

wrangle_act

November 9, 2022

1 Project: Wrangling and Analyze Data

1.1 Data Gathering

In the cell below, gather **all** three pieces of data for this project and load them in the notebook. **Note:** the methods required to gather each data are different. 1. Directly download the WeRate-Dogs Twitter archive data (twitter_archive_enhanced.csv)

```
In [88]: import pandas as pd
import numpy as np
import requests
import os
import tweepy
from tweepy import OAuthHandler
import json
from timeit import default_timer as timer
import warnings
warnings.filterwarnings('ignore')
import seaborn as sb
import matplotlib.pyplot as plt
%matplotlib inline

In [89]: #Read the csv file into the dataframe
df_tweet= pd.read_csv('twitter-archive-enhanced.csv')

In [90]: list(df_tweet)

Out[90]: ['tweet_id',
'in_reply_to_status_id',
'in_reply_to_user_id',
'timestamp',
'source',
'text',
'retweeted_status_id',
'retweeted_status_user_id',
'retweeted_status_timestamp',
'expanded_urls',
'rating_numerator',
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'rating_denominator',
'name',
'doggo',
'floofer',
'pupper',
'puppo']

```

2. Use the Requests library to download the tweet image prediction (image_predictions.tsv)

```

In [91]: #this is the folder where the file for image_predictions.tsv will be downloaded
url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predicti
response = requests.get(url)
response

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Out[91]: <Response [200]>

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In [92]: with open('image-prediction.tsv', 'wb') as file:
file.write(response.content)

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In [93]: #To read the image predictions table into a dataframe
image = pd.read_csv('image-predictions.tsv', sep='\t')

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In [94]: os.listdir()

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Out[94]: ['image-prediction.tsv',
'twitter-archive-enhanced.csv',
'image',
'act_report.ipynb',
'tweet_json.txt',
'image-predictions.tsv',
'.ipynb_checkpoints',
'wrangle_report.ipynb',
'wrangle_act.ipynb']

```

3. Use the Tweepy library to query additional data via the Twitter API (tweet_json.txt)

```

In [9]: # Query Twitter API for each tweet in the Twitter archive and save JSON in a text file
# These are hidden to comply with Twitter's API terms and conditions
consumer_key = 'HIDDEN'
consumer_secret = 'HIDDEN'
access_token = 'HIDDEN'
access_secret = 'HIDDEN'
auth = OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_token, access_secret)

api = tweepy.API(auth, wait_on_rate_limit=True)

# Tweet IDs for which to gather additional data via Twitter's API
tweet_ids = df_tweet.tweet_id.values

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len(tweet_ids)

# Query Twitter's API for JSON data for each tweet ID in the Twitter archive
count = 0
fails_dict = {}
start = timer()
# Save each tweet's returned JSON as a new line in a .txt file
with open('tweet_json.txt', 'w') as outfile:
    # This loop will likely take 20-30 minutes to run because of Twitter's rate limit
    for tweet_id in tweet_ids:
        count += 1
        print(str(count) + ": " + str(tweet_id))
        try:
            tweet = api.get_status(tweet_id, tweet_mode='extended')
            print("Success")
            json.dump(tweet._json, outfile)
            outfile.write('\n')
        except tweepy.TweepError as e:
            print("Fail")
            fails_dict[tweet_id] = e
        pass
end = timer()
print(end - start)
print(fails_dict)

```

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1927.9922803979998
{888202515573088257: TweepError([{'code': 144, 'message': 'No status found with that ID.'}],), 8

```

```

In [10]: data = pd.DataFrame(columns=['tweet_id', 'retweet_count', 'favorite_count'])
         with open('tweet_json.txt') as f:
             for line in f:
                 status = json.loads(line)
                 tweet_id = status['id_str']
                 retweet_count = status['retweet_count']
                 favorite_count = status['favorite_count']
                 data = data.append(pd.DataFrame([[tweet_id, retweet_count, favorite_count]],
                                                  columns=['tweet_id', 'retweet_count', \
                                                         'favorite_count']))
         data = data.reset_index(drop=True)

```

Assessing dataset was done visually using jupyter notebook and other text editor e.g Excel
Programmatic assessment was done on the dataset using pandas functions.

1.2 Assessing Data

In this section, detect and document at least **eight (8) quality issues and two (2) tidiness issue**.
You must use **both** visual assessment programmatic assesement to assess the data.

Note: pay attention to the following key points when you access the data.

- You only want original ratings (no retweets) that have images. Though there are 5000+ tweets in the dataset, not all are dog ratings and some are retweets.
- Assessing and cleaning the entire dataset completely would require a lot of time, and is not necessary to practice and demonstrate your skills in data wrangling. Therefore, the requirements of this project are only to assess and clean at least 8 quality issues and at least 2 tidiness issues in this dataset.
- The fact that the rating numerators are greater than the denominators does not need to be cleaned. This [unique rating system](#) is a big part of the popularity of WeRateDogs.
- You do not need to gather the tweets beyond August 1st, 2017. You can, but note that you won't be able to gather the image predictions for these tweets since you don't have access to the algorithm used.

```
In [95]: #Display the df_tweet table
df_tweet
```

```
Out[95]:
```

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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...
15     <a href="http://twitter.com/download/iphone" r...
16     <a href="http://twitter.com/download/iphone" r...
17     <a href="http://twitter.com/download/iphone" r...
18     <a href="http://twitter.com/download/iphone" r...
19     <a href="http://twitter.com/download/iphone" r...
20     <a href="http://twitter.com/download/iphone" r...
21     <a href="http://twitter.com/download/iphone" r...
22     <a href="http://twitter.com/download/iphone" r...
23     <a href="http://twitter.com/download/iphone" r...
24     <a href="http://twitter.com/download/iphone" r...
25     <a href="http://twitter.com/download/iphone" r...
26     <a href="http://twitter.com/download/iphone" r...
27     <a href="http://twitter.com/download/iphone" r...
28     <a href="http://twitter.com/download/iphone" r...
29     <a href="http://twitter.com/download/iphone" r...
...
2326  <a href="http://twitter.com/download/iphone" r...
2327  <a href="http://twitter.com/download/iphone" r...
2328  <a href="http://twitter.com/download/iphone" r...
2329  <a href="http://twitter.com/download/iphone" r...
2330  <a href="http://twitter.com/download/iphone" r...
2331  <a href="http://twitter.com/download/iphone" r...
2332  <a href="http://twitter.com/download/iphone" r...
2333  <a href="http://twitter.com/download/iphone" r...
2334  <a href="http://twitter.com/download/iphone" r...
2335  <a href="http://twitter.com/download/iphone" r...
2336  <a href="http://twitter.com/download/iphone" r...
```

2337 <a href="http://twitter.com/download/iphone" r...
 2338 <a href="http://twitter.com/download/iphone" r...
 2339 <a href="http://twitter.com/download/iphone" r...
 2340 <a href="http://twitter.com/download/iphone" r...
 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 \
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
15	This is Oliver. You're witnessing one of his m...	NaN
16	This is Jim. He found a fren. Taught him how t...	NaN
17	This is Zeke. He has a new stick. Very proud o...	NaN
18	This is Ralphus. He's powering up. Attempting ...	NaN
19	RT @dog_rates: This is Canela. She attempted s...	8.874740e+17
20	This is Gerald. He was just told he didn't get...	NaN
21	This is Jeffrey. He has a monopoly on the pool...	NaN
22	I've yet to rate a Venezuelan Hover Wiener. Th...	NaN
23	This is Canela. She attempted some fancy porch...	NaN
24	You may not have known you needed to see this ...	NaN
25	This... is a Jubilant Antarctic House Bear. We...	NaN
26	This is Maya. She's very shy. Rarely leaves he...	NaN

27	This is Mingus. He's a wonderful father to his...	NaN
28	This is Derek. He's late for a dog meeting. 13...	NaN
29	This is Roscoe. Another pupper fallen victim t...	NaN
...
2326	This is quite the dog. Gets really excited whe...	NaN
2327	This is a southern Vesuvius bumblegruff. Can d...	NaN
2328	Oh goodness. A super rare northeast Qdoba kang...	NaN
2329	Those are sunglasses and a jean jacket. 11/10 ...	NaN
2330	Unique dog here. Very small. Lives in containe...	NaN
2331	Here we have a mixed Asiago from the Galápagos...	NaN
2332	Look at this jokester thinking seat belt laws ...	NaN
2333	This is an extremely rare horned Parthenon. No...	NaN
2334	This is a funny dog. Weird toes. Won't come do...	NaN
2335	This is an Albanian 3 1/2 legged Episcopalian...	NaN
2336	Can take selfies 11/10 https://t.co/ws2AMaWpPW	NaN
2337	Very concerned about fellow dog trapped in com...	NaN
2338	Not familiar with this breed. No tail (weird)...	NaN
2339	Oh my. Here you are seeing an Adobe Setter giv...	NaN
2340	Can stand on stump for what seems like a while...	NaN
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 \
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
5	NaN	NaN
6	NaN	NaN
7	NaN	NaN
8	NaN	NaN
9	NaN	NaN
10	NaN	NaN
11	NaN	NaN

12	NaN	NaN
13	NaN	NaN
14	NaN	NaN
15	NaN	NaN
16	NaN	NaN
17	NaN	NaN
18	NaN	NaN
19	4.196984e+09	2017-07-19 00:47:34 +0000
20	NaN	NaN
21	NaN	NaN
22	NaN	NaN
23	NaN	NaN
24	NaN	NaN
25	NaN	NaN
26	NaN	NaN
27	NaN	NaN
28	NaN	NaN
29	NaN	NaN
...
2326	NaN	NaN
2327	NaN	NaN
2328	NaN	NaN
2329	NaN	NaN
2330	NaN	NaN
2331	NaN	NaN
2332	NaN	NaN
2333	NaN	NaN
2334	NaN	NaN
2335	NaN	NaN
2336	NaN	NaN
2337	NaN	NaN
2338	NaN	NaN
2339	NaN	NaN
2340	NaN	NaN
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 \
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
15	https://twitter.com/dog_rates/status/889278841...	13
16	https://twitter.com/dog_rates/status/888917238...	12
17	https://twitter.com/dog_rates/status/888804989...	13
18	https://twitter.com/dog_rates/status/888554962...	13
19	https://twitter.com/dog_rates/status/887473957...	13
20	https://twitter.com/dog_rates/status/888078434...	12
21	https://twitter.com/dog_rates/status/887705289...	13
22	https://twitter.com/dog_rates/status/887517139...	14
23	https://twitter.com/dog_rates/status/887473957...	13
24	https://twitter.com/dog_rates/status/887343217...	13
25	https://twitter.com/dog_rates/status/887101392...	12
26	https://twitter.com/dog_rates/status/886983233...	13
27	https://www.gofundme.com/mingusneedsus,https:/...	13
28	https://twitter.com/dog_rates/status/886680336...	13
29	https://twitter.com/dog_rates/status/886366144...	12
...
2326	https://twitter.com/dog_rates/status/666411507...	2
2327	https://twitter.com/dog_rates/status/666407126...	7
2328	https://twitter.com/dog_rates/status/666396247...	9
2329	https://twitter.com/dog_rates/status/666373753...	11
2330	https://twitter.com/dog_rates/status/666362758...	6
2331	https://twitter.com/dog_rates/status/666353288...	8
2332	https://twitter.com/dog_rates/status/666345417...	10
2333	https://twitter.com/dog_rates/status/666337882...	9
2334	https://twitter.com/dog_rates/status/666293911...	3
2335	https://twitter.com/dog_rates/status/666287406...	1
2336	https://twitter.com/dog_rates/status/666273097...	11
2337	https://twitter.com/dog_rates/status/666268910...	10
2338	https://twitter.com/dog_rates/status/666104133...	1
2339	https://twitter.com/dog_rates/status/666102155...	11

2340	https://twitter.com/dog_rates/status/666099513...	8
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
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
15	10	Oliver	None	None	None	None
16	10	Jim	None	None	None	None
17	10	Zeke	None	None	None	None
18	10	Ralphus	None	None	None	None
19	10	Canela	None	None	None	None
20	10	Gerald	None	None	None	None
21	10	Jeffrey	None	None	None	None
22	10	such	None	None	None	None
23	10	Canela	None	None	None	None
24	10	None	None	None	None	None
25	10	None	None	None	None	None
26	10	Maya	None	None	None	None
27	10	Mingus	None	None	None	None
28	10	Derek	None	None	None	None
29	10	Roscoe	None	None	pupper	None

...
2326	10	quite	None	None	None	None
2327	10	a	None	None	None	None
2328	10	None	None	None	None	None
2329	10	None	None	None	None	None
2330	10	None	None	None	None	None
2331	10	None	None	None	None	None
2332	10	None	None	None	None	None
2333	10	an	None	None	None	None
2334	10	a	None	None	None	None
2335	2	an	None	None	None	None
2336	10	None	None	None	None	None
2337	10	None	None	None	None	None
2338	10	None	None	None	None	None
2339	10	None	None	None	None	None
2340	10	None	None	None	None	None
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

[2356 rows x 17 columns]

```
In [96]: #To check the dataframe info
df_tweet.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 [97]: #Display summary of the df_tweet table
df_tweet.describe()

```

```

Out[97]:
      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 [98]: df_tweet.sample(5)

```

```

Out[98]:
      tweet_id  in_reply_to_status_id  in_reply_to_user_id \
1129  729463711119904772                NaN                NaN

```


751	779056095788752897	NaN	NaN
846	766313316352462849	NaN	NaN
1097	736225175608430592	NaN	NaN
5	891087950875897856	NaN	NaN

	timestamp \
1129	2016-05-09 00:11:16 +0000
751	2016-09-22 20:33:42 +0000
846	2016-08-18 16:38:26 +0000
1097	2016-05-27 15:58:54 +0000
5	2017-07-29 00:08:17 +0000

	source \
1129	<a href="http://twitter.com/download/iphone" r...
751	<a href="http://twitter.com/download/iphone" r...
846	<a href="http://twitter.com/download/iphone" r...
1097	<a href="http://twitter.com/download/iphone" r...
5	<a href="http://twitter.com/download/iphone" r...

	text	retweeted_status_id \
1129	Meet Pupcasso. You can't afford his art. 13/10...	NaN
751	Everybody drop what you're doing and look at t...	NaN
846	This is Oscar. He has legendary eyebrows and h...	NaN
1097	We only rate dogs. Please stop sending in non-...	NaN
5	Here we have a majestic great white breaching ...	NaN

	retweeted_status_user_id	retweeted_status_timestamp \
1129	NaN	NaN
751	NaN	NaN
846	NaN	NaN
1097	NaN	NaN
5	NaN	NaN

	expanded_urls	rating_numerator \
1129	https://twitter.com/dog_rates/status/729463711...	13
751	https://twitter.com/dog_rates/status/779056095...	13
846	https://twitter.com/dog_rates/status/766313316...	12
1097	https://twitter.com/dog_rates/status/736225175...	10
5	https://twitter.com/dog_rates/status/891087950...	13

	rating_denominator	name	doggo	floofer	pupper	puppo
1129	10	Pupcasso	None	None	None	None
751	10	None	None	None	None	None
846	10	Oscar	None	None	None	None
1097	10	very	None	None	None	None
5	10	None	None	None	None	None

In [99]: *#To read the image predictions table into a dataframe*

```
image = pd.read_csv('image-predictions.tsv', sep='\t')
```

```
In [100]: #To display the image predictions tabke into a dataframe
image
```

```
Out[100]:
```

	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
10	666063827256086533	https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
11	666071193221509120	https://pbs.twimg.com/media/CT5cN_3WEAA10oZ.jpg
12	666073100786774016	https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
13	666082916733198337	https://pbs.twimg.com/media/CT5m4VGWEAAAtKc8.jpg
14	666094000022159362	https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
15	666099513787052032	https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg
16	666102155909144576	https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg
17	666104133288665088	https://pbs.twimg.com/media/CT56LSZWAAALJj2.jpg
18	666268910803644416	https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg
19	666273097616637952	https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg
20	666287406224695296	https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
21	666293911632134144	https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg
22	666337882303524864	https://pbs.twimg.com/media/CT90wFIWEAMuRje.jpg
23	666345417576210432	https://pbs.twimg.com/media/CT9Vn7PWAA_ZCM.jpg
24	666353288456101888	https://pbs.twimg.com/media/CT9cx0tUEAAhNN_.jpg
25	666362758909284353	https://pbs.twimg.com/media/CT9lXGsUcAAyUft.jpg
26	666373753744588802	https://pbs.twimg.com/media/CT9vZEYWUAA1Z05.jpg
27	666396247373291520	https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
28	666407126856765440	https://pbs.twimg.com/media/CT-NvwmW4AAAugGZ.jpg
29	666411507551481857	https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
...
2045	886366144734445568	https://pbs.twimg.com/media/DE0BTnQUwAApKEH.jpg
2046	886680336477933568	https://pbs.twimg.com/media/DE4fEDzWAAAYHMM.jpg
2047	886736880519319552	https://pbs.twimg.com/media/DE5Se8FXcAAJF4x.jpg
2048	886983233522544640	https://pbs.twimg.com/media/DE8yicJW0AAAvBJ.jpg
2049	887101392804085760	https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
2050	887343217045368832	https://pbs.twimg.com/ext_tw_video_thumb/88734...
2051	887473957103951883	https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
2052	887517139158093824	https://pbs.twimg.com/ext_tw_video_thumb/88751...
2053	887705289381826560	https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg
2054	888078434458587136	https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg
2055	888202515573088257	https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg

2056	888554962724278272	https://pbs.twimg.com/media/DFTH_0-UQAAACu20.jpg
2057	888804989199671297	https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
2058	888917238123831296	https://pbs.twimg.com/media/DFYRgsOUQAARGh0.jpg
2059	889278841981685760	https://pbs.twimg.com/ext_tw_video_thumb/88927...
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/DFrEyVuW0AA03t9.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/DF1eOmZXUAAULc.jpg
2069	891087950875897856	https://pbs.twimg.com/media/DF3HwyEwsAABqE6.jpg
2070	891327558926688256	https://pbs.twimg.com/media/DF6hr6BUMAAZgT.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	\
0	1	Welsh_springer_spaniel	0.465074	True	
1	1	redbone	0.506826	True	
2	1	German_shepherd	0.596461	True	
3	1	Rhodesian_ridgeback	0.408143	True	
4	1	miniature_pinscher	0.560311	True	
5	1	Bernese_mountain_dog	0.651137	True	
6	1	box_turtle	0.933012	False	
7	1	chow	0.692517	True	
8	1	shopping_cart	0.962465	False	
9	1	miniature_poodle	0.201493	True	
10	1	golden_retriever	0.775930	True	
11	1	Gordon_setter	0.503672	True	
12	1	Walker_hound	0.260857	True	
13	1	pug	0.489814	True	
14	1	bloodhound	0.195217	True	
15	1	Lhasa	0.582330	True	
16	1	English_setter	0.298617	True	
17	1	hen	0.965932	False	
18	1	desktop_computer	0.086502	False	
19	1	Italian_greyhound	0.176053	True	
20	1	Maltese_dog	0.857531	True	
21	1	three-toed_sloth	0.914671	False	
22	1	ox	0.416669	False	
23	1	golden_retriever	0.858744	True	
24	1	malamute	0.336874	True	
25	1	guinea_pig	0.996496	False	
26	1	soft-coated_wheaten_terrier	0.326467	True	

27	1	Chihuahua	0.978108	True
28	1	black-and-tan_coonhound	0.529139	True
29	1	coho	0.404640	False
...
2045	1	French_bulldog	0.999201	True
2046	1	convertible	0.738995	False
2047	1	kuvasz	0.309706	True
2048	2	Chihuahua	0.793469	True
2049	1	Samoyed	0.733942	True
2050	1	Mexican_hairless	0.330741	True
2051	2	Pembroke	0.809197	True
2052	1	limousine	0.130432	False
2053	1	basset	0.821664	True
2054	1	French_bulldog	0.995026	True
2055	2	Pembroke	0.809197	True
2056	3	Siberian_husky	0.700377	True
2057	1	golden_retriever	0.469760	True
2058	1	golden_retriever	0.714719	True
2059	1	whippet	0.626152	True
2060	1	golden_retriever	0.953442	True
2061	1	French_bulldog	0.991650	True
2062	1	Pembroke	0.966327	True
2063	1	French_bulldog	0.377417	True
2064	1	Samoyed	0.957979	True
2065	1	Pembroke	0.511319	True
2066	1	Irish_terrier	0.487574	True
2067	2	Pomeranian	0.566142	True
2068	1	Appenzeller	0.341703	True
2069	1	Chesapeake_Bay_retriever	0.425595	True
2070	2	basset	0.555712	True
2071	1	paper_towel	0.170278	False
2072	1	Chihuahua	0.716012	True
2073	1	Chihuahua	0.323581	True
2074	1	orange	0.097049	False

		p2	p2_conf	p2_dog	p3 \
0	collie	0.156665	True	Shetland_sheepdog	
1	miniature_pinscher	0.074192	True	Rhodesian_ridgeback	
2	malinois	0.138584	True	bloodhound	
3	redbone	0.360687	True	miniature_pinscher	
4	Rottweiler	0.243682	True	Doberman	
5	English_springer	0.263788	True	Greater_Swiss_Mountain_dog	
6	mud_turtle	0.045885	False	terrapien	
7	Tibetan_mastiff	0.058279	True	fur_coat	
8	shopping_basket	0.014594	False	golden_retriever	
9	komondor	0.192305	True	soft-coated_wheaten_terrier	
10	Tibetan_mastiff	0.093718	True	Labrador_retriever	
11	Yorkshire_terrier	0.174201	True	Pekinese	

12	English_foxhound	0.175382	True	Ibizan_hound
13	bull_mastiff	0.404722	True	French_bulldog
14	German_shepherd	0.078260	True	malinois
15	Shih-Tzu	0.166192	True	Dandie_Dinmont
16	Newfoundland	0.149842	True	borzoi
17	cock	0.033919	False	partridge
18	desk	0.085547	False	bookcase
19	toy_terrier	0.111884	True	basenji
20	toy_poodle	0.063064	True	miniature_poodle
21	otter	0.015250	False	great_grey_owl
22	Newfoundland	0.278407	True	groenendael
23	Chesapeake_Bay_retriever	0.054787	True	Labrador_retriever
24	Siberian_husky	0.147655	True	Eskimo_dog
25	skunk	0.002402	False	hamster
26	Afghan_hound	0.259551	True	briard
27	toy_terrier	0.009397	True	papillon
28	bloodhound	0.244220	True	flat-coated_retriever
29	barracouta	0.271485	False	gar
...
2045	Chihuahua	0.000361	True	Boston_bull
2046	sports_car	0.139952	False	car_wheel
2047	Great_Pyrenees	0.186136	True	Dandie_Dinmont
2048	toy_terrier	0.143528	True	can_opener
2049	Eskimo_dog	0.035029	True	Staffordshire_bullterrier
2050	sea_lion	0.275645	False	Weimaraner
2051	Rhodesian_ridgeback	0.054950	True	beagle
2052	tow_truck	0.029175	False	shopping_cart
2053	redbone	0.087582	True	Weimaraner
2054	pug	0.000932	True	bull_mastiff
2055	Rhodesian_ridgeback	0.054950	True	beagle
2056	Eskimo_dog	0.166511	True	malamute
2057	Labrador_retriever	0.184172	True	English_setter
2058	Tibetan_mastiff	0.120184	True	Labrador_retriever
2059	borzoi	0.194742	True	Saluki
2060	Labrador_retriever	0.013834	True	redbone
2061	boxer	0.002129	True	Staffordshire_bullterrier
2062	Cardigan	0.027356	True	basenji
2063	Labrador_retriever	0.151317	True	muzzle
2064	Pomeranian	0.013884	True	chow
2065	Cardigan	0.451038	True	Chihuahua
2066	Irish_setter	0.193054	True	Chesapeake_Bay_retriever
2067	Eskimo_dog	0.178406	True	Pembroke
2068	Border_collie	0.199287	True	ice_lolly
2069	Irish_terrier	0.116317	True	Indian_elephant
2070	English_springer	0.225770	True	German_short-haired_pointer
2071	Labrador_retriever	0.168086	True	spatula
2072	malamute	0.078253	True	kelpie
2073	Pekinese	0.090647	True	papillon

2074	bagel	0.085851	False	banana
------	-------	----------	-------	--------

	p3_conf	p3_dog
0	0.061428	True
1	0.072010	True
2	0.116197	True
3	0.222752	True
4	0.154629	True
5	0.016199	True
6	0.017885	False
7	0.054449	False
8	0.007959	True
9	0.082086	True
10	0.072427	True
11	0.109454	True
12	0.097471	True
13	0.048960	True
14	0.075628	True
15	0.089688	True
16	0.133649	True
17	0.000052	False
18	0.079480	False
19	0.111152	True
20	0.025581	True
21	0.013207	False
22	0.102643	True
23	0.014241	True
24	0.093412	True
25	0.000461	False
26	0.206803	True
27	0.004577	True
28	0.173810	True
29	0.189945	False
...
2045	0.000076	True
2046	0.044173	False
2047	0.086346	True
2048	0.032253	False
2049	0.029705	True
2050	0.134203	True
2051	0.038915	True
2052	0.026321	False
2053	0.026236	True
2054	0.000903	True
2055	0.038915	True
2056	0.111411	True
2057	0.073482	True
2058	0.105506	True

2059	0.027351	True
2060	0.007958	True
2061	0.001498	True
2062	0.004633	True
2063	0.082981	False
2064	0.008167	True
2065	0.029248	True
2066	0.118184	True
2067	0.076507	True
2068	0.193548	False
2069	0.076902	False
2070	0.175219	True
2071	0.040836	False
2072	0.031379	True
2073	0.068957	True
2074	0.076110	False

[2075 rows x 12 columns]

In [101]: image.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 [102]: image.describe()

```
Out[102]:
```

	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 [103]: data

```
Out[103]:
```

	tweet_id	retweet_count	favorite_count
0	892420643555336193	6959	33648
1	892177421306343426	5263	29193
2	891815181378084864	3463	21947
3	891689557279858688	7174	36702
4	891327558926688256	7707	35100
5	891087950875897856	2582	17721
6	890971913173991426	1644	10305
7	890729181411237888	15663	56540
8	890609185150312448	3599	24393
9	890240255349198849	6059	27796
10	890006608113172480	6105	26896
11	889880896479866881	4135	24436
12	889665388333682689	8291	41791
13	889638837579907072	3694	23551
14	889531135344209921	1873	13279
15	889278841981685760	4413	21962
16	888917238123831296	3739	25471
17	888804989199671297	3508	22342
18	888554962724278272	2859	17220
19	888078434458587136	2881	19079
20	887705289381826560	4512	26468
21	887517139158093824	9799	40539
22	887473957103951883	14939	59901
23	887343217045368832	8764	29426
24	887101392804085760	4965	26868
25	886983233522544640	6279	30187
26	886736880519319552	2609	10443
27	886680336477933568	3715	19633
28	886366144734445568	2609	18454
29	886267009285017600	4	105
...
2297	666411507551481857	261	370
2298	666407126856765440	30	93
2299	666396247373291520	68	147
2300	666373753744588802	73	162
2301	666362758909284353	463	647
2302	666353288456101888	56	178
2303	666345417576210432	121	242
2304	666337882303524864	79	168
2305	666293911632134144	288	425
2306	666287406224695296	55	123
2307	666273097616637952	66	151

2308	666268910803644416	38	99
2309	666104133288665088	5451	12829
2310	666102155909144576	11	66
2311	666099513787052032	53	134
2312	666094000022159362	63	142
2313	666082916733198337	37	92
2314	666073100786774016	129	273
2315	666071193221509120	50	127
2316	666063827256086533	180	395
2317	666058600524156928	47	99
2318	666057090499244032	111	247
2319	666055525042405380	196	366
2320	666051853826850816	697	1023
2321	666050758794694657	50	115
2322	666049248165822465	36	88
2323	666044226329800704	114	245
2324	666033412701032449	36	100
2325	666029285002620928	39	112
2326	666020888022790149	419	2280

[2327 rows x 3 columns]

In [104]: data.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2327 entries, 0 to 2326
Data columns (total 3 columns):
tweet_id      2327 non-null object
retweet_count  2327 non-null object
favorite_count 2327 non-null object
dtypes: object(3)
memory usage: 54.6+ KB
```

In [105]: data.sample(5)

```
Out[105]:
```

	tweet_id	retweet_count	favorite_count
75	878057613040115712	5703	36963
551	801538201127157760	1945	7782
1320	704347321748819968	312	1442
610	794332329137291264	2520	9082
2141	669351434509529089	153	377

```
In [ ]: #number of 'none' dog names
(df_tweet.name == 'None').sum()
```

```
In [106]: #Check for duplicate column name
all_columns = pd.Series(list(df_tweet) + list(image) + list(data))
all_columns[all_columns.duplicated()]
```

```
Out[106]: 17    tweet_id
          29    tweet_id
          dtype: object
```

```
In [ ]:
```

Enhanced Twitter Archive

1.2.1 Quality issues

Enhanced Twitter Archive table :

- 1.The tweet_id columns dtype is int instead of str.
- 2.The timestamps dtype in object instead of datetime .
- 3.There is 181 retweeted_status_id(retweet) that needs to be removed to keep only original tweet.
- 4.There is 78 in_reply_to_user_id(reply) that needs to be removed.
- 5.The rating denominator is not 10 for some dogs.
- 6.Remove the HTML code from the source column.
- 7.The Image table: tweet_id column datatype object needs to be changed to str.
- 8.Data table:tweet_id column datatype object needs to be changed to str.
- 9.Data table : Count columns have object type instead of integer type.

1.2.2 Tidiness issues

1. df_tweet : The dog stages is not in one column.
2. Merge the 3 datasets.

1.3 Cleaning Data

In this section, clean **all** of the issues you documented while assessing.

Note: Make a copy of the original data before cleaning. Cleaning includes merging individual pieces of data according to the rules of [tidy data](#). The result should be a high-quality and tidy master pandas DataFrame (or DataFrames, if appropriate).

```
In [107]: # Make copies of original pieces of data
          df_tweet_clean = df_tweet.copy()
          image_clean = image.copy()
          data_clean = data.copy()
```

1.3.1 Issue #1:

Define: Convert the tweet_id datatype from int to str

Code

```
In [108]: #Change the str datatype using apply(str)
          df_tweet_clean['tweet_id'] = df_tweet_clean['tweet_id'].apply(str)
```

```
In [109]: #Test
          df_tweet_clean.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
tweet_id                2356 non-null object
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(2), object(11)
memory usage: 313.0+ KB

```

Test

1.3.2 Issue #2:

Define Convert the timestamps datatype to datetime datatype

Code

```

In [110]: #Convert the timestamp dtypes from int to datetime
          df_tweet_clean['timestamp'] = pd.to_datetime(df_tweet_clean['timestamp'])

```

Test

```

In [111]: df_tweet_clean.info()

```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
tweet_id                2356 non-null object
in_reply_to_status_id   78 non-null float64
in_reply_to_user_id     78 non-null float64
timestamp               2356 non-null datetime64[ns]
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: datetime64[ns](1), float64(4), int64(2), object(10)
memory usage: 313.0+ KB

```

2 Issue 3

Define Remove the retweeted_status_id

```

In [112]: #####Code
          df_tweet_clean= df_tweet_clean[df_tweet_clean['retweeted_status_id'].isnull()]
          df_tweet_clean.drop(columns = ['retweeted_status_id', 'retweeted_status_user_id', 'ret

In [ ]: df_tweet_clean = df_tweet_clean[df_tweet_clean['p1_dog'] == True]

```

3 Test

```

In [113]: df_tweet_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 14 columns):
tweet_id      2175 non-null object
in_reply_to_status_id  78 non-null float64
in_reply_to_user_id    78 non-null float64
timestamp      2175 non-null datetime64[ns]
source         2175 non-null object
text           2175 non-null object
expanded_urls   2117 non-null object
rating_numerator  2175 non-null int64
rating_denominator 2175 non-null int64
name           2175 non-null object
doggo          2175 non-null object
floofer        2175 non-null object
pupper         2175 non-null object
puppo          2175 non-null object
dtypes: datetime64[ns](1), float64(2), int64(2), object(9)

```

memory usage: 254.9+ KB

4 Issue 4

5 Define

Remove the in_reply_status_id

```
In [114]: #####Code
```

```
df_tweet_clean = df_tweet_clean[df_tweet_clean['in_reply_to_status_id'].isnull()]
df_tweet_clean.drop(columns = ['in_reply_to_user_id', 'in_reply_to_status_id'], inplace=True)
```

```
In [115]: #Test
```

```
df_tweet_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
Int64Index: 2097 entries, 0 to 2355
```

```
Data columns (total 12 columns):
```

```
tweet_id          2097 non-null object
timestamp         2097 non-null datetime64[ns]
source            2097 non-null object
text              2097 non-null object
expanded_urls     2094 non-null object
rating_numerator  2097 non-null int64
rating_denominator 2097 non-null int64
name              2097 non-null object
doggo             2097 non-null object
floofer           2097 non-null object
pupper           2097 non-null object
puppo             2097 non-null object
```

```
dtypes: datetime64[ns](1), int64(2), object(9)
```

```
memory usage: 213.0+ KB
```

6 Issue 5

7 Define

Remove the denominator when its not equal to 10

```
In [116]: #Code
```

```
x = df_tweet_clean[df_tweet_clean['rating_denominator']!=10].index
df_tweet_clean.loc['x', 'rating_denominator']=10
# keep rows where numerator is between 1-14 .
df_tweet_clean = df_tweet_clean[(df_tweet_clean.rating_numerator > 0) & (df_tweet_clean.rating_denominator < 15)]
```

```
In [117]: #Code
          # keep rows where numerator is between 1-14 and the denominator is 10
          df_tweet_clean = df_tweet_clean[(df_tweet_clean.rating_numerator > 0) & (df_tweet_clean.rating_denominator > 0)]
```

Test

```
In [118]: #Test
          print(df_tweet_clean.rating_numerator.value_counts())
          print(df_tweet_clean.rating_denominator.value_counts())
```

```
12.0    486
10.0    436
11.0    413
13.0    287
9.0     153
8.0     98
7.0     52
14.0     38
5.0     34
6.0     32
3.0     19
4.0     16
2.0      9
1.0      5
```

```
Name: rating_numerator, dtype: int64
```

```
10.0    2074
11.0      2
2.0      1
20.0     1
```

```
Name: rating_denominator, dtype: int64
```

8 Issue 6

Define ##Remove the HTML from the source column using a loop.

```
In [119]: # define function to strip source link
          def strip_url(x):
              return x.split('>', 1)[-1][:4]
          # apply to source column
          df_tweet_clean['source'] = df_tweet_clean['source'].apply(strip_url)
```

```
In [120]: #Test
          df_tweet_clean['source'].value_counts()
```

```
Out[120]: Twitter for iPhone    1946
          Vine - Make a Scene    91
          Twitter Web Client    31
          TweetDeck             10
          Name: source, dtype: int64
```

9 Define

10 Remove the p2 and p3 columns

```
In [121]: #Code
          # Remove p2 and p3 related columns from `image` table.
          image_clean = image_clean.drop(columns = ['p2', 'p2_conf', 'p2_dog', 'p3', 'p3_conf'],
```

```
In [126]: #Test
          image_clean.head(5)
```

```
Out[126]:
```

	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	

	img_num	p1	p1_conf	p1_dog
0	1	Welsh_springer_spaniel	0.465074	True
1	1	redbone	0.506826	True
2	1	German_shepherd	0.596461	True
3	1	Rhodesian_ridgeback	0.408143	True
4	1	miniature_pinscher	0.560311	True

```
In [123]: #Test
          image_clean.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2075 entries, 0 to 2074
Data columns (total 6 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
dtypes: bool(1), float64(1), int64(2), object(2)
memory usage: 83.2+ KB
```

11 Define Remove the non-dog predictions

```
In [124]: # Remove non-dog predictions rows from image table.
          image_clean = image_clean[image_clean['p1_dog'] == True]
```

```
In [176]: #Test
          df_final[df_final.p1_dog == False]

Out[176]: Empty DataFrame
Columns: [tweet_id, timestamp, source, text, expanded_urls, name, doggo, floofer, puppy]
Index: []
```

Issue 9

12 Define

Create the new rating using rating_numerator and rating_denominator.

```
In [ ]: #Code
        ##Create a new column 'rating' using rating_numerator and rating_denominator, and drop r
        df_tweet_clean['rating'] = df_tweet_clean['rating_numerator'] / df_tweet_clean['rating_d
        df_tweet_clean.drop(columns = ['rating_numerator', 'rating_denominator'], inplace = True

In [129]: #Test
          df_tweet_clean['rating'].value_counts()

Out[129]: 1.200000    486
          1.000000    436
          1.100000    413
          1.300000    287
          0.900000    152
          0.800000     98
          0.700000     51
          1.400000     38
          0.500000     35
          0.600000     32
          0.300000     19
          0.400000     15
          0.200000     10
          0.100000      4
          0.818182      1
          0.636364      1
          Name: rating, dtype: int64
```

13 Issue 10

Define Remove the image table dtypes to str

```
In [130]: #Code
          # Change tweet_id dtype to string in image dataset.
          image_clean['tweet_id'] = image_clean['tweet_id'].apply(str)

In [131]: #Test
          image_clean.info()
```



```

<class 'pandas.core.frame.DataFrame'>
Int64Index: 1532 entries, 0 to 2073
Data columns (total 6 columns):
tweet_id      1532 non-null object
jpg_url       1532 non-null object
img_num       1532 non-null int64
p1            1532 non-null object
p1_conf       1532 non-null float64
p1_dog        1532 non-null bool
dtypes: bool(1), float64(1), int64(1), object(3)
memory usage: 73.3+ KB

```

```
In [ ]: #Issue 10
```

14 Define

Change tweet_id dtype to string in data dataset.

```

In [132]: #Code
          # Change tweet_id dtype to string in data dataset.
          data_clean['tweet_id'] = data_clean['tweet_id'].apply(str)

```

```

In [133]: #Test
          data_clean.info()

```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2327 entries, 0 to 2326
Data columns (total 3 columns):
tweet_id      2327 non-null object
retweet_count  2327 non-null object
favorite_count 2327 non-null object
dtypes: object(3)
memory usage: 54.6+ KB

```

Define Convert the columns dtypes in the data table

```

In [134]: # Convert `data` table count columns' dtype from str to integer.
          #Define Change columns from str to int dtypes in retweet_count, favorite_count columns
          for col in ['retweet_count', 'favorite_count']:
              data[col] = data[col].fillna(0)
              data[col] = data[col].apply(int)

```

```

In [136]: #Test
          data.info()

```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2327 entries, 0 to 2326

```

```
Data columns (total 3 columns):
tweet_id          2327 non-null object
retweet_count     2327 non-null int64
favorite_count    2327 non-null int64
dtypes: int64(2), object(1)
memory usage: 54.6+ KB
```

Tidiness

In []: Issue 11

Define #Replace none value with empty("")

```
In [137]: #Code to replace None value
for col in ['doggo', 'floofer', 'pupper', 'puppo']:
    df_tweet_clean[col].replace('None', '', inplace = True)

df_tweet_clean['stage'] = df_tweet_clean.doggo + df_tweet_clean.floofer + df_tweet_clean.pupper

df_tweet_clean['stage'].value_counts()
```

```
Out[137]:
1743
pupper      220
doggo        72
puppo        23
floofer        9
doggopupper    9
doggopuppo     1
doggofloofer    1
Name: stage, dtype: int64
```

```
In [138]: # Deal with multiple stages in a tweet.
df_tweet_clean.loc[df_tweet_clean.stage == 'doggopupper', 'stage'] = 'doggo, pupper'
df_tweet_clean.loc[df_tweet_clean.stage == 'doggopuppo', 'stage'] = 'doggo, puppo'
df_tweet_clean.loc[df_tweet_clean.stage == 'doggofloofer', 'stage'] = 'doggo, floofer'

# Change missing value to NaN
df_tweet_clean.loc[df_tweet_clean.stage == '', 'stage'] = np.nan
```

```
In [139]: #Test
df_tweet_clean.head(5)
```

```
Out[139]:
   tweet_id  timestamp  source \
0  892420643555336193  2017-08-01 16:23:56  Twitter for iPhone
1  892177421306343426  2017-08-01 00:17:27  Twitter for iPhone
2  891815181378084864  2017-07-31 00:18:03  Twitter for iPhone
3  891689557279858688  2017-07-30 15:58:51  Twitter for iPhone
4  891327558926688256  2017-07-29 16:00:24  Twitter for iPhone
```

	text \	expanded_urls	name doggo floofer \
0	This is Phineas. He's a mystical boy. Only eve...		Phineas
1	This is Tilly. She's just checking pup on you...		Tilly
2	This is Archie. He is a rare Norwegian Pouncin...		Archie
3	This is Darla. She commenced a snooze mid meal...		Darla
4	This is Franklin. He would like you to stop ca...		Franklin

	pupper puppo	rating	stage
0		1.3	NaN
1		1.3	NaN
2		1.2	NaN
3		1.3	NaN
4		1.2	NaN

In [140]: df_tweet_clean

Out[140]:

	tweet_id	timestamp	source \
0	892420643555336193	2017-08-01 16:23:56	Twitter for iPhone
1	892177421306343426	2017-08-01 00:17:27	Twitter for iPhone
2	891815181378084864	2017-07-31 00:18:03	Twitter for iPhone
3	891689557279858688	2017-07-30 15:58:51	Twitter for iPhone
4	891327558926688256	2017-07-29 16:00:24	Twitter for iPhone
5	891087950875897856	2017-07-29 00:08:17	Twitter for iPhone
6	890971913173991426	2017-07-28 16:27:12	Twitter for iPhone
7	890729181411237888	2017-07-28 00:22:40	Twitter for iPhone
8	890609185150312448	2017-07-27 16:25:51	Twitter for iPhone
9	890240255349198849	2017-07-26 15:59:51	Twitter for iPhone
10	890006608113172480	2017-07-26 00:31:25	Twitter for iPhone
11	889880896479866881	2017-07-25 16:11:53	Twitter for iPhone
12	889665388333682689	2017-07-25 01:55:32	Twitter for iPhone
13	889638837579907072	2017-07-25 00:10:02	Twitter for iPhone
14	889531135344209921	2017-07-24 17:02:04	Twitter for iPhone
15	889278841981685760	2017-07-24 00:19:32	Twitter for iPhone
16	888917238123831296	2017-07-23 00:22:39	Twitter for iPhone
17	888804989199671297	2017-07-22 16:56:37	Twitter for iPhone
18	888554962724278272	2017-07-22 00:23:06	Twitter for iPhone
20	888078434458587136	2017-07-20 16:49:33	Twitter for iPhone
21	887705289381826560	2017-07-19 16:06:48	Twitter for iPhone
22	887517139158093824	2017-07-19 03:39:09	Twitter for iPhone
23	887473957103951883	2017-07-19 00:47:34	Twitter for iPhone

24	887343217045368832	2017-07-18	16:08:03	Twitter for iPhone
25	887101392804085760	2017-07-18	00:07:08	Twitter for iPhone
26	886983233522544640	2017-07-17	16:17:36	Twitter for iPhone
27	886736880519319552	2017-07-16	23:58:41	Twitter for iPhone
28	886680336477933568	2017-07-16	20:14:00	Twitter for iPhone
29	886366144734445568	2017-07-15	23:25:31	Twitter for iPhone
31	886258384151887873	2017-07-15	16:17:19	Twitter for iPhone
...
2326	666411507551481857	2015-11-17	00:24:19	Twitter for iPhone
2327	666407126856765440	2015-11-17	00:06:54	Twitter for iPhone
2328	666396247373291520	2015-11-16	23:23:41	Twitter for iPhone
2329	666373753744588802	2015-11-16	21:54:18	Twitter for iPhone
2330	666362758909284353	2015-11-16	21:10:36	Twitter for iPhone
2331	666353288456101888	2015-11-16	20:32:58	Twitter for iPhone
2332	666345417576210432	2015-11-16	20:01:42	Twitter for iPhone
2333	666337882303524864	2015-11-16	19:31:45	Twitter for iPhone
2334	666293911632134144	2015-11-16	16:37:02	Twitter for iPhone
2335	666287406224695296	2015-11-16	16:11:11	Twitter for iPhone
2336	666273097616637952	2015-11-16	15:14:19	Twitter for iPhone
2337	666268910803644416	2015-11-16	14:57:41	Twitter for iPhone
2338	666104133288665088	2015-11-16	04:02:55	Twitter for iPhone
2339	666102155909144576	2015-11-16	03:55:04	Twitter for iPhone
2340	666099513787052032	2015-11-16	03:44:34	Twitter for iPhone
2341	666094000022159362	2015-11-16	03:22:39	Twitter for iPhone
2342	666082916733198337	2015-11-16	02:38:37	Twitter for iPhone
2343	666073100786774016	2015-11-16	01:59:36	Twitter for iPhone
2344	666071193221509120	2015-11-16	01:52:02	Twitter for iPhone
2345	666063827256086533	2015-11-16	01:22:45	Twitter for iPhone
2346	666058600524156928	2015-11-16	01:01:59	Twitter for iPhone
2347	666057090499244032	2015-11-16	00:55:59	Twitter for iPhone
2348	666055525042405380	2015-11-16	00:49:46	Twitter for iPhone
2349	666051853826850816	2015-11-16	00:35:11	Twitter for iPhone
2350	666050758794694657	2015-11-16	00:30:50	Twitter for iPhone
2351	666049248165822465	2015-11-16	00:24:50	Twitter for iPhone
2352	666044226329800704	2015-11-16	00:04:52	Twitter for iPhone
2353	666033412701032449	2015-11-15	23:21:54	Twitter for iPhone
2354	666029285002620928	2015-11-15	23:05:30	Twitter for iPhone
2355	666020888022790149	2015-11-15	22:32:08	Twitter for iPhone

text \

0	This is Phineas. He's a mystical boy. Only eve...
1	This is Tilly. She's just checking pup on you...
2	This is Archie. He is a rare Norwegian Pouncin...
3	This is Darla. She commenced a snooze mid meal...
4	This is Franklin. He would like you to stop ca...
5	Here we have a majestic great white breaching ...
6	Meet Jax. He enjoys ice cream so much he gets ...
7	When you watch your owner call another dog a g...

8 This is Zoey. She doesn't want to be one of th...
 9 This is Cassie. She is a college pup. Studying...
 10 This is Koda. He is a South Australian decksha...
 11 This is Bruno. He is a service shark. Only get...
 12 Here's a puppo that seems to be on the fence a...
 13 This is Ted. He does his best. Sometimes that'...
 14 This is Stuart. He's sporting his favorite fan...
 15 This is Oliver. You're witnessing one of his m...
 16 This is Jim. He found a fren. Taught him how t...
 17 This is Zeke. He has a new stick. Very proud o...
 18 This is Ralphus. He's powering up. Attempting ...
 20 This is Gerald. He was just told he didn't get...
 21 This is Jeffrey. He has a monopoly on the pool...
 22 I've yet to rate a Venezuelan Hover Wiener. Th...
 23 This is Canela. She attempted some fancy porch...
 24 You may not have known you needed to see this ...
 25 This... is a Jubilant Antarctic House Bear. We...
 26 This is Maya. She's very shy. Rarely leaves he...
 27 This is Mingus. He's a wonderful father to his...
 28 This is Derek. He's late for a dog meeting. 13...
 29 This is Roscoe. Another pupper fallen victim t...
 31 This is Waffles. His doggles are pupside down...
 ...
 2326 This is quite the dog. Gets really excited whe...
 2327 This is a southern Vesuvius bumblegruff. Can d...
 2328 Oh goodness. A super rare northeast Qdoba kang...
 2329 Those are sunglasses and a jean jacket. 11/10 ...
 2330 Unique dog here. Very small. Lives in containe...
 2331 Here we have a mixed Asiago from the Galápagos...
 2332 Look at this jokester thinking seat belt laws ...
 2333 This is an extremely rare horned Parthenon. No...
 2334 This is a funny dog. Weird toes. Won't come do...
 2335 This is an Albanian 3 1/2 legged Episcopalian...
 2336 Can take selfies 11/10 <https://t.co/ws2AMaNwPW>
 2337 Very concerned about fellow dog trapped in com...
 2338 Not familiar with this breed. No tail (weird)...
 2339 Oh my. Here you are seeing an Adobe Setter giv...
 2340 Can stand on stump for what seems like a while...
 2341 This appears to be a Mongolian Presbyterian mi...
 2342 Here we have a well-established sunblockerspan...
 2343 Let's hope this flight isn't Malaysian (lol). ...
 2344 Here we have a northern speckled Rhododendron...
 2345 This is the happiest dog you will ever see. Ve...
 2346 Here is the Rand Paul of retrievers folks! He'...
 2347 My oh my. This is a rare blond Canadian terrie...
 2348 Here is a Siberian heavily armored polar bear ...
 2349 This is an odd dog. Hard on the outside but lo...
 2350 This is a truly beautiful English Wilson Staff...

2351 Here we have a 1949 1st generation vulpix. Enj...
 2352 This is a purebred Piers Morgan. Loves to Netf...
 2353 Here is a very happy pup. Big fan of well-main...
 2354 This is a western brown Mitsubishi terrier. Up...
 2355 Here we have a Japanese Irish Setter. Lost eye...

	expanded_urls	name	doggo \
0	https://twitter.com/dog_rates/status/892420643...	Phineas	
1	https://twitter.com/dog_rates/status/892177421...	Tilly	
2	https://twitter.com/dog_rates/status/891815181...	Archie	
3	https://twitter.com/dog_rates/status/891689557...	Darla	
4	https://twitter.com/dog_rates/status/891327558...	Franklin	
5	https://twitter.com/dog_rates/status/891087950...	None	
6	https://gofundme.com/ydvmve-surgery-for-jax,ht...	Jax	
7	https://twitter.com/dog_rates/status/890729181...	None	
8	https://twitter.com/dog_rates/status/890609185...	Zoey	
9	https://twitter.com/dog_rates/status/890240255...	Cassie	doggo
10	https://twitter.com/dog_rates/status/890006608...	Koda	
11	https://twitter.com/dog_rates/status/889880896...	Bruno	
12	https://twitter.com/dog_rates/status/889665388...	None	
13	https://twitter.com/dog_rates/status/889638837...	Ted	
14	https://twitter.com/dog_rates/status/889531135...	Stuart	
15	https://twitter.com/dog_rates/status/889278841...	Oliver	
16	https://twitter.com/dog_rates/status/888917238...	Jim	
17	https://twitter.com/dog_rates/status/888804989...	Zeke	
18	https://twitter.com/dog_rates/status/888554962...	Ralphus	
20	https://twitter.com/dog_rates/status/888078434...	Gerald	
21	https://twitter.com/dog_rates/status/887705289...	Jeffrey	
22	https://twitter.com/dog_rates/status/887517139...	such	
23	https://twitter.com/dog_rates/status/887473957...	Canela	
24	https://twitter.com/dog_rates/status/887343217...	None	
25	https://twitter.com/dog_rates/status/887101392...	None	
26	https://twitter.com/dog_rates/status/886983233...	Maya	
27	https://www.gofundme.com/mingusneedsus,https:/...	Mingus	
28	https://twitter.com/dog_rates/status/886680336...	Derek	
29	https://twitter.com/dog_rates/status/886366144...	Roscoe	
31	https://twitter.com/dog_rates/status/886258384...	Waffles	
...
2326	https://twitter.com/dog_rates/status/666411507...	quite	
2327	https://twitter.com/dog_rates/status/666407126...	a	
2328	https://twitter.com/dog_rates/status/666396247...	None	
2329	https://twitter.com/dog_rates/status/666373753...	None	
2330	https://twitter.com/dog_rates/status/666362758...	None	
2331	https://twitter.com/dog_rates/status/666353288...	None	
2332	https://twitter.com/dog_rates/status/666345417...	None	
2333	https://twitter.com/dog_rates/status/666337882...	an	
2334	https://twitter.com/dog_rates/status/666293911...	a	
2335	https://twitter.com/dog_rates/status/666287406...	an	

2336	https://twitter.com/dog_rates/status/666273097...	None
2337	https://twitter.com/dog_rates/status/666268910...	None
2338	https://twitter.com/dog_rates/status/666104133...	None
2339	https://twitter.com/dog_rates/status/666102155...	None
2340	https://twitter.com/dog_rates/status/666099513...	None
2341	https://twitter.com/dog_rates/status/666094000...	None
2342	https://twitter.com/dog_rates/status/666082916...	None
2343	https://twitter.com/dog_rates/status/666073100...	None
2344	https://twitter.com/dog_rates/status/666071193...	None
2345	https://twitter.com/dog_rates/status/666063827...	the
2346	https://twitter.com/dog_rates/status/666058600...	the
2347	https://twitter.com/dog_rates/status/666057090...	a
2348	https://twitter.com/dog_rates/status/666055525...	a
2349	https://twitter.com/dog_rates/status/666051853...	an
2350	https://twitter.com/dog_rates/status/666050758...	a
2351	https://twitter.com/dog_rates/status/666049248...	None
2352	https://twitter.com/dog_rates/status/666044226...	a
2353	https://twitter.com/dog_rates/status/666033412...	a
2354	https://twitter.com/dog_rates/status/666029285...	a
2355	https://twitter.com/dog_rates/status/666020888...	None

	floofer	pupper	puppo	rating	stage
0				1.3	NaN
1				1.3	NaN
2				1.2	NaN
3				1.3	NaN
4				1.2	NaN
5				1.3	NaN
6				1.3	NaN
7				1.3	NaN
8				1.3	NaN
9				1.4	doggo
10				1.3	NaN
11				1.3	NaN
12			puppo	1.3	puppo
13				1.2	NaN
14			puppo	1.3	puppo
15				1.3	NaN
16				1.2	NaN
17				1.3	NaN
18				1.3	NaN
20				1.2	NaN
21				1.3	NaN
22				1.4	NaN
23				1.3	NaN
24				1.3	NaN
25				1.2	NaN
26				1.3	NaN

27		1.3	NaN
28		1.3	NaN
29	pupper	1.2	pupper
31		1.3	NaN
...
2326		0.2	NaN
2327		0.7	NaN
2328		0.9	NaN
2329		1.1	NaN
2330		0.6	NaN
2331		0.8	NaN
2332		1.0	NaN
2333		0.9	NaN
2334		0.3	NaN
2335		0.5	NaN
2336		1.1	NaN
2337		1.0	NaN
2338		0.1	NaN
2339		1.1	NaN
2340		0.8	NaN
2341		0.9	NaN
2342		0.6	NaN
2343		1.0	NaN
2344		0.9	NaN
2345		1.0	NaN
2346		0.8	NaN
2347		0.9	NaN
2348		1.0	NaN
2349		0.2	NaN
2350		1.0	NaN
2351		0.5	NaN
2352		0.6	NaN
2353		0.9	NaN
2354		0.7	NaN
2355		0.8	NaN

[2078 rows x 12 columns]

```
In [141]: df_tweet_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 2078 entries, 0 to 2355
Data columns (total 12 columns):
tweet_id      2078 non-null object
timestamp     2078 non-null datetime64[ns]
source        2078 non-null object
text          2078 non-null object
expanded_urls  2075 non-null object
```



```

name                2078 non-null object
doggo               2078 non-null object
floofer            2078 non-null object
pupper            2078 non-null object
puppo             2078 non-null object
rating            2078 non-null float64
stage              335 non-null object
dtypes: datetime64[ns](1), float64(1), object(10)
memory usage: 291.0+ KB

```

15 Define

Create one column for the dog stages.

Issue 12

Define Merge the 3 tables to 1 final table

```

In [147]: #Code
          # Merge 3 table.
          df_final = df_tweet_clean.merge(image_clean, how = 'left', on = 'tweet_id')
          df_final = df_final.merge(data_clean, how = 'left', on = 'tweet_id')

```

In [148]: df_final

```

Out[148]:
          tweet_id      timestamp      source \
0      892420643555336193  2017-08-01 16:23:56  Twitter for iPhone
1      892177421306343426  2017-08-01 00:17:27  Twitter for iPhone
2      891815181378084864  2017-07-31 00:18:03  Twitter for iPhone
3      891689557279858688  2017-07-30 15:58:51  Twitter for iPhone
4      891327558926688256  2017-07-29 16:00:24  Twitter for iPhone
5      891087950875897856  2017-07-29 00:08:17  Twitter for iPhone
6      890971913173991426  2017-07-28 16:27:12  Twitter for iPhone
7      890729181411237888  2017-07-28 00:22:40  Twitter for iPhone
8      890609185150312448  2017-07-27 16:25:51  Twitter for iPhone
9      890240255349198849  2017-07-26 15:59:51  Twitter for iPhone
10     890006608113172480  2017-07-26 00:31:25  Twitter for iPhone
11     889880896479866881  2017-07-25 16:11:53  Twitter for iPhone
12     889665388333682689  2017-07-25 01:55:32  Twitter for iPhone
13     889638837579907072  2017-07-25 00:10:02  Twitter for iPhone
14     889531135344209921  2017-07-24 17:02:04  Twitter for iPhone
15     889278841981685760  2017-07-24 00:19:32  Twitter for iPhone
16     888917238123831296  2017-07-23 00:22:39  Twitter for iPhone
17     888804989199671297  2017-07-22 16:56:37  Twitter for iPhone
18     888554962724278272  2017-07-22 00:23:06  Twitter for iPhone
19     888078434458587136  2017-07-20 16:49:33  Twitter for iPhone
20     887705289381826560  2017-07-19 16:06:48  Twitter for iPhone
21     887517139158093824  2017-07-19 03:39:09  Twitter for iPhone
22     887473957103951883  2017-07-19 00:47:34  Twitter for iPhone

```

23	887343217045368832	2017-07-18	16:08:03	Twitter for iPhone
24	887101392804085760	2017-07-18	00:07:08	Twitter for iPhone
25	886983233522544640	2017-07-17	16:17:36	Twitter for iPhone
26	886736880519319552	2017-07-16	23:58:41	Twitter for iPhone
27	886680336477933568	2017-07-16	20:14:00	Twitter for iPhone
28	886366144734445568	2017-07-15	23:25:31	Twitter for iPhone
29	886258384151887873	2017-07-15	16:17:19	Twitter for iPhone
...
2048	666411507551481857	2015-11-17	00:24:19	Twitter for iPhone
2049	666407126856765440	2015-11-17	00:06:54	Twitter for iPhone
2050	666396247373291520	2015-11-16	23:23:41	Twitter for iPhone
2051	666373753744588802	2015-11-16	21:54:18	Twitter for iPhone
2052	666362758909284353	2015-11-16	21:10:36	Twitter for iPhone
2053	666353288456101888	2015-11-16	20:32:58	Twitter for iPhone
2054	666345417576210432	2015-11-16	20:01:42	Twitter for iPhone
2055	666337882303524864	2015-11-16	19:31:45	Twitter for iPhone
2056	666293911632134144	2015-11-16	16:37:02	Twitter for iPhone
2057	666287406224695296	2015-11-16	16:11:11	Twitter for iPhone
2058	666273097616637952	2015-11-16	15:14:19	Twitter for iPhone
2059	666268910803644416	2015-11-16	14:57:41	Twitter for iPhone
2060	666104133288665088	2015-11-16	04:02:55	Twitter for iPhone
2061	666102155909144576	2015-11-16	03:55:04	Twitter for iPhone
2062	666099513787052032	2015-11-16	03:44:34	Twitter for iPhone
2063	666094000022159362	2015-11-16	03:22:39	Twitter for iPhone
2064	666082916733198337	2015-11-16	02:38:37	Twitter for iPhone
2065	666073100786774016	2015-11-16	01:59:36	Twitter for iPhone
2066	666071193221509120	2015-11-16	01:52:02	Twitter for iPhone
2067	666063827256086533	2015-11-16	01:22:45	Twitter for iPhone
2068	666058600524156928	2015-11-16	01:01:59	Twitter for iPhone
2069	666057090499244032	2015-11-16	00:55:59	Twitter for iPhone
2070	666055525042405380	2015-11-16	00:49:46	Twitter for iPhone
2071	666051853826850816	2015-11-16	00:35:11	Twitter for iPhone
2072	666050758794694657	2015-11-16	00:30:50	Twitter for iPhone
2073	666049248165822465	2015-11-16	00:24:50	Twitter for iPhone
2074	666044226329800704	2015-11-16	00:04:52	Twitter for iPhone
2075	666033412701032449	2015-11-15	23:21:54	Twitter for iPhone
2076	666029285002620928	2015-11-15	23:05:30	Twitter for iPhone
2077	666020888022790149	2015-11-15	22:32:08	Twitter for iPhone

text \

0	This is Phineas. He's a mystical boy. Only eve...
1	This is Tilly. She's just checking pup on you...
2	This is Archie. He is a rare Norwegian Pouncin...
3	This is Darla. She commenced a snooze mid meal...
4	This is Franklin. He would like you to stop ca...
5	Here we have a majestic great white breaching ...
6	Meet Jax. He enjoys ice cream so much he gets ...
7	When you watch your owner call another dog a g...

8 This is Zoey. She doesn't want to be one of th...
 9 This is Cassie. She is a college pup. Studying...
 10 This is Koda. He is a South Australian decksha...
 11 This is Bruno. He is a service shark. Only get...
 12 Here's a puppo that seems to be on the fence a...
 13 This is Ted. He does his best. Sometimes that'...
 14 This is Stuart. He's sporting his favorite fan...
 15 This is Oliver. You're witnessing one of his m...
 16 This is Jim. He found a fren. Taught him how t...
 17 This is Zeke. He has a new stick. Very proud o...
 18 This is Ralphus. He's powering up. Attempting ...
 19 This is Gerald. He was just told he didn't get...
 20 This is Jeffrey. He has a monopoly on the pool...
 21 I've yet to rate a Venezuelan Hover Wiener. Th...
 22 This is Canela. She attempted some fancy porch...
 23 You may not have known you needed to see this ...
 24 This... is a Jubilant Antarctic House Bear. We...
 25 This is Maya. She's very shy. Rarely leaves he...
 26 This is Mingus. He's a wonderful father to his...
 27 This is Derek. He's late for a dog meeting. 13...
 28 This is Roscoe. Another pupper fallen victim t...
 29 This is Waffles. His doggles are pupside down...
 ...
 2048 This is quite the dog. Gets really excited whe...
 2049 This is a southern Vesuvius bumblegruff. Can d...
 2050 Oh goodness. A super rare northeast Qdoba kang...
 2051 Those are sunglasses and a jean jacket. 11/10 ...
 2052 Unique dog here. Very small. Lives in containe...
 2053 Here we have a mixed Asiago from the Galápagos...
 2054 Look at this jokester thinking seat belt laws ...
 2055 This is an extremely rare horned Parthenon. No...
 2056 This is a funny dog. Weird toes. Won't come do...
 2057 This is an Albanian 3 1/2 legged Episcopalian...
 2058 Can take selfies 11/10 <https://t.co/ws2AMaNwPW>
 2059 Very concerned about fellow dog trapped in com...
 2060 Not familiar with this breed. No tail (weird)...
 2061 Oh my. Here you are seeing an Adobe Setter giv...
 2062 Can stand on stump for what seems like a while...
 2063 This appears to be a Mongolian Presbyterian mi...
 2064 Here we have a well-established sunblockerspan...
 2065 Let's hope this flight isn't Malaysian (lol). ...
 2066 Here we have a northern speckled Rhododendron...
 2067 This is the happiest dog you will ever see. Ve...
 2068 Here is the Rand Paul of retrievers folks! He'...
 2069 My oh my. This is a rare blond Canadian terrie...
 2070 Here is a Siberian heavily armored polar bear ...
 2071 This is an odd dog. Hard on the outside but lo...
 2072 This is a truly beautiful English Wilson Staff...

2073 Here we have a 1949 1st generation vulpix. Enj...
 2074 This is a purebred Piers Morgan. Loves to Netf...
 2075 Here is a very happy pup. Big fan of well-main...
 2076 This is a western brown Mitsubishi terrier. Up...
 2077 Here we have a Japanese Irish Setter. Lost eye...

	expanded_urls	name	doggo \
0	https://twitter.com/dog_rates/status/892420643...	Phineas	
1	https://twitter.com/dog_rates/status/892177421...	Tilly	
2	https://twitter.com/dog_rates/status/891815181...	Archie	
3	https://twitter.com/dog_rates/status/891689557...	Darla	
4	https://twitter.com/dog_rates/status/891327558...	Franklin	
5	https://twitter.com/dog_rates/status/891087950...	None	
6	https://gofundme.com/ydvmve-surgery-for-jax,ht...	Jax	
7	https://twitter.com/dog_rates/status/890729181...	None	
8	https://twitter.com/dog_rates/status/890609185...	Zoey	
9	https://twitter.com/dog_rates/status/890240255...	Cassie	doggo
10	https://twitter.com/dog_rates/status/890006608...	Koda	
11	https://twitter.com/dog_rates/status/889880896...	Bruno	
12	https://twitter.com/dog_rates/status/889665388...	None	
13	https://twitter.com/dog_rates/status/889638837...	Ted	
14	https://twitter.com/dog_rates/status/889531135...	Stuart	
15	https://twitter.com/dog_rates/status/889278841...	Oliver	
16	https://twitter.com/dog_rates/status/888917238...	Jim	
17	https://twitter.com/dog_rates/status/888804989...	Zeke	
18	https://twitter.com/dog_rates/status/888554962...	Ralphus	
19	https://twitter.com/dog_rates/status/888078434...	Gerald	
20	https://twitter.com/dog_rates/status/887705289...	Jeffrey	
21	https://twitter.com/dog_rates/status/887517139...	such	
22	https://twitter.com/dog_rates/status/887473957...	Canela	
23	https://twitter.com/dog_rates/status/887343217...	None	
24	https://twitter.com/dog_rates/status/887101392...	None	
25	https://twitter.com/dog_rates/status/886983233...	Maya	
26	https://www.gofundme.com/mingusneedsus,https:/...	Mingus	
27	https://twitter.com/dog_rates/status/886680336...	Derek	
28	https://twitter.com/dog_rates/status/886366144...	Roscoe	
29	https://twitter.com/dog_rates/status/886258384...	Waffles	
...
2048	https://twitter.com/dog_rates/status/666411507...	quite	
2049	https://twitter.com/dog_rates/status/666407126...	a	
2050	https://twitter.com/dog_rates/status/666396247...	None	
2051	https://twitter.com/dog_rates/status/666373753...	None	
2052	https://twitter.com/dog_rates/status/666362758...	None	
2053	https://twitter.com/dog_rates/status/666353288...	None	
2054	https://twitter.com/dog_rates/status/666345417...	None	
2055	https://twitter.com/dog_rates/status/666337882...	an	
2056	https://twitter.com/dog_rates/status/666293911...	a	
2057	https://twitter.com/dog_rates/status/666287406...	an	

2058	https://twitter.com/dog_rates/status/666273097...	None
2059	https://twitter.com/dog_rates/status/666268910...	None
2060	https://twitter.com/dog_rates/status/666104133...	None
2061	https://twitter.com/dog_rates/status/666102155...	None
2062	https://twitter.com/dog_rates/status/666099513...	None
2063	https://twitter.com/dog_rates/status/666094000...	None
2064	https://twitter.com/dog_rates/status/666082916...	None
2065	https://twitter.com/dog_rates/status/666073100...	None
2066	https://twitter.com/dog_rates/status/666071193...	None
2067	https://twitter.com/dog_rates/status/666063827...	the
2068	https://twitter.com/dog_rates/status/666058600...	the
2069	https://twitter.com/dog_rates/status/666057090...	a
2070	https://twitter.com/dog_rates/status/666055525...	a
2071	https://twitter.com/dog_rates/status/666051853...	an
2072	https://twitter.com/dog_rates/status/666050758...	a
2073	https://twitter.com/dog_rates/status/666049248...	None
2074	https://twitter.com/dog_rates/status/666044226...	a
2075	https://twitter.com/dog_rates/status/666033412...	a
2076	https://twitter.com/dog_rates/status/666029285...	a
2077	https://twitter.com/dog_rates/status/666020888...	None

	floofer	pupper	puppo	rating	stage \
0				1.3	NaN
1				1.3	NaN
2				1.2	NaN
3				1.3	NaN
4				1.2	NaN
5				1.3	NaN
6				1.3	NaN
7				1.3	NaN
8				1.3	NaN
9				1.4	doggo
10				1.3	NaN
11				1.3	NaN
12			puppo	1.3	puppo
13				1.2	NaN
14			puppo	1.3	puppo
15				1.3	NaN
16				1.2	NaN
17				1.3	NaN
18				1.3	NaN
19				1.2	NaN
20				1.3	NaN
21				1.4	NaN
22				1.3	NaN
23				1.3	NaN
24				1.2	NaN
25				1.3	NaN

26		1.3	NaN
27		1.3	NaN
28	pupper	1.2	pupper
29		1.3	NaN
...
2048		0.2	NaN
2049		0.7	NaN
2050		0.9	NaN
2051		1.1	NaN
2052		0.6	NaN
2053		0.8	NaN
2054		1.0	NaN
2055		0.9	NaN
2056		0.3	NaN
2057		0.5	NaN
2058		1.1	NaN
2059		1.0	NaN
2060		0.1	NaN
2061		1.1	NaN
2062		0.8	NaN
2063		0.9	NaN
2064		0.6	NaN
2065		1.0	NaN
2066		0.9	NaN
2067		1.0	NaN
2068		0.8	NaN
2069		0.9	NaN
2070		1.0	NaN
2071		0.2	NaN
2072		1.0	NaN
2073		0.5	NaN
2074		0.6	NaN
2075		0.9	NaN
2076		0.7	NaN
2077		0.8	NaN

	jpg_url	img_num \
0	NaN	NaN
1	https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg	1.0
2	https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg	1.0
3	NaN	NaN
4	https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg	2.0
5	https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg	1.0
6	https://pbs.twimg.com/media/DF1eOmZXUAAALUcq.jpg	1.0
7	https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg	2.0
8	https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg	1.0
9	https://pbs.twimg.com/media/DFrEyVuW0AA03t9.jpg	1.0
10	https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg	1.0

11	https://pbs.twimg.com/media/DF199B1WsAITKsg.jpg	1.0
12	https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg	1.0
13	https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg	1.0
14	https://pbs.twimg.com/media/DFg_2PVWOAEHN3p.jpg	1.0
15	https://pbs.twimg.com/ext_tw_video_thumb/88927...	1.0
16	https://pbs.twimg.com/media/DFYRgsOUQAARGh0.jpg	1.0
17	https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg	1.0
18	https://pbs.twimg.com/media/DFTH_0-UQAACu20.jpg	3.0
19	https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg	1.0
20	https://pbs.twimg.com/media/DFHQBbXgAEqY7t.jpg	1.0
21	NaN	NaN
22	https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg	2.0
23	https://pbs.twimg.com/ext_tw_video_thumb/88734...	1.0
24	https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg	1.0
25	https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg	2.0
26	https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg	1.0
27	NaN	NaN
28	https://pbs.twimg.com/media/DE0BTnQUwAApKEH.jpg	1.0
29	https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg	1.0
...
2048	NaN	NaN
2049	https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg	1.0
2050	https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg	1.0
2051	https://pbs.twimg.com/media/CT9vZEYWUAA1Z05.jpg	1.0
2052	NaN	NaN
2053	https://pbs.twimg.com/media/CT9cx0tUEAAhNN_.jpg	1.0
2054	https://pbs.twimg.com/media/CT9Vn7PW0AA_ZCM.jpg	1.0
2055	NaN	NaN
2056	NaN	NaN
2057	https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg	1.0
2058	https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg	1.0
2059	NaN	NaN
2060	NaN	NaN
2061	https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg	1.0
2062	https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg	1.0
2063	https://pbs.twimg.com/media/CT5w9gUW4AAAsBNN.jpg	1.0
2064	https://pbs.twimg.com/media/CT5m4VGWEAAAtKc8.jpg	1.0
2065	https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg	1.0
2066	https://pbs.twimg.com/media/CT5cN_3WEAA10oZ.jpg	1.0
2067	https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg	1.0
2068	https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg	1.0
2069	NaN	NaN
2070	https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg	1.0
2071	NaN	NaN
2072	https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg	1.0
2073	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1.0
2074	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1.0
2075	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1.0

2076	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1.0
2077	https://pbs.twimg.com/media/CT4udnOWwAAOaMy.jpg	1.0

	p1	p1_conf	p1_dog	retweet_count	\
0	NaN	NaN	NaN	6959	
1	Chihuahua	0.323581	True	5263	
2	Chihuahua	0.716012	True	3463	
3	NaN	NaN	NaN	7174	
4	basset	0.555712	True	7707	
5	Chesapeake_Bay_retriever	0.425595	True	2582	
6	Appenzeller	0.341703	True	1644	
7	Pomeranian	0.566142	True	15663	
8	Irish_terrier	0.487574	True	3599	
9	Pembroke	0.511319	True	6059	
10	Samoyed	0.957979	True	6105	
11	French_bulldog	0.377417	True	4135	
12	Pembroke	0.966327	True	8291	
13	French_bulldog	0.991650	True	3694	
14	golden_retriever	0.953442	True	1873	
15	whippet	0.626152	True	4413	
16	golden_retriever	0.714719	True	3739	
17	golden_retriever	0.469760	True	3508	
18	Siberian_husky	0.700377	True	2859	
19	French_bulldog	0.995026	True	2881	
20	basset	0.821664	True	4512	
21	NaN	NaN	NaN	9799	
22	Pembroke	0.809197	True	14939	
23	Mexican_hairless	0.330741	True	8764	
24	Samoyed	0.733942	True	4965	
25	Chihuahua	0.793469	True	6279	
26	kuvasz	0.309706	True	2609	
27	NaN	NaN	NaN	3715	
28	French_bulldog	0.999201	True	2609	
29	pug	0.943575	True	5243	
...	
2048	NaN	NaN	NaN	261	
2049	black-and-tan_coonhound	0.529139	True	30	
2050	Chihuahua	0.978108	True	68	
2051	soft-coated_wheaten_terrier	0.326467	True	73	
2052	NaN	NaN	NaN	463	
2053	malamute	0.336874	True	56	
2054	golden_retriever	0.858744	True	121	
2055	NaN	NaN	NaN	79	
2056	NaN	NaN	NaN	288	
2057	Maltese_dog	0.857531	True	55	
2058	Italian_greyhound	0.176053	True	66	
2059	NaN	NaN	NaN	38	
2060	NaN	NaN	NaN	5451	

2061	English_setter	0.298617	True	11
2062	Lhasa	0.582330	True	53
2063	bloodhound	0.195217	True	63
2064	pug	0.489814	True	37
2065	Walker_hound	0.260857	True	129
2066	Gordon_setter	0.503672	True	50
2067	golden_retriever	0.775930	True	180
2068	miniature_poodle	0.201493	True	47
2069	NaN	NaN	NaN	111
2070	chow	0.692517	True	196
2071	NaN	NaN	NaN	697
2072	Bernese_mountain_dog	0.651137	True	50
2073	miniature_pinscher	0.560311	True	36
2074	Rhodesian_ridgeback	0.408143	True	114
2075	German_shepherd	0.596461	True	36
2076	redbone	0.506826	True	39
2077	Welsh_springer_spaniel	0.465074	True	419

	favorite_count
0	33648
1	29193
2	21947
3	36702
4	35100
5	17721
6	10305
7	56540
8	24393
9	27796
10	26896
11	24436
12	41791
13	23551
14	13279
15	21962
16	25471
17	22342
18	17220
19	19079
20	26468
21	40539
22	59901
23	29426
24	26868
25	30187
26	10443
27	19633
28	18454

29	24396
...	...
2048	370
2049	93
2050	147
2051	162
2052	647
2053	178
2054	242
2055	168
2056	425
2057	123
2058	151
2059	99
2060	12829
2061	66
2062	134
2063	142
2064	92
2065	273
2066	127
2067	395
2068	99
2069	247
2070	366
2071	1023
2072	115
2073	88
2074	245
2075	100
2076	112
2077	2280

[2078 rows x 19 columns]

In [149]: *#Test*

df_final.info()

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2078 entries, 0 to 2077
Data columns (total 19 columns):
tweet_id      2078 non-null object
timestamp     2078 non-null datetime64[ns]
source        2078 non-null object
text          2078 non-null object
expanded_urls 2075 non-null object
name          2078 non-null object
doggo         2078 non-null object
```

```
floofer      2078 non-null object
pupper      2078 non-null object
puppo       2078 non-null object
rating      2078 non-null float64
stage       335 non-null object
jpg_url     1449 non-null object
img_num     1449 non-null float64
p1          1449 non-null object
p1_conf     1449 non-null float64
p1_dog      1449 non-null object
retweet_count 2070 non-null object
favorite_count 2070 non-null object
dtypes: datetime64[ns](1), float64(3), object(15)
memory usage: 324.7+ KB
```

```
In [150]: df_final[df_final['retweet_count'].isnull()]
```

```
Out[150]:
```

	tweet_id	timestamp	source \		text \		expanded_urls	name	doggo \
90	872261713294495745	2017-06-07 01:19:32	Twitter for iPhone		This is Harry. His ears are activated one at a...		https://twitter.com/dog_rates/status/872261713...	Harry	
202	844704788403113984	2017-03-23 00:18:10	Twitter for iPhone		This is Luna. It's her first time outside and ...		https://twitter.com/dog_rates/status/844704788...	Luna	
234	837366284874571778	2017-03-02 18:17:34	Twitter for iPhone		This is Lucy. She has a portrait of herself on...		https://twitter.com/dog_rates/status/837366284...	Lucy	
283	829374341691346946	2017-02-08 17:00:26	Twitter for iPhone		This is Astrid. She's a guide doggo in trainin...		https://twitter.com/dog_rates/status/829374341...	Astrid	doggo
571	779123168116150273	2016-09-23 01:00:13	Twitter for iPhone		This is Reggie. He hugs everyone he meets. 12/...		https://twitter.com/dog_rates/status/779123168...	Reggie	
682	759923798737051648	2016-08-01 01:28:46	Twitter for iPhone		We only rate dogs... this is a Taiwanese Guide...		https://twitter.com/dog_rates/status/759923798...	None	
721	754011816964026368	2016-07-15 17:56:40	Twitter for iPhone		This is Charlie. He pouts until he gets to go ...		https://twitter.com/dog_rates/status/754011816...	Charlie	
1472	680055455951884288	2015-12-24 16:00:30	TweetDeck		Meet Sammy. At first I was like "that's a snow...		https://twitter.com/dog_rates/status/680055455...	Sammy	

	floofer	pupper	puppo	rating	stage	\
90				1.3	NaN	
202				1.3	NaN	
234				1.3	NaN	
283				1.3	doggo	
571				1.2	NaN	
682				1.0	NaN	
721				1.2	NaN	
1472				1.0	NaN	

	jpg_url	img_num	\
90	https://pbs.twimg.com/media/DBr1Zk2UQAAfAkd.jpg	2.0	
202	https://pbs.twimg.com/media/C7j-hkSWOAIxCZC.jpg	1.0	
234	https://pbs.twimg.com/media/C57sMJwXMAASBSx.jpg	1.0	
283	https://pbs.twimg.com/media/C4KHj-nWQAA3poV.jpg	1.0	
571	https://pbs.twimg.com/media/CtAAYizW8AAWzBZ.jpg	1.0	
682	https://pbs.twimg.com/media/CovKqSYVIAAUbUW.jpg	1.0	
721	https://pbs.twimg.com/media/CnbJuPoXEAAjcVF.jpg	1.0	
1472	https://pbs.twimg.com/media/CW-ZRC_WQAAyFrL.jpg	1.0	

	p1	p1_conf	p1_dog	retweet_count	\
90	Labrador_retriever	0.972019	True	NaN	
202	Labrador_retriever	0.980213	True	NaN	
234	American_Staffordshire_terrier	0.660085	True	NaN	
283	Staffordshire_bullterrier	0.757547	True	NaN	
571	toy_poodle	0.431080	True	NaN	
682	Labrador_retriever	0.324579	True	NaN	
721	French_bulldog	0.600985	True	NaN	
1472	Samoyed	0.995466	True	NaN	

	favorite_count
90	NaN
202	NaN
234	NaN
283	NaN
571	NaN
682	NaN
721	NaN
1472	NaN

```
In [180]: df_final[df_final['favorite_count'].isnull()]
```

```
Out[180]:
```

	tweet_id	timestamp	source	\
90	872261713294495745	2017-06-07 01:19:32	Twitter for iPhone	
202	844704788403113984	2017-03-23 00:18:10	Twitter for iPhone	
234	837366284874571778	2017-03-02 18:17:34	Twitter for iPhone	
283	829374341691346946	2017-02-08 17:00:26	Twitter for iPhone	
571	779123168116150273	2016-09-23 01:00:13	Twitter for iPhone	

682	759923798737051648	2016-08-01 01:28:46	Twitter for iPhone
721	754011816964026368	2016-07-15 17:56:40	Twitter for iPhone
1472	680055455951884288	2015-12-24 16:00:30	TweetDeck

	text \
90	This is Harry. His ears are activated one at a...
202	This is Luna. It's her first time outside and ...
234	This is Lucy. She has a portrait of herself on...
283	This is Astrid. She's a guide doggo in trainin...
571	This is Reggie. He hugs everyone he meets. 12/...
682	We only rate dogs... this is a Taiwanese Guide...
721	This is Charlie. He pouts until he gets to go ...
1472	Meet Sammy. At first I was like "that's a snow...

	expanded_urls	name	doggo \
90	https://twitter.com/dog_rates/status/872261713...	Harry	
202	https://twitter.com/dog_rates/status/844704788...	Luna	
234	https://twitter.com/dog_rates/status/837366284...	Lucy	
283	https://twitter.com/dog_rates/status/829374341...	Astrid	doggo
571	https://twitter.com/dog_rates/status/779123168...	Reggie	
682	https://twitter.com/dog_rates/status/759923798...	None	
721	https://twitter.com/dog_rates/status/754011816...	Charlie	
1472	https://twitter.com/dog_rates/status/680055455...	Sammy	

	floofer	pupper	puppo	rating	stage \
90				1.3	NaN
202				1.3	NaN
234				1.3	NaN
283				1.3	doggo
571				1.2	NaN
682				1.0	NaN
721				1.2	NaN
1472				1.0	NaN

	jpg_url	img_num \
90	https://pbs.twimg.com/media/DBrlZk2UQAAfAkd.jpg	2.0
202	https://pbs.twimg.com/media/C7j-hkSWOAIxCZC.jpg	1.0
234	https://pbs.twimg.com/media/C57sMJwXMAASBSx.jpg	1.0
283	https://pbs.twimg.com/media/C4KHj-nWQAA3poV.jpg	1.0
571	https://pbs.twimg.com/media/CtAAYizW8AAWzBZ.jpg	1.0
682	https://pbs.twimg.com/media/CovKqSYVIAAUbUW.jpg	1.0
721	https://pbs.twimg.com/media/CnbJuPoXEAAjcVF.jpg	1.0
1472	https://pbs.twimg.com/media/CW-ZRC_WQAAyFrL.jpg	1.0

	p1	p1_conf	p1_dog	retweet_count \
90	Labrador_retriever	0.972019	True	NaN
202	Labrador_retriever	0.980213	True	NaN
234	American_Staffordshire_terrier	0.660085	True	NaN

283	Staffordshire_bullterrier	0.757547	True	NaN
571	toy_poodle	0.431080	True	NaN
682	Labrador_retriever	0.324579	True	NaN
721	French_bulldog	0.600985	True	NaN
1472	Samoyed	0.995466	True	NaN

	favorite_count
90	NaN
202	NaN
234	NaN
283	NaN
571	NaN
682	NaN
721	NaN
1472	NaN

```
In [164]: df_final['source'].value_counts()
```

```
Out[164]: Twitter for iPhone      1946
Vine - Make a Scene              91
Twitter Web Client               31
TweetDeck                       10
Name: source, dtype: int64
```

```
In [152]: df_tweet_clean['stage'].value_counts()
```

```
Out[152]: pupper      220
doggo      72
puppo      23
floofer     9
doggo, pupper     9
doggo, floofer    1
doggo, puppo      1
Name: stage, dtype: int64
```

```
In [167]: df_final.describe()
```

```
Out[167]:
```

	rating	img_num	p1_conf
count	2078.000000	1449.000000	1449.000000
mean	1.060132	1.213941	0.614382
std	0.215416	0.575560	0.260436
min	0.100000	1.000000	0.044333
25%	1.000000	1.000000	0.391471
50%	1.100000	1.000000	0.615678
75%	1.200000	1.000000	0.852088
max	1.400000	4.000000	0.999956

```
In [156]: df_final['favorite_count'].value_counts()
```

```

Out[156]: 3311      3
          579       3
          1271      3
          964       3
          1917      3
          3006      3
          370       3
          1050      3
          4084      3
          5609      2
          1536      2
          2336      2
          1562      2
          3089      2
          1558      2
          4809      2
          2572      2
          3581      2
          2571      2
          2191      2
          718       2
          3116      2
          281       2
          2144      2
          2198      2
          351       2
          1221      2
          371       2
          4433      2
          2594      2
          ..
          3493      1
          10746     1
          2552      1
          14774     1
          14799     1
          2490      1
          273       1
          2494      1
          14783     1
          2497      1
          2498      1
          18885     1
          2503      1
          2507      1
          2508      1
          2509      1
          1201      1

```

```

2549      1
7040      1
2516      1
2519      1
10717     1
2526      1
18912     1
2529      1
27107     1
2534      1
14826     1
2544      1
15490     1
Name: favorite_count, Length: 1902, dtype: int64

```

15.1 Storing Data

Save gathered, assessed, and cleaned master dataset to a CSV file named "twitter_archive_master.csv".

```
In [158]: df_final.to_csv("twitter_archive_master.csv", index = False)
```

15.2 Analyzing and Visualizing Data

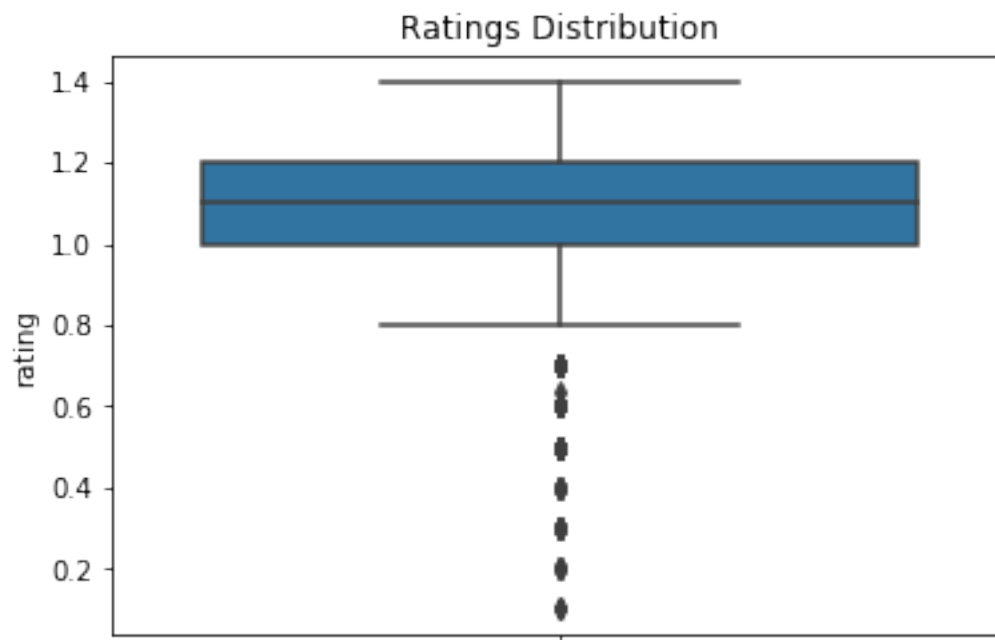
In this section, analyze and visualize your wrangled data. You must produce at least **three (3) insights and one (1) visualization**.

15.2.1 Insights:

1. The graph shows that positive correlation between retweet_counts and rating
2. The graph shows that positive correlation exist between favorite_counts and rating
3. Source showed that most of the users re from iphone compared to other devices i.e Vine, Twitter Web client, Tweetdeck.

15.2.2 Visualization

```
In [173]: sb.boxplot(y = df_final.rating);
plt.title('Ratings Distribution');
```

```
In [170]: sb.regplot(data = df_final, x = 'rating', y = 'favorite_count', scatter_kws = {'alpha': 0.1})
plt.title('Relationship between ratings & favorite_count');
```

