
2340  Shih-Tzu                      0.166192  True   Dandie_Dinmont
2341  German_shepherd               0.078260  True   malinois
2342  bull_mastiff                  0.404722  True   French_bulldog
2343  English_foxhound              0.175382  True   Ibizan_hound
2344  Yorkshire_terrier             0.174201  True   Pekinese
2345  Tibetan_mastiff               0.093718  True   Labrador_retriever
2346  komondor                      0.192305  True   soft-coated_wheaten_terrier
2347  shopping_basket               0.014594  False  golden_retriever
2348  Tibetan_mastiff               0.058279  True   fur_coat
2349  mud_turtle                    0.045885  False  terrapin
2350  English_springer              0.263788  True   Greater_Swiss_Mountain_dog
2351  Rottweiler                    0.243682  True   Doberman
2352  redbone                       0.360687  True   miniature_pinscher
2353  malinois                      0.138584  True   bloodhound
2354  miniature_pinscher            0.074192  True   Rhodesian_ridgeback
2355  collie                        0.156665  True   Shetland_sheepdog

      p3_conf  p3_dog  retweet_count  farvorite_count  dog_stage  dog_names
0     0.076110  False  8328.0         38075.0          NaN        Phineas
1     0.068957  True   6151.0         32683.0          NaN        Tilly
2     0.031379  True   4072.0         24595.0          NaN        Archie
3     0.040836  False  8472.0         41435.0          NaN        Darla
4     0.175219  True   9166.0         39610.0          NaN        Franklin
5     0.076902  False  3051.0         19891.0          NaN        NaN
6     0.193548  False  2022.0         11622.0          NaN        Jax
7     0.076507  True   18480.0        64241.0          NaN        NaN
8     0.118184  True   4189.0         27327.0          NaN        Zoey
9     0.029248  True   7225.0         31350.0          doggo      Cassie
10    0.008167  True   7182.0         30133.0          NaN        Koda
11    0.082981  False  4874.0         27312.0          NaN        Bruno
12    0.004633  True   9848.0         47271.0          puppo      NaN
13    0.001498  True   4443.0         26680.0          NaN        Ted
14    0.007958  True   2202.0         14853.0          puppo      Stuart
```

15	0.027351	True	5264.0	24802.0	NaN	Oliver
16	0.105506	True	4405.0	28618.0	NaN	Jim
17	0.073482	True	4204.0	25111.0	NaN	Zeke
18	0.111411	True	3478.0	19485.0	NaN	Ralphus
20	0.000903	True	3421.0	21376.0	NaN	Gerald
21	0.026236	True	5278.0	29664.0	NaN	Jeffrey
22	0.026321	False	11445.0	45474.0	NaN	NaN
23	0.038915	True	17804.0	67865.0	NaN	Canela
24	0.134203	True	10192.0	33111.0	NaN	NaN
25	0.029705	True	5844.0	30050.0	NaN	NaN
26	0.032253	False	7617.0	34554.0	NaN	Maya
27	0.086346	True	3216.0	11846.0	NaN	Mingus
28	0.044173	False	4372.0	22046.0	NaN	Derek
29	0.000076	True	3138.0	20825.0	pupper	Roscoe
31	0.002849	False	6163.0	27511.0	NaN	Waffles
...	...	...	...	...	...	...
2326	0.189945	False	NaN	NaN	NaN	NaN
2327	0.173810	True	NaN	NaN	NaN	NaN
2328	0.004577	True	NaN	NaN	NaN	NaN
2329	0.206803	True	NaN	NaN	NaN	NaN
2330	0.000461	False	NaN	NaN	NaN	NaN
2331	0.093412	True	NaN	NaN	NaN	NaN
2332	0.014241	True	NaN	NaN	NaN	NaN
2333	0.102643	True	NaN	NaN	NaN	NaN
2334	0.013207	False	NaN	NaN	NaN	NaN
2335	0.025581	True	NaN	NaN	NaN	NaN
2336	0.111152	True	NaN	NaN	NaN	NaN
2337	0.079480	False	NaN	NaN	NaN	NaN
2338	0.000052	False	NaN	NaN	NaN	NaN
2339	0.133649	True	NaN	NaN	NaN	NaN
2340	0.089688	True	NaN	NaN	NaN	NaN
2341	0.075628	True	NaN	NaN	NaN	NaN
2342	0.048960	True	NaN	NaN	NaN	NaN
2343	0.097471	True	NaN	NaN	NaN	NaN
2344	0.109454	True	NaN	NaN	NaN	NaN
2345	0.072427	True	NaN	NaN	NaN	NaN
2346	0.082086	True	NaN	NaN	NaN	NaN
2347	0.007959	True	NaN	NaN	NaN	NaN
2348	0.054449	False	NaN	NaN	NaN	NaN
2349	0.017885	False	NaN	NaN	NaN	NaN
2350	0.016199	True	NaN	NaN	NaN	NaN
2351	0.154629	True	NaN	NaN	NaN	NaN
2352	0.222752	True	NaN	NaN	NaN	NaN
2353	0.116197	True	NaN	NaN	NaN	NaN
2354	0.072010	True	NaN	NaN	NaN	NaN
2355	0.061428	True	NaN	NaN	NaN	NaN

[1994 rows x 22 columns]

```
In [32]: #Convert each column to its appropriate type
         df_all['tweet_id'] = df_all['tweet_id'].astype(object)
         df_all['timestamp'] = pd.to_datetime(df_all.timestamp)
         df_all['source'] = df_all['source'].astype('category')
         df_all['dog_stage'] = df_all['dog_stage'].astype('category')
         df_all['rating_numerator'] = df_all['rating_numerator'].astype(float)
         df_all['rating_denominator'] = df_all['rating_denominator'].astype(float)

         # Issue #1 solved
         df_all.dtypes

Out[32]: tweet_id                object
         timestamp               datetime64[ns]
         source                  category
         text                    object
         expanded_urls           object
         rating_numerator        float64
         rating_denominator      float64
         jpg_url                 object
         img_num                 float64
         p1                      object
         p1_conf                 float64
         p1_dog                  object
         p2                      object
         p2_conf                 float64
         p2_dog                  object
         p3                      object
         p3_conf                 float64
         p3_dog                  object
         retweet_count           float64
         farvorite_count         float64
         dog_stage               category
         dog_names               object
         dtype: object

In [33]: # To make 'source' column easier to read, we need to remove the embedded url
         df_all['source'] = df_all['source'].str.replace('<a href="http://twitter.com/download/i
         df_all['source'] = df_all['source'].str.replace('<a href="http://vine.co" rel="nofollow
         df_all['source'] = df_all['source'].str.replace('<a href="http://twitter.com" rel="nofo
         df_all['source'] = df_all['source'].str.replace('<a href="https://about.twitter.com/pro
         #This will solve Issue #7 stated above

In [34]: # Rename columns to be more specific and detailed
         df_all = df_all.rename(columns = {'timestamp': 'tweet_date', 'source': 'tweet_source',
         #This will solve Issue #6 stated above

In [35]: # View rows which contain '&amp;' instead of '&' in 'tweet_content' column
         df_all[df_all.tweet_content.str.contains('&amp;')]
```

31

```
Out[35]:             tweet_id          tweet_date         tweet_source  \
      262   842765311967449089 2017-03-17 15:51:22 Twitter for iPhone
      320   834458053273591808 2017-02-22 17:41:18 Twitter for iPhone
      461   817536400337801217 2017-01-07 01:00:41 Twitter for iPhone
      516   810984652412424192 2016-12-19 23:06:23 Twitter for iPhone
      799   772826264096874500 2016-09-05 15:58:34 Twitter for iPhone
      889   759793422261743616 2016-07-31 16:50:42 Twitter for iPhone
      898   758854675097526272 2016-07-29 02:40:28 Twitter for iPhone
      976   750026558547456000 2016-07-04 18:00:41 TweetDeck
     1104   735137028879360001 2016-05-24 15:55:00 Twitter for iPhone
     1179   719367763014393856 2016-04-11 03:33:34 Twitter for iPhone
     1199   716791146589110272 2016-04-04 00:55:01 Twitter for iPhone
     1222   714258258790387713 2016-03-28 01:10:13 Twitter for iPhone
     1274   709198395643068416 2016-03-14 02:04:08 Twitter for iPhone
     1366   702671118226825216 2016-02-25 01:47:04 Twitter for iPhone
     1421   698195409219559425 2016-02-12 17:22:12 Twitter for iPhone
     1465   694352839993344000 2016-02-02 02:53:12 Twitter for iPhone
     1481   693280720173801472 2016-01-30 03:52:58 Twitter for iPhone
     1508   691483041324204033 2016-01-25 04:49:38 Twitter for iPhone
     1524   690597161306841088 2016-01-22 18:09:28 Twitter for iPhone
     1538   689835978131935233 2016-01-20 15:44:48 Twitter for iPhone
     1569   687807801670897665 2016-01-15 01:25:33 Twitter for iPhone
     1593   686386521809772549 2016-01-11 03:17:53 Twitter for iPhone
     1621   684926975086034944 2016-01-07 02:38:10 Twitter for iPhone
     1646   683834909291606017 2016-01-04 02:18:42 Twitter for iPhone
     1707   680801747103793152 2015-12-26 17:25:59 Twitter for iPhone
     1763   678446151570427904 2015-12-20 05:25:42 Twitter for iPhone
     1795   677314812125323265 2015-12-17 02:30:09 Twitter for iPhone
     1812   676811746707918848 2015-12-15 17:11:09 Twitter for iPhone
     1817   676603393314578432 2015-12-15 03:23:14 Twitter for iPhone
     1842   675870721063669760 2015-12-13 02:51:51 Twitter for iPhone
     1897   674737130913071104 2015-12-09 23:47:22 Twitter for iPhone
     1899   674670581682434048 2015-12-09 19:22:56 Twitter for iPhone
     1901   674646392044941312 2015-12-09 17:46:48 Twitter for iPhone
     1913   674372068062928900 2015-12-08 23:36:44 Twitter for iPhone
     1931   674036086168010753 2015-12-08 01:21:40 Twitter for iPhone
     2031   671768281401958400 2015-12-01 19:10:13 Twitter for iPhone
     2037   671561002136281088 2015-12-01 05:26:34 Twitter for iPhone
     2064   671154572044468225 2015-11-30 02:31:34 Twitter for iPhone
     2084   670807719151067136 2015-11-29 03:33:17 Twitter for iPhone
     2096   670755717859713024 2015-11-29 00:06:39 Twitter for iPhone
     2137   670046952931721218 2015-11-27 01:10:17 Twitter for iPhone
     2177   669037058363662336 2015-11-24 06:17:19 Twitter for iPhone
     2190   668960084974809088 2015-11-24 01:11:27 Twitter for iPhone
     2196   668852170888998912 2015-11-23 18:02:38 Twitter for iPhone
     2207   668627278264475648 2015-11-23 03:09:00 Twitter for iPhone
     2210   668620235289837568 2015-11-23 02:41:01 Twitter for iPhone
     2216   668537837512433665 2015-11-22 21:13:35 Twitter for iPhone
```

```
2232  668221241640230912  2015-11-22  00:15:33   Twitter for iPhone
2246  667878741721415682  2015-11-21  01:34:35   Twitter for iPhone
2268  667517642048163840  2015-11-20  01:39:42   Twitter Web Client
2293  667152164079423490  2015-11-19  01:27:25   Twitter for iPhone
2306  666835007768551424  2015-11-18  04:27:09   Twitter for iPhone


262   Meet Indie. She's not a fan of baths but she's definitely a fan of hide &amp; see
320   Meet Chester (bottom) &amp; Harold (top). They are different dogs not only in app
461   Say hello to Eugene &amp; Patti Melt. No matter how dysfunctional they get, they
516   Meet Sam. She smiles 24/7 &amp; secretly aspires to be a reindeer. \nKeep Sam smi
799   Meet Roosevelt. He's preparing for takeoff. Make sure tray tables are in their fu
889   Meet Maggie &amp; Lila. Maggie is the doggo, Lila is the pupper. They are sisters
898   This is Lilli Bee &amp; Honey Bear. Unfortunately, they were both born with no ey
976   Meet Jax &amp; Jil. Jil is yelling the pledge of allegiance. If u cant take the f
1104  Meet Buckley. His family &amp; some neighbors came over to watch him perform but
1179  Meet Sid &amp; Murphy. Murphy floats alongside Sid and whispers motivational quot
1199  Meet Jennifur. She's supposed to be navigating. Not even buckled up. Insubordinat
1222  Meet Travis and Flurp. Travis is pretty chill but Flurp can't lie down properly.
1274  From left to right:\nCletus, Jerome, Alejandro, Burp, &amp; Titson\nNone know whe
1366  Meet Rambo &amp; Kiwi. Rambo's the pup with the sharp toes &amp; rad mohawk. One
1421  Meet Beau &amp; Wilbur. Wilbur stole Beau's bed from him. Wilbur now has so much
1465  Meet Oliviér. He takes killer selfies. Has a dog of his own. It leaps at random &
1481  This is Sadie and her 2 pups Shebang &amp; Ruffalo. Sadie says single parenting i
1508  When bae says they can't go out but you see them with someone else that same nigh
1524  This is Lolo. She's America af. Behind in science &amp; math but can say whatever
1538  Meet Fynn &amp; Taco. Fynn is an all-powerful leaf lord and Taco is in the wrong
1569  Meet Trooper &amp; Maya. Trooper protects Maya from bad things like dognappers an
1593  Say hello to Crimson. He's a Speckled Winnebago. Main passions are air hockey &am
1621  Meet Bruiser &amp; Charlie. They are the best of pals. Been through it all togeth
1646  Here we see a faulty pupper. Might need to replace batteries. Try turning off &am
1707  Great picture here. Dog on the right panicked &amp; forgot about his tongue. Midd
1763  Touching scene here. Really stirs up the emotions. The bond between father &amp;
1795  Meet Tassy &amp; Bee. Tassy is pretty chill, but Bee is convinced the Ruffles are
1812  Say hello to Penny &amp; Gizmo. They are practicing their caroling. The ambition
1817  This is Godzilla pupper. He had a ruff childhood &amp; now deflects that pain out
1842  &amp; this is Yoshi. Another world record contender 11/10 (what the hell is happe
1897  Meet Rufio. He is unaware of the pink legless pupper wrapped around him. Might wa
1899  Meet Jeb &amp; Bush. Jeb is somehow stuck in that fence and Bush won't stop whisp
1901  Two gorgeous dogs here. Little waddling dog is a rebel. Refuses to look at camera
1913  Meet Chesney. On the outside he stays calm &amp; collected. On the inside he's ha
1931  Meet Daisy. She has no eyes &amp; her face has been blurry since birth. Quite the
2031  When you try to recreate the scene from Lady &amp; The Tramp but then remember yo
2037  This is the best thing I've ever seen so spread it like wildfire &amp; maybe we'l
2064  Meet Holly. She's trying to teach small human-like pup about blocks but he's not
2084  Say hello to Andy. He can balance on one foot, obliterate u in checkers, &amp; tr
2096  Say hello to Gin &amp; Tonic. They're having a staring contest. Very very intense
2137  This is Ben &amp; Carson. It's impossible for them to tilt their heads in the sam
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2177   Here we have Pancho and Peaches. Pancho is a Condoleezza Gryffindor, and Peaches
2190   Meet Jaycob. He got scared of the vacuum. Hide &amp; seek champ. Almost better th
2196   Say hello to Bobb. Bobb is a Golden High Fescue &amp; a proud father of 8. Bobb s
2207   This is Timofy. He's a pilot for Southwest. It's Christmas morning &amp; everyone
2210   Say hello to Kallie. There was a tornado in the area &amp; the news guy said ever
2216   This is Spark. He's nervous. Other dog hasn't moved in a while. Won't come when c
2232   These two dogs are Bo &amp; Smittens. Smittens is trying out a new deodorant and
2246   This is Tedrick. He lives on the edge. Needs someone to hit the gas tho. Other th
2268   This is Dook &amp; Milo. Dook is struggling to find who he really is and Milo is
2293   This is Pipsy. He is a fluffball. Enjoys traveling the sea &amp; getting tangled
2306   These are Peruvian Feldspars. Their names are Cupit and Prencer. Both resemble Ra


262    https://www.gofundme.com/get-indie-home/,https://twitter.com/dog_rates/status/842
320    https://twitter.com/dog_rates/status/834458053273591808/photo/1
461    https://twitter.com/dog_rates/status/817536400337801217/photo/1,https://twitter.c
516    https://www.gofundme.com/sams-smile,https://twitter.com/dog_rates/status/81098465
799    https://twitter.com/dog_rates/status/772826264096874500/photo/1
889    https://twitter.com/dog_rates/status/759793422261743616/photo/1,https://twitter.c
898    https://twitter.com/dog_rates/status/758854675097526272/photo/1,https://twitter.c
976    https://twitter.com/dog_rates/status/750026558547456000/photo/1
1104   https://twitter.com/dog_rates/status/735137028879360001/photo/1
1179   https://twitter.com/dog_rates/status/719367763014393856/photo/1
1199   https://twitter.com/dog_rates/status/716791146589110272/photo/1
1222   https://twitter.com/dog_rates/status/714258258790387713/photo/1
1274   https://twitter.com/dog_rates/status/709198395643068416/photo/1
1366   https://twitter.com/dog_rates/status/702671118226825216/photo/1
1421   https://twitter.com/dog_rates/status/698195409219559425/photo/1
1465   https://twitter.com/dog_rates/status/694352839993344000/photo/1,https://twitter.c
1481   https://twitter.com/dog_rates/status/693280720173801472/photo/1
1508   https://twitter.com/dog_rates/status/691483041324204033/photo/1,https://twitter.c
1524   https://twitter.com/dog_rates/status/690597161306841088/photo/1
1538   https://twitter.com/dog_rates/status/689835978131935233/photo/1
1569   https://twitter.com/dog_rates/status/687807801670897665/photo/1
1593   https://twitter.com/dog_rates/status/686386521809772549/photo/1
1621   https://twitter.com/dog_rates/status/684926975086034944/photo/1
1646   https://twitter.com/dog_rates/status/683834909291606017/video/1
1707   https://twitter.com/dog_rates/status/680801747103793152/photo/1
1763   https://twitter.com/dog_rates/status/678446151570427904/photo/1
1795   https://twitter.com/dog_rates/status/677314812125323265/photo/1,https://twitter.c
1812   https://twitter.com/dog_rates/status/676811746707918848/photo/1
1817   https://twitter.com/dog_rates/status/676603393314578432/photo/1
1842   https://twitter.com/dog_rates/status/675870721063669760/photo/1
1897   https://twitter.com/dog_rates/status/674737130913071104/photo/1
1899   https://twitter.com/dog_rates/status/674670581682434048/photo/1
1901   https://twitter.com/dog_rates/status/674646392044941312/photo/1
1913   https://twitter.com/dog_rates/status/674372068062928900/photo/1
1931   https://twitter.com/dog_rates/status/674036086168010753/photo/1
```

```
2031   https://twitter.com/dog_rates/status/671768281401958400/photo/1,https://twitter.c
2037   https://twitter.com/dog_rates/status/671561002136281088/photo/1
2064   https://twitter.com/dog_rates/status/671154572044468225/photo/1
2084   https://twitter.com/dog_rates/status/670807719151067136/photo/1,https://twitter.c
2096   https://twitter.com/dog_rates/status/670755717859713024/photo/1
2137   https://twitter.com/dog_rates/status/670046952931721218/photo/1
2177   https://twitter.com/dog_rates/status/669037058363662336/photo/1
2190   https://twitter.com/dog_rates/status/668960084974809088/photo/1
2196   https://twitter.com/dog_rates/status/668852170888998912/photo/1
2207   https://twitter.com/dog_rates/status/668627278264475648/photo/1
2210   https://twitter.com/dog_rates/status/668620235289837568/photo/1
2216   https://twitter.com/dog_rates/status/668537837512433665/photo/1
2232   https://twitter.com/dog_rates/status/668221241640230912/photo/1
2246   https://twitter.com/dog_rates/status/667878741721415682/photo/1
2268   https://twitter.com/dog_rates/status/667517642048163840/photo/1
2293   https://twitter.com/dog_rates/status/667152164079423490/photo/1
2306   https://twitter.com/dog_rates/status/666835007768551424/photo/1


       rating_numerator  rating_denominator  \
262    12.0               10.0
320    12.0               10.0
461    12.0               10.0
516    24.0               7.0
799    11.0               10.0
889    12.0               10.0
898    11.0               10.0
976    10.0               10.0
1104   9.0                10.0
1179   11.0               10.0
1199   11.0               10.0
1222   10.0               10.0
1274   45.0               50.0
1366   10.0               10.0
1421   9.0                10.0
1465   10.0               10.0
1481   10.0               10.0
1508   5.0                10.0
1524   11.0               10.0
1538   11.0               10.0
1569   11.0               10.0
1593   11.0               10.0
1621   11.0               10.0
1646   9.0                10.0
1707   10.0               10.0
1763   10.0               10.0
1795   10.0               10.0
1812   9.0                10.0
1817   9.0                10.0
```

```
1842  11.0            10.0
1897  10.0            10.0
1899  9.0             10.0
1901  5.0             10.0
1913  10.0            10.0
1931  9.0             10.0
2031  10.0            10.0
2037  13.0            10.0
2064  11.0            10.0
2084  11.0            10.0
2096  9.0             10.0
2137  11.0            10.0
2177  10.0            10.0
2190  10.0            10.0
2196  11.0            10.0
2207  9.0             10.0
2210  10.0            10.0
2216  8.0             10.0
2232  10.0            10.0
2246  2.0             10.0
2268  8.0             10.0
2293  12.0            10.0
2306  10.0            10.0
```

tweet_picture_pre

```
262   https://pbs.twimg.com/media/C7IalMVX0AATKRD.jpg
320   https://pbs.twimg.com/media/C5SXK89XUAQg7GX.jpg
461   https://pbs.twimg.com/media/C1h4_MEXUAARxQF.jpg
516   https://pbs.twimg.com/media/C0EyPZbXAAAceSc.jpg
799   https://pbs.twimg.com/media/CrmhYYIXEAEcyYY.jpg
889   https://pbs.twimg.com/media/CotUFZEWcAA2Pku.jpg
898   https://pbs.twimg.com/media/Cof-SuqVYAAs4kZ.jpg
976   https://pbs.twimg.com/media/CmieRQRXgAA8MV3.jpg
1104  https://pbs.twimg.com/media/CjO7OfeWgAAUQy-.jpg
1179  https://pbs.twimg.com/media/Cfu1KSRXEAACC5X.jpg
1199  https://pbs.twimg.com/media/CfKNvU8WsAAvI9Z.jpg
1222  https://pbs.twimg.com/media/CemOGNjWQAEoN7R.jpg
1274  https://pbs.twimg.com/media/CdeUKpcWoAAJAWJ.jpg
1366  https://pbs.twimg.com/media/CcBjp2nWoAA8w-2.jpg
1421  https://pbs.twimg.com/media/CbB9BTqW8AEVc2A.jpg
1465  https://pbs.twimg.com/media/CaLWOPfWkAAo2Dt.jpg
1481  https://pbs.twimg.com/media/CZ8HIsGWIAA9eXX.jpg
1508  https://pbs.twimg.com/media/CZikKBIWYAA40Az.jpg
1524  https://pbs.twimg.com/media/CZV-c9NVIAEWtiU.jpg
1538  https://pbs.twimg.com/media/CZLKJpDWQAA-5u4.jpg
1569  https://pbs.twimg.com/media/CYuVi9pWwAAbOGC.jpg
1593  https://pbs.twimg.com/media/CYaI5aaW8AE8Uyk.jpg
1621  https://pbs.twimg.com/media/CYFZXdiUOAAc_kw.jpg
```

```
1646  https://pbs.twimg.com/ext_tw_video_thumb/683834825250320385/pu/img/yZdrqMlyky4KGC
1707  https://pbs.twimg.com/media/CXKxkseW8AAjAMY.jpg
1763  https://pbs.twimg.com/media/CWpTLOYWsAEDhcU.jpg
1795  https://pbs.twimg.com/media/CWZOOIUW4AAQrX_.jpg
1812  https://pbs.twimg.com/media/CWSEsO9WwAAX-fZ.jpg
1817  https://pbs.twimg.com/media/CWPHMqKVAAAE78E.jpg
1842  https://pbs.twimg.com/media/CWEs1b-WEAEhq82.jpg
1897  https://pbs.twimg.com/media/CVOl1OAU8AAfg-a.jpg
1899  https://pbs.twimg.com/media/CVzpUGUWUAAo7Vn.jpg
1901  https://pbs.twimg.com/media/CVzTUGrW4AAirJH.jpg
1913  https://pbs.twimg.com/media/CVvZOKTWwAAdXKV.jpg
1931  https://pbs.twimg.com/media/CVqoPslWEAEk7EC.jpg
2031  https://pbs.twimg.com/media/CVKZsHtWwAA6gPj.jpg
2037  https://pbs.twimg.com/media/CVHdK-7WwAAsuyc.jpg
2064  https://pbs.twimg.com/media/CVBrhXoWIAAox_C.jpg
2084  https://pbs.twimg.com/media/CU8v-rdXIAId12Z.jpg
2096  https://pbs.twimg.com/media/CU8AwZ_UsAA-Lbu.jpg
2137  https://pbs.twimg.com/media/CUx8JSEXIAU6zPp.jpg
2177  https://pbs.twimg.com/media/CUjlp51WcAA1vGA.jpg
2190  https://pbs.twimg.com/media/CUifpn4WUAAS5X3.jpg
2196  https://pbs.twimg.com/media/CUg9gBvWoAAmx-2.jpg
2207  https://pbs.twimg.com/media/CUdw9thWsAA4mB9.jpg
2210  https://pbs.twimg.com/media/CUdqjvAWUAANfoU.jpg
2216  https://pbs.twimg.com/media/CUcfnWlWsAAzlwE.jpg
2232  https://pbs.twimg.com/media/CUX_rAyWsAYZOQ5.jpg
2246  https://pbs.twimg.com/media/CUTILFiWcAE8Rle.jpg
2268  https://pbs.twimg.com/media/CUN_wiBUkAAakTO.jpg
2293  https://pbs.twimg.com/media/CUIzWk_UwAAfUNq.jpg
2306  https://pbs.twimg.com/media/CUES51dXIAEahyG.jpg

      img_num                        p1      ...          \
262   1.0      tub                           ...
320   1.0      Rhodesian_ridgeback           ...
461   2.0      pug                           ...
516   1.0      golden_retriever              ...
799   1.0      basset                        ...
889   2.0      golden_retriever              ...
898   4.0      barrow                        ...
976   1.0      standard_poodle               ...
1104  1.0      Walker_hound                  ...
1179  1.0      swing                         ...
1199  1.0      Pomeranian                    ...
1222  1.0      collie                        ...
1274  1.0      borzoi                        ...
1366  1.0      bloodhound                    ...
1421  1.0      Labrador_retriever            ...
1465  2.0      Australian_terrier            ...
1481  1.0      Labrador_retriever            ...
```

```
1508  1.0      bloodhound                 ...
1524  1.0      Lhasa                      ...
1538  1.0      collie                     ...
1569  1.0      Staffordshire_bullterrier  ...
1593  1.0      Yorkshire_terrier          ...
1621  1.0      Labrador_retriever         ...
1646  1.0      Maltese_dog                ...
1707  1.0      pug                        ...
1763  1.0      Staffordshire_bullterrier  ...
1795  2.0      Blenheim_spaniel           ...
1812  1.0      Chihuahua                  ...
1817  1.0      whippet                    ...
1842  1.0      golden_retriever           ...
1897  1.0      Pomeranian                 ...
1899  1.0      malamute                   ...
1901  1.0      flat-coated_retriever      ...
1913  1.0      seashore                   ...
1931  1.0      toy_poodle                 ...
2031  2.0      Chihuahua                  ...
2037  1.0      Gordon_setter              ...
2064  1.0      Labrador_retriever         ...
2084  1.0      Old_English_sheepdog       ...
2096  1.0      keeshond                   ...
2137  1.0      Blenheim_spaniel           ...
2177  1.0      Chihuahua                  ...
2190  1.0      shower_curtain             ...
2196  1.0      golden_retriever           ...
2207  1.0      French_bulldog             ...
2210  1.0      crash_helmet               ...
2216  1.0      Lakeland_terrier           ...
2232  1.0      chow                       ...
2246  1.0      seat_belt                  ...
2268  1.0      Italian_greyhound          ...
2293  1.0      toy_poodle                 ...
2306  1.0      Airedale                   ...

                            p2    p2_conf p2_dog  \
262   bucket                      0.105166 False
320   whippet                     0.177531 True
461   French_bulldog              0.028518 True
516   Tibetan_mastiff             0.036708 True
799   Walker_hound                0.072416 True
889   Labrador_retriever          0.001948 True
898   Old_English_sheepdog        0.023791 True
976   teddy                       0.130760 False
1104  beagle                      0.233891 True
1179  soft-coated_wheaten_terrier 0.050971 True
1199  seat_belt                   0.154652 False
```

```
1222   Chesapeake_Bay_retriever         0.101834   True
1274   wire-haired_fox_terrier          0.083513   True
1366   Sussex_spaniel                   0.212017   True
1421   American_Staffordshire_terrier   0.102684   True
1465   Yorkshire_terrier                0.328173   True
1481   bull_mastiff                     0.175316   True
1508   black-and-tan_coonhound          0.077420   True
1524   koala                            0.091934   False
1538   Shetland_sheepdog                0.298939   True
1569   boxer                            0.135697   True
1593   silky_terrier                    0.171673   True
1621   golden_retriever                 0.144893   True
1646   toy_poodle                       0.102992   True
1707   Labrador_retriever               0.001439   True
1763   Rottweiler                       0.189434   True
1795   Japanese_spaniel                 0.054790   True
1812   Pomeranian                       0.345806   True
1817   Great_Dane                       0.034182   True
1842   Welsh_springer_spaniel           0.184193   True
1897   schipperke                       0.014310   True
1899   Eskimo_dog                       0.178033   True
1901   groenendael                      0.086166   True
1913   American_alligator               0.106404   False
1931   miniature_poodle                 0.151936   True
2031   French_bulldog                   0.112796   True
2037   black-and-tan_coonhound          0.270893   True
2064   Chesapeake_Bay_retriever         0.350188   True
2084   Sealyham_terrier                 0.013892   True
2096   Norwegian_elkhound               0.001827   True
2137   beagle                           0.000647   True
2177   Pomeranian                       0.053871   True
2190   Chesapeake_Bay_retriever         0.165878   True
2196   Tibetan_mastiff                  0.041497   True
2207   pug                              0.008604   True
2210   toaster                          0.037497   False
2216   toy_poodle                       0.250445   True
2232   golden_retriever                 0.372115   True
2246   miniature_pinscher               0.106003   True
2268   standard_poodle                  0.084572   True
2293   Pomeranian                       0.087544   True
2306   toy_poodle                       0.124030   True

                           p3   p3_conf p3_dog  retweet_count  \
262    Labrador_retriever        0.029340   True   1357.0
320    redbone                   0.106552   True   1810.0
461    Boston_bull               0.000086   True   3319.0
516    Labrador_retriever        0.025823   True   1571.0
799    beagle                    0.008229   True   2535.0
```

```
889    kuvasz                          0.001752  True   2053.0
898    komondor                        0.001246  True   968.0
976    toy_poodle                      0.071726  True   849.0
1104   English_foxhound                0.164943  True   1032.0
1179   Tibetan_terrier                 0.047759  True   786.0
1199   golden_retriever                0.125017  True   1524.0
1222   beagle                          0.101294  True   761.0
1274   English_setter                  0.083184  True   682.0
1366   clumber                         0.128622  True   600.0
1421   dalmatian                       0.050008  True   6356.0
1465   silky_terrier                   0.108404  True   663.0
1481   box_turtle                      0.164337  False  1323.0
1508   Gordon_setter                   0.009826  True   603.0
1524   sunglasses                      0.091505  False  644.0
1538   borzoi                          0.022616  True   805.0
1569   American_Staffordshire_terrier  0.086591  True   750.0
1593   Australian_terrier              0.088334  True   940.0
1621   lion                            0.021440  False  500.0
1646   Samoyed                         0.023247  True   1189.0
1707   Staffordshire_bullterrier       0.000518  True   887.0
1763   American_Staffordshire_terrier  0.189430  True   1666.0
1795   Chihuahua                       0.008204  True   568.0
1812   cocker_spaniel                  0.060331  True   NaN
1817   boxer                           0.028404  True   NaN
1842   beagle                          0.182241  True   NaN
1897   Chihuahua                       0.008120  True   NaN
1899   Siberian_husky                  0.077966  True   NaN
1901   Labrador_retriever              0.016052  True   NaN
1913   sandbar                         0.049349  False  NaN
1931   Maltese_dog                     0.045531  True   NaN
2031   Italian_greyhound               0.062893  True   NaN
2037   Rottweiler                      0.153233  True   NaN
2064   golden_retriever                0.142400  True   NaN
2084   Border_collie                   0.004601  True   NaN
2096   cairn                           0.001821  True   NaN
2137   Brittany_spaniel                0.000392  True   NaN
2177   chow                            0.032257  True   NaN
2190   bathtub                         0.056726  False  NaN
2196   kuvasz                          0.022500  True   NaN
2207   Boston_bull                     0.008004  True   NaN
2210   mouse                           0.027271  False  NaN
2216   Chihuahua                       0.189737  True   NaN
2232   Labrador_retriever              0.148785  True   NaN
2246   schipperke                      0.104733  True   NaN
2268   cocker_spaniel                  0.081347  True   NaN
2293   miniature_poodle                0.062050  True   NaN
2306   teddy                           0.110183  False  NaN
```

	farvorite_count	dog_stage	dog_names
262	7042.0	NaN	Indie
320	10117.0	NaN	Chester
461	12586.0	NaN	Eugene
516	5699.0	NaN	Sam
799	8497.0	NaN	Roosevelt
889	6310.0	doggo	Maggie
898	3760.0	NaN	Lilli
976	2863.0	NaN	Jax
1104	3278.0	pupper	Buckley
1179	2916.0	NaN	Sid
1199	6244.0	NaN	Jennifur
1222	3142.0	NaN	Travis
1274	2523.0	NaN	NaN
1366	2305.0	NaN	Rambo
1421	17576.0	NaN	Beau
1465	2135.0	NaN	Oliviér
1481	3530.0	NaN	Sadie
1508	2493.0	NaN	NaN
1524	2060.0	NaN	Lolo
1538	2265.0	NaN	Fynn
1569	2512.0	NaN	Trooper
1593	3417.0	NaN	Crimson
1621	3679.0	NaN	Bruiser
1646	2756.0	pupper	NaN
1707	2486.0	NaN	NaN
1763	4176.0	NaN	NaN
1795	1707.0	NaN	Tassy
1812	NaN	NaN	Penny
1817	NaN	pupper	Godzilla
1842	NaN	NaN	NaN
1897	NaN	pupper	Rufio
1899	NaN	NaN	Jeb
1901	NaN	NaN	NaN
1913	NaN	NaN	Chesney
1931	NaN	NaN	Daisy
2031	NaN	NaN	NaN
2037	NaN	NaN	NaN
2064	NaN	NaN	Holly
2084	NaN	NaN	Andy
2096	NaN	NaN	Gin
2137	NaN	NaN	Ben
2177	NaN	NaN	Pancho
2190	NaN	NaN	Jaycob
2196	NaN	NaN	Bobb
2207	NaN	NaN	Timofy
2210	NaN	NaN	Kallie
2216	NaN	NaN	Spark

```
2232 NaN            NaN        NaN
2246 NaN            NaN        Tedrick
2268 NaN            NaN        Dook
2293 NaN            NaN        Pipsy
2306 NaN            NaN        NaN
```

`[52 rows x 22 columns]`

In [36]: df_all.tweet_content.replace("&","&")
         # Fixed Issue #5

Out[36]: 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, s
         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 fi
         5   Here we have a majestic great white breaching off South Africa's coast. Absolut
         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 t
         8   This is Zoey. She doesn't want to be one of the scary sharks. Just wants to be
         9   This is Cassie. She is a college pup. Studying international doggo communicatio
         10   This is Koda. He is a South Australian deckshark. Deceptively deadly. Frighteni
         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 seriou
         13   This is Ted. He does his best. Sometimes that's not enough. But it's ok. 12/10
         14   This is Stuart. He's sporting his favorite fanny pack. Secretly filled with bon
         15   This is Oliver. You're witnessing one of his many brutal attacks. Seems to be p
         16   This is Jim. He found a fren. Taught him how to sit like the good boys. 12/10 f
         17   This is Zeke. He has a new stick. Very proud of it. Would like you to throw it
         18   This is Ralphus. He's powering up. Attempting maximum borkdrive. 13/10 inspirat
         20   This is Gerald. He was just told he didn't get the job he interviewed for. A h*
         21   This is Jeffrey. He has a monopoly on the pool noodles. Currently running a 'bo
         22   I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10 paw-in
         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: em
         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 en
         27   This is Mingus. He's a wonderful father to his smol pup. Confirmed 13/10, but h
         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. G
         31   This is Waffles. His doggles are pupside down. Unsure how to fix. 13/10 someone
                                                          ...
         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
         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/uHXrPkUE
         2330   Unique dog here. Very small. Lives in container of Frosted Flakes (?). Short le
         2331   Here we have a mixed Asiago from the Galápagos Islands. Only one ear working. B

```
2332    Look at this jokester thinking seat belt laws don't apply to him. Great tongue
2333    This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall ve
2334    This is a funny dog. Weird toes. Won't come down. Loves branch. Refuses to eat
2335    This is an Albanian 3 1/2 legged  Episcopalian. Loves well-polished hardwood fl
2336    Can take selfies 11/10 https://t.co/ws2AMaNwPW
2337    Very concerned about fellow dog trapped in computer. 10/10 https://t.co/OyxApIi
2338    Not familiar with this breed. No tail (weird). Only 2 legs. Doesn't bark. Surpr
2339    Oh my. Here you are seeing an Adobe Setter giving birth to twins!!! The world i
2340    Can stand on stump for what seems like a while. Built that birdhouse? Impressiv
2341    This appears to be a Mongolian Presbyterian mix. Very tired. Tongue slip confir
2342    Here we have a well-established sunblockerspaniel. Lost his other flip-flop. 6/
2343    Let's hope this flight isn't Malaysian (lol). What a dog! Almost completely cam
2344    Here we have a northern speckled Rhododendron. Much sass. Gives 0 fucks. Good t
2345    This is the happiest dog you will ever see. Very committed owner. Nice couch. 1
2346    Here is the Rand Paul of retrievers folks! He's probably good at poker. Can dri
2347    My oh my. This is a rare blond Canadian terrier on wheels. Only $8.98. Rather d
2348    Here is a Siberian heavily armored polar bear mix. Strong owner. 10/10 I would
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. Pri
2351    Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News. Canno
2352    This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks like
2353    Here is a very happy pup. Big fan of well-maintained decks. Just look at that t
2354    This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2 dogs h
2355    Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of relax
Name: tweet_content, Length: 1994, dtype: object
```

In [37]: # Store the clean DataFrame in a CSV file
         df_all.to_csv('twitter_archive_master.csv', index=False, encoding = 'utf-8')

0.4   6. Analyzing and visualizing data

In [38]: df_all = pd.read_csv('twitter_archive_master.csv')
         df_all.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1994 entries, 0 to 1993
Data columns (total 22 columns):
tweet_id                 1994 non-null int64
tweet_date               1994 non-null object
tweet_source             1994 non-null object
tweet_content            1994 non-null object
tweet_url                1994 non-null object
rating_numerator         1994 non-null float64
rating_denominator       1994 non-null float64
tweet_picture_predicted  1994 non-null object
img_num                  1994 non-null float64
p1                       1994 non-null object
p1_conf                  1994 non-null float64
```

```
p1_dog                          1994 non-null bool
p2                              1994 non-null object
p2_conf                         1994 non-null float64
p2_dog                          1994 non-null bool
p3                              1994 non-null object
p3_conf                         1994 non-null float64
p3_dog                          1994 non-null bool
retweet_count                   1452 non-null float64
farvorite_count                 1452 non-null float64
dog_stage                       326 non-null object
dog_names                       1369 non-null object
dtypes: bool(3), float64(8), int64(1), object(10)
memory usage: 301.9+ KB
```

```python
In [39]: # Creating the dog_stage pie chart
         labels = ['Doggo', 'Floofer', 'Pupper', 'Puppo']
         colors = ['gold', 'yellowgreen', 'lightcoral', 'lightskyblue']
         explode = (0.1, 0, 0, 0)  # only "explode" the 1st slice (i.e. 'Doggo')
         plt.pie(df_all['dog_stage'].value_counts(),explode = explode, autopct='%1.1f%%', colors
         plt.title('Dog Stages distribution')
         plt.legend(labels)
         plt.tight_layout()

         # Equal aspect ratio ensures that pie is drawn as a circle
         plt.axis('equal')
         plt.show()
```


Dog Stages distribution
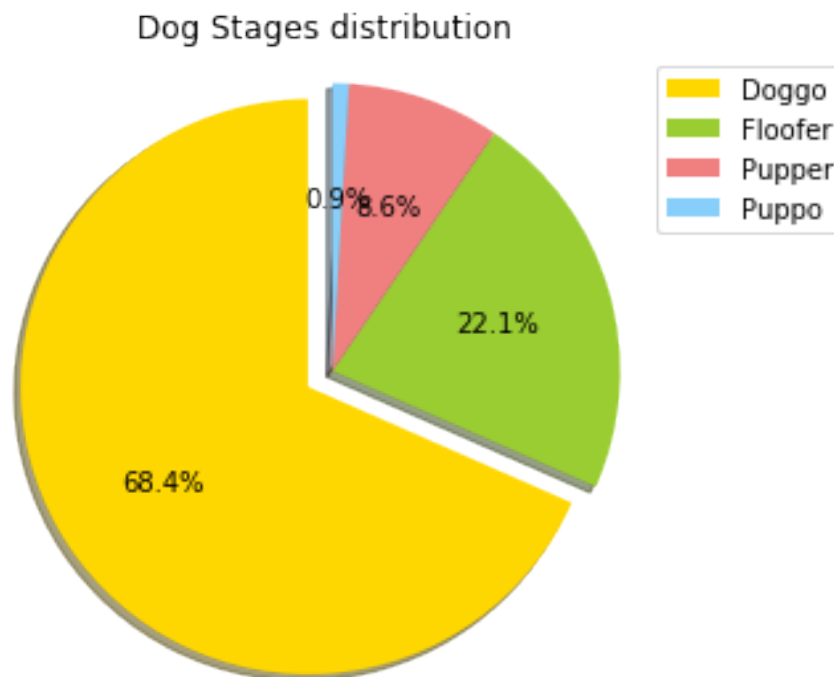
One can not deny that 'doggo' is the most popular dog state among the survey. It accounted for nearly 70% of all stage which is two times higher that of the rest's combination.

```
In [40]: #Set timestamp as an index
         df_all = df_all.set_index('tweet_date')
         #Set our range of rating to take off the oulier
         df_all.plot(y ='rating_numerator', ylim=[0,20], figsize=(10, 5),style = '.', alpha = .2
         plt.title('Rating plot over Time')
         plt.xlabel('Time')
         plt.ylabel('Rating')

Out[40]: Text(0,0.5,'Rating')
```
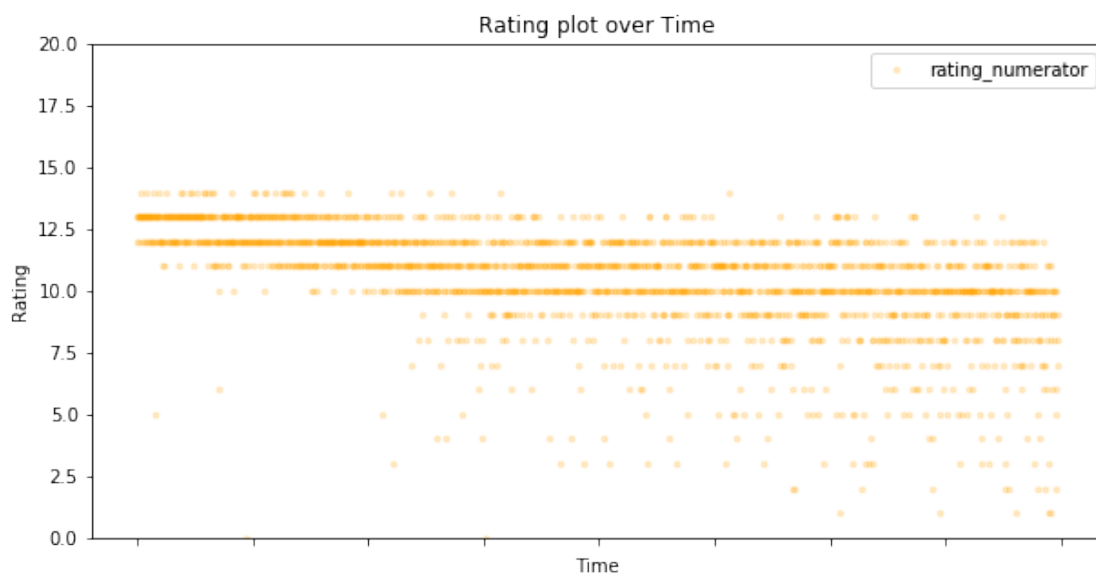


```
In [41]: df_all[df_all['rating_numerator'] <= 16]['rating_numerator'].describe()

Out[41]: count    1975.000000
         mean       10.538228
         std         2.200311
         min         0.000000
         25%        10.000000
         50%        11.000000
         75%        12.000000
         max        14.000000
         Name: rating_numerator, dtype: float64
```

More than 75% of the data has more than 12/10 as rating More than 50% of the data has more than 11/10 as rating Rating is trending down over time. More ever, the rating range seems more diversity than that of the past

```
In [42]: # Scatter plot of favorites and retweets count.
         df_all.plot(kind = 'scatter', x = 'farvorite_count', y = 'retweet_count', s=50, figsize
         plt.xlabel('Favorites Count')
         plt.ylabel('Retweets Count')
         plt.title('Scatter Plot of Favorites and Retweets count')

Out[42]: Text(0.5,1,'Scatter Plot of Favorites and Retweets count')
```
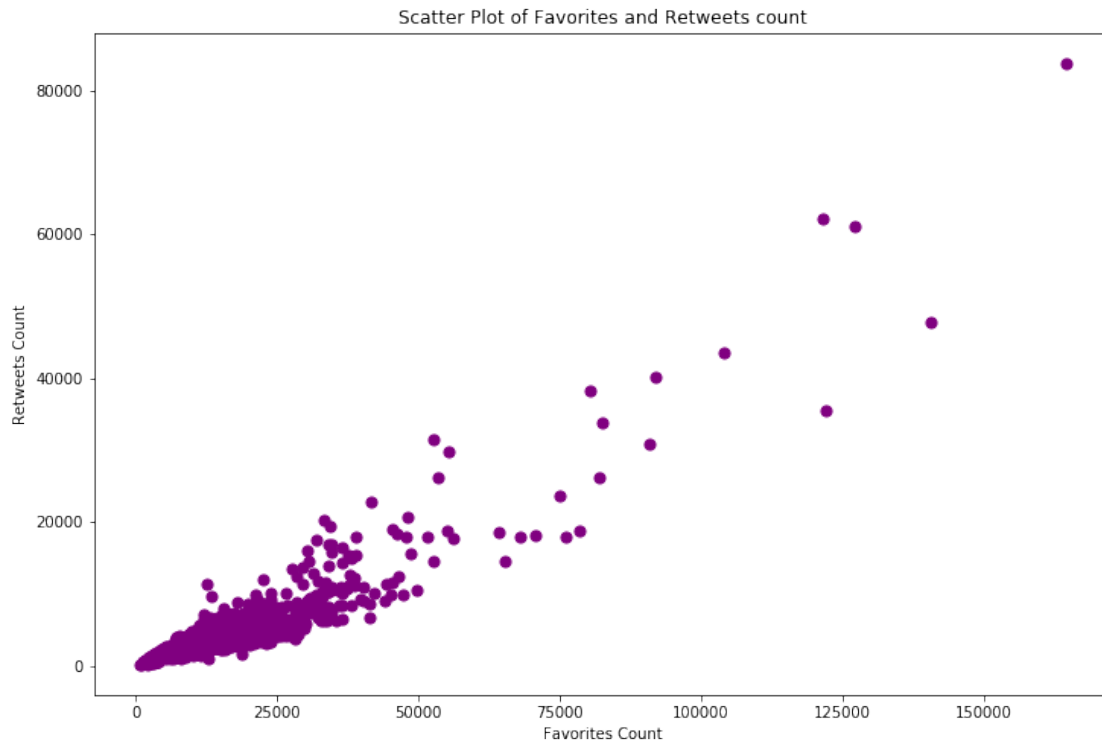

Not supprisingly, a correlation map illustrates that if the number of the retweet is high then the number of farvorite will be high as well.

```
In [43]: df_all['tweet_source'].value_counts().plot(kind = 'barh')
         plt.xlabel('Count')
         plt.title('Horizontal Bar plot of Tweet Sources')

Out[43]: Text(0.5,1,'Horizontal Bar plot of Tweet Sources')
```

Horizontal Bar plot of Tweet Sources
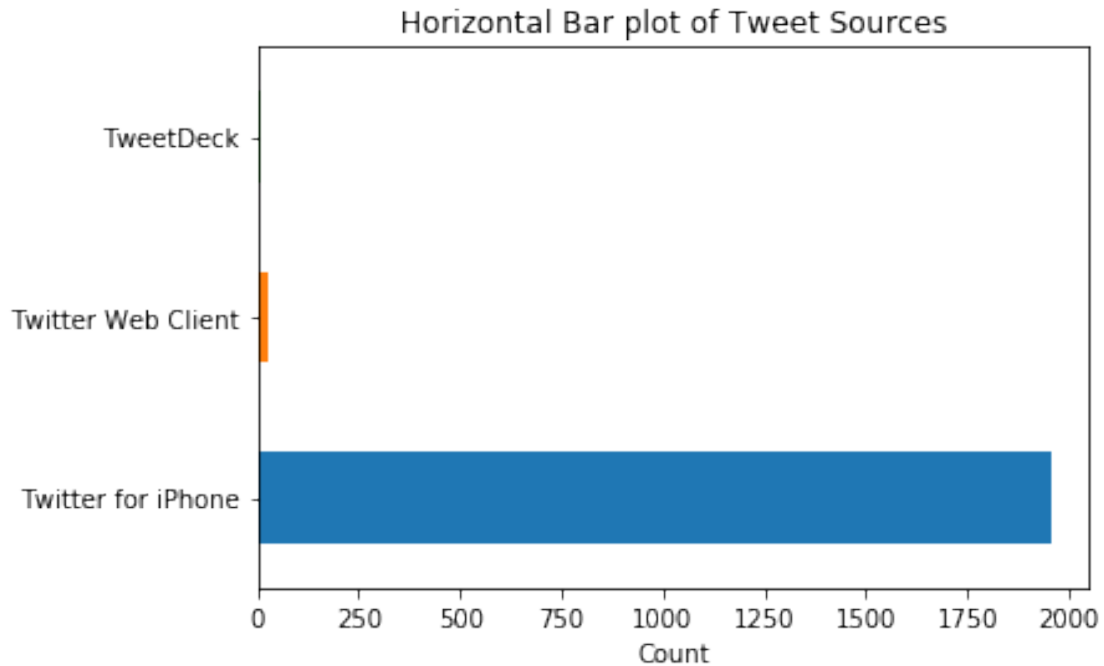
The number of tweets submitted from Iphone is ridiculously higher than that of all other source, indicating that people are tent to tweet by their Iphone instead of other means when using Twitter.

0.5 Conclusion:

The Twitter account WeRateDog is a good source to collect information regarding user's beloved dogs' stages, rating, favorite and retweets counted over time. However, we need to put effort in cleaning data retrive from Twitter API as the raw data is having a lot of problems making it difficult to read and research. If you want a specific row of data to analyze, my adivise is to validate its own and related columns data before using them for visualization