

# wrangle\_act

January 15, 2023

## 1 Project: Wrangling and Analyze Data

### 1.1 Data Gathering

1. Directly download the WeRateDogs Twitter archive data (twitter\_archive\_enhanced.csv)

#### Imports

```
In [247]: import pandas as pd
import numpy as np
import requests
import json
import matplotlib.pyplot as plt
%matplotlib inline
```

Importing the Twitter archive dataset

```
In [2]: twitter_archive = pd.read_csv('data/twitter-archive-enhanced.csv')
```

```
In [3]: twitter_archive.head()
```

```
Out[3]:
```

	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	

	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	

	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...

                                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

retweeted_status_user_id retweeted_status_timestamp \
0                        NaN                        NaN
1                        NaN                        NaN
2                        NaN                        NaN
3                        NaN                        NaN
4                        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

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

```

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

```
In [4]: CSV_URL = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predi
```

```
import csv
import requests
```

```
with requests.Session() as s:
    download = s.get(CSV_URL)
```

```
    decoded_content = download.content.decode('utf-8')
```

```
    cr = csv.reader(decoded_content.splitlines(), delimiter='\t')
    image_predictions = list(cr)
```

Convert the image\_predictions list to a pandas DataFrame and save it as tsv file

```
In [5]: df_image_predictions = pd.DataFrame(image_predictions[1:], columns=image_predictions[0])
df_image_predictions.to_csv('data/image_predictions.tsv', index=False)
df_image_predictions.dtypes
```

```
Out[5]: tweet_id      object
jpg_url      object
img_num      object
p1           object
p1_conf      object
p1_dog       object
p2           object
p2_conf      object
p2_dog       object
p3           object
p3_conf      object
p3_dog       object
dtype: object
```

### 3. Use the Tweepy library to query additional data via the Twitter API (tweet\_json.txt)

```
In [40]: #Remark : I got the twitter api approve after I started working on the project
# so I had already copied the solution and understood it before I got the Twitter api a
import tweepy
from tweepy import OAuthHandler
import json
from timeit import default_timer as timer

# 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 = ''
consumer_secret = ''
access_token = ''
access_secret = ''

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 = twitter_archive.tweet_id.values
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('data/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)

```

```

1: 892420643555336193
Success
2: 892177421306343426
Success
3: 891815181378084864
Success
4: 891689557279858688
Success
5: 891327558926688256
Success
6: 891087950875897856
Success
7: 890971913173991426
Success
8: 890729181411237888
Success
9: 890609185150312448
Success
10: 890240255349198849
Success
11: 890006608113172480
Success
12: 889880896479866881
Success
13: 889665388333682689
Success
14: 889638837579907072
Success
15: 889531135344209921
Success

```

16: 889278841981685760  
Success  
17: 888917238123831296  
Success  
18: 888804989199671297  
Success  
19: 888554962724278272  
Success  
20: 888202515573088257  
Fail  
21: 888078434458587136  
Success  
22: 887705289381826560  
Success  
23: 887517139158093824  
Success  
24: 887473957103951883  
Success  
25: 887343217045368832  
Success  
26: 887101392804085760  
Success  
27: 886983233522544640  
Success  
28: 886736880519319552  
Success  
29: 886680336477933568  
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30: 886366144734445568  
Success  
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Success  
32: 886258384151887873  
Success  
33: 886054160059072513  
Success  
34: 885984800019947520  
Success  
35: 885528943205470208  
Success  
36: 885518971528720385  
Success  
37: 885311592912609280  
Success  
38: 885167619883638784  
Success  
39: 884925521741709313  
Success

40: 884876753390489601  
Success  
41: 884562892145688576  
Success  
42: 884441805382717440  
Success  
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Success  
44: 884162670584377345  
Success  
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Success  
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Success  
47: 883360690899218434  
Success  
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Success  
49: 882992080364220416  
Success  
50: 882762694511734784  
Success  
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Success  
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Success  
53: 882045870035918850  
Success  
54: 881906580714921986  
Success  
55: 881666595344535552  
Success  
56: 881633300179243008  
Success  
57: 881536004380872706  
Success  
58: 881268444196462592  
Success  
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Success  
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62: 880221127280381952  
Success  
63: 880095782870896641  
Success

64: 879862464715927552  
Success  
65: 879674319642796034  
Success  
66: 879492040517615616  
Success  
67: 879415818425184262  
Success  
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Success  
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Success  
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Success  
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Success  
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Success  
74: 878404777348136964  
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Success  
76: 878281511006478336  
Success  
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Success  
78: 877736472329191424  
Success  
79: 877611172832227328  
Fail  
80: 877556246731214848  
Success  
81: 877316821321428993  
Success  
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Success  
83: 876838120628539392  
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Success  
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Fail  
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Success  
339: 832369877331693569  
Success  
340: 832273440279240704  
Success  
341: 832215909146226688  
Success  
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Success  
343: 832088576586297345  
Success  
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Success  
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Success  
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Success  
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Success  
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Success  
350: 831650051525054464  
Success  
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Success

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Success  
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Success  
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2230: 668248472370458624  
Success  
2231: 668237644992782336  
Success  
2232: 668226093875376128  
Success  
2233: 668221241640230912  
Success  
2234: 668204964695683073  
Success  
2235: 668190681446379520  
Success  
2236: 668171859951755264  
Success  
2237: 668154635664932864  
Success  
2238: 668142349051129856  
Success  
2239: 668113020489474048  
Success  
2240: 667937095915278337  
Success  
2241: 667924896115245057  
Success  
2242: 667915453470232577  
Success  
2243: 667911425562669056  
Success  
2244: 667902449697558528  
Success  
2245: 667886921285246976  
Success  
2246: 667885044254572545  
Success  
2247: 667878741721415682  
Success

2248: 667873844930215936  
Success  
2249: 667866724293877760  
Success  
2250: 667861340749471744  
Success  
2251: 667832474953625600  
Success  
2252: 667806454573760512  
Success  
2253: 667801013445750784  
Success  
2254: 667793409583771648  
Success  
2255: 667782464991965184  
Success  
2256: 667773195014021121  
Success  
2257: 667766675769573376  
Success  
2258: 667728196545200128  
Success  
2259: 667724302356258817  
Success  
2260: 667550904950915073  
Success  
2261: 667550882905632768  
Success  
2262: 667549055577362432  
Success  
2263: 667546741521195010  
Success  
2264: 667544320556335104  
Success  
2265: 667538891197542400  
Success  
2266: 667534815156183040  
Success  
2267: 667530908589760512  
Success  
2268: 667524857454854144  
Success  
2269: 667517642048163840  
Success  
2270: 667509364010450944  
Success  
2271: 667502640335572993  
Success

2272: 667495797102141441  
Success  
2273: 667491009379606528  
Success  
2274: 667470559035432960  
Success  
2275: 667455448082227200  
Success  
2276: 667453023279554560  
Success  
2277: 667443425659232256  
Success  
2278: 667437278097252352  
Success  
2279: 667435689202614272  
Success  
2280: 667405339315146752  
Success  
2281: 667393430834667520  
Success  
2282: 667369227918143488  
Success  
2283: 667211855547486208  
Success  
2284: 667200525029539841  
Success  
2285: 667192066997374976  
Success  
2286: 667188689915760640  
Success  
2287: 667182792070062081  
Success  
2288: 667177989038297088  
Success  
2289: 667176164155375616  
Success  
2290: 667174963120574464  
Success  
2291: 667171260800061440  
Success  
2292: 667165590075940865  
Success  
2293: 667160273090932737  
Success  
2294: 667152164079423490  
Success  
2295: 667138269671505920  
Success

2296: 667119796878725120  
Success  
2297: 667090893657276420  
Success  
2298: 667073648344346624  
Success  
2299: 667070482143944705  
Success  
2300: 667065535570550784  
Success  
2301: 667062181243039745  
Success  
2302: 667044094246576128  
Success  
2303: 667012601033924608  
Success  
2304: 666996132027977728  
Success  
2305: 666983947667116034  
Success  
2306: 666837028449972224  
Success  
2307: 666835007768551424  
Success  
2308: 666826780179869698  
Success  
2309: 666817836334096384  
Success  
2310: 666804364988780544  
Success  
2311: 666786068205871104  
Success  
2312: 666781792255496192  
Success  
2313: 666776908487630848  
Success  
2314: 666739327293083650  
Success  
2315: 666701168228331520  
Success  
2316: 666691418707132416  
Success  
2317: 666649482315059201  
Success  
2318: 666644823164719104  
Success  
2319: 666454714377183233  
Success

2320: 666447344410484738  
Success  
2321: 666437273139982337  
Success  
2322: 666435652385423360  
Success  
2323: 666430724426358785  
Success  
2324: 666428276349472768  
Success  
2325: 666421158376562688  
Success  
2326: 666418789513326592  
Success  
2327: 666411507551481857  
Success  
2328: 666407126856765440  
Success  
2329: 666396247373291520  
Success  
2330: 666373753744588802  
Success  
2331: 666362758909284353  
Success  
2332: 666353288456101888  
Success  
2333: 666345417576210432  
Success  
2334: 666337882303524864  
Success  
2335: 666293911632134144  
Success  
2336: 666287406224695296  
Success  
2337: 666273097616637952  
Success  
2338: 666268910803644416  
Success  
2339: 666104133288665088  
Success  
2340: 666102155909144576  
Success  
2341: 666099513787052032  
Success  
2342: 666094000022159362  
Success  
2343: 666082916733198337  
Success

```

2344: 666073100786774016
Success
2345: 666071193221509120
Success
2346: 666063827256086533
Success
2347: 666058600524156928
Success
2348: 666057090499244032
Success
2349: 666055525042405380
Success
2350: 666051853826850816
Success
2351: 666050758794694657
Success
2352: 666049248165822465
Success
2353: 666044226329800704
Success
2354: 666033412701032449
Success
2355: 666029285002620928
Success
2356: 666020888022790149
Success
1909.5976520880004
{888202515573088257: TweepError([{'code': 144, 'message': 'No status found with that ID.'}],), 8

```

Read id, retweet count and favorite count for each line at tweet-json.txt

```

In [6]: file1 = open('data/tweet-json.txt', 'r')
        Lines = file1.readlines()
        df_list = []
        for line in Lines:
            line_dict = json.loads(line.strip())
            df_list.append({'id': line_dict['id'],
                           'retweet_count': line_dict['retweet_count'],
                           'favorite_count': line_dict['favorite_count']})
        df_tweet_json = pd.DataFrame(df_list)
        df_tweet_json = df_tweet_json[['id', 'favorite_count', 'retweet_count']]
        df_tweet_json

```

```

Out[6]:

```

	id	favorite_count	retweet_count
0	892420643555336193	32870	6876
1	892177421306343426	28395	5178
2	891815181378084864	21344	3420

3	891689557279858688	35796	7074
4	891327558926688256	34274	7592
5	891087950875897856	17243	2547
6	890971913173991426	10060	1620
7	890729181411237888	55285	15442
8	890609185150312448	23790	3554
9	890240255349198849	27124	5983
10	890006608113172480	26261	6029
11	889880896479866881	23814	4077
12	889665388333682689	40850	8186
13	889638837579907072	23003	3648
14	889531135344209921	12965	1853
15	889278841981685760	21420	4358
16	888917238123831296	24884	3687
17	888804989199671297	21810	3459
18	888554962724278272	16834	2837
19	888078434458587136	18551	2841
20	887705289381826560	25805	4440
21	887517139158093824	39449	9645
22	887473957103951883	58550	14754
23	887343217045368832	28706	8611
24	887101392804085760	26138	4889
25	886983233522544640	29522	6185
26	886736880519319552	10210	2576
27	886680336477933568	19145	3666
28	886366144734445568	17991	2572
29	886267009285017600	101	4
...	...	...	...
2295	666411507551481857	364	257
2296	666407126856765440	92	30
2297	666396247373291520	146	66
2298	666373753744588802	157	73
2299	666362758909284353	640	464
2300	666353288456101888	170	56
2301	666345417576210432	232	121
2302	666337882303524864	163	78
2303	666293911632134144	417	288
2304	666287406224695296	119	55
2305	666273097616637952	148	66
2306	666268910803644416	97	38
2307	666104133288665088	12537	5383
2308	666102155909144576	63	11
2309	666099513787052032	132	53
2310	666094000022159362	139	63
2311	666082916733198337	90	37
2312	666073100786774016	272	129
2313	666071193221509120	126	49
2314	666063827256086533	389	179

2315	666058600524156928	98	46
2316	666057090499244032	245	111
2317	666055525042405380	360	193
2318	666051853826850816	1009	687
2319	666050758794694657	112	49
2320	666049248165822465	85	35
2321	666044226329800704	243	113
2322	666033412701032449	98	35
2323	666029285002620928	111	39
2324	666020888022790149	2228	416

[2325 rows x 3 columns]

## 1.2 Assessing Data

Lets start with twitter archive data set

In [8]: twitter\_archive

```
Out[8]:
```

	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	
15	889278841981685760	NaN	NaN	
16	888917238123831296	NaN	NaN	
17	888804989199671297	NaN	NaN	
18	888554962724278272	NaN	NaN	
19	888202515573088257	NaN	NaN	
20	888078434458587136	NaN	NaN	
21	887705289381826560	NaN	NaN	
22	887517139158093824	NaN	NaN	
23	887473957103951883	NaN	NaN	
24	887343217045368832	NaN	NaN	
25	887101392804085760	NaN	NaN	
26	886983233522544640	NaN	NaN	
27	886736880519319552	NaN	NaN	



28	886680336477933568	NaN	NaN
29	886366144734445568	NaN	NaN
...	...	...	...
2326	666411507551481857	NaN	NaN
2327	666407126856765440	NaN	NaN
2328	666396247373291520	NaN	NaN
2329	666373753744588802	NaN	NaN
2330	666362758909284353	NaN	NaN
2331	666353288456101888	NaN	NaN
2332	666345417576210432	NaN	NaN
2333	666337882303524864	NaN	NaN
2334	666293911632134144	NaN	NaN
2335	666287406224695296	NaN	NaN
2336	666273097616637952	NaN	NaN
2337	666268910803644416	NaN	NaN
2338	666104133288665088	NaN	NaN
2339	666102155909144576	NaN	NaN
2340	666099513787052032	NaN	NaN
2341	666094000022159362	NaN	NaN
2342	666082916733198337	NaN	NaN
2343	666073100786774016	NaN	NaN
2344	666071193221509120	NaN	NaN
2345	666063827256086533	NaN	NaN
2346	666058600524156928	NaN	NaN
2347	666057090499244032	NaN	NaN
2348	666055525042405380	NaN	NaN
2349	666051853826850816	NaN	NaN
2350	666050758794694657	NaN	NaN
2351	666049248165822465	NaN	NaN
2352	666044226329800704	NaN	NaN
2353	666033412701032449	NaN	NaN
2354	666029285002620928	NaN	NaN
2355	666020888022790149	NaN	NaN

	timestamp \
0	2017-08-01 16:23:56 +0000
1	2017-08-01 00:17:27 +0000
2	2017-07-31 00:18:03 +0000
3	2017-07-30 15:58:51 +0000
4	2017-07-29 16:00:24 +0000
5	2017-07-29 00:08:17 +0000
6	2017-07-28 16:27:12 +0000
7	2017-07-28 00:22:40 +0000
8	2017-07-27 16:25:51 +0000
9	2017-07-26 15:59:51 +0000
10	2017-07-26 00:31:25 +0000
11	2017-07-25 16:11:53 +0000
12	2017-07-25 01:55:32 +0000

13	2017-07-25	00:10:02	+0000
14	2017-07-24	17:02:04	+0000
15	2017-07-24	00:19:32	+0000
16	2017-07-23	00:22:39	+0000
17	2017-07-22	16:56:37	+0000
18	2017-07-22	00:23:06	+0000
19	2017-07-21	01:02:36	+0000
20	2017-07-20	16:49:33	+0000
21	2017-07-19	16:06:48	+0000
22	2017-07-19	03:39:09	+0000
23	2017-07-19	00:47:34	+0000
24	2017-07-18	16:08:03	+0000
25	2017-07-18	00:07:08	+0000
26	2017-07-17	16:17:36	+0000
27	2017-07-16	23:58:41	+0000
28	2017-07-16	20:14:00	+0000
29	2017-07-15	23:25:31	+0000
...			...
2326	2015-11-17	00:24:19	+0000
2327	2015-11-17	00:06:54	+0000
2328	2015-11-16	23:23:41	+0000
2329	2015-11-16	21:54:18	+0000
2330	2015-11-16	21:10:36	+0000
2331	2015-11-16	20:32:58	+0000
2332	2015-11-16	20:01:42	+0000
2333	2015-11-16	19:31:45	+0000
2334	2015-11-16	16:37:02	+0000
2335	2015-11-16	16:11:11	+0000
2336	2015-11-16	15:14:19	+0000
2337	2015-11-16	14:57:41	+0000
2338	2015-11-16	04:02:55	+0000
2339	2015-11-16	03:55:04	+0000
2340	2015-11-16	03:44:34	+0000
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

[illegible]

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 <a href="https://t.co/ws2AMaWpW">https://t.co/ws2AMaWpW</a>	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	<a href="https://twitter.com/dog_rates/status/892420643...">https://twitter.com/dog_rates/status/892420643...</a>	13	

1	<a href="https://twitter.com/dog_rates/status/892177421...">https://twitter.com/dog_rates/status/892177421...</a>	13
2	<a href="https://twitter.com/dog_rates/status/891815181...">https://twitter.com/dog_rates/status/891815181...</a>	12
3	<a href="https://twitter.com/dog_rates/status/891689557...">https://twitter.com/dog_rates/status/891689557...</a>	13
4	<a href="https://twitter.com/dog_rates/status/891327558...">https://twitter.com/dog_rates/status/891327558...</a>	12
5	<a href="https://twitter.com/dog_rates/status/891087950...">https://twitter.com/dog_rates/status/891087950...</a>	13
6	<a href="https://gofundme.com/ydvmve-surgery-for-jax,ht...">https://gofundme.com/ydvmve-surgery-for-jax,ht...</a>	13
7	<a href="https://twitter.com/dog_rates/status/890729181...">https://twitter.com/dog_rates/status/890729181...</a>	13
8	<a href="https://twitter.com/dog_rates/status/890609185...">https://twitter.com/dog_rates/status/890609185...</a>	13
9	<a href="https://twitter.com/dog_rates/status/890240255...">https://twitter.com/dog_rates/status/890240255...</a>	14
10	<a href="https://twitter.com/dog_rates/status/890006608...">https://twitter.com/dog_rates/status/890006608...</a>	13
11	<a href="https://twitter.com/dog_rates/status/889880896...">https://twitter.com/dog_rates/status/889880896...</a>	13
12	<a href="https://twitter.com/dog_rates/status/889665388...">https://twitter.com/dog_rates/status/889665388...</a>	13
13	<a href="https://twitter.com/dog_rates/status/889638837...">https://twitter.com/dog_rates/status/889638837...</a>	12
14	<a href="https://twitter.com/dog_rates/status/889531135...">https://twitter.com/dog_rates/status/889531135...</a>	13
15	<a href="https://twitter.com/dog_rates/status/889278841...">https://twitter.com/dog_rates/status/889278841...</a>	13
16	<a href="https://twitter.com/dog_rates/status/888917238...">https://twitter.com/dog_rates/status/888917238...</a>	12
17	<a href="https://twitter.com/dog_rates/status/888804989...">https://twitter.com/dog_rates/status/888804989...</a>	13
18	<a href="https://twitter.com/dog_rates/status/888554962...">https://twitter.com/dog_rates/status/888554962...</a>	13
19	<a href="https://twitter.com/dog_rates/status/887473957...">https://twitter.com/dog_rates/status/887473957...</a>	13
20	<a href="https://twitter.com/dog_rates/status/888078434...">https://twitter.com/dog_rates/status/888078434...</a>	12
21	<a href="https://twitter.com/dog_rates/status/887705289...">https://twitter.com/dog_rates/status/887705289...</a>	13
22	<a href="https://twitter.com/dog_rates/status/887517139...">https://twitter.com/dog_rates/status/887517139...</a>	14
23	<a href="https://twitter.com/dog_rates/status/887473957...">https://twitter.com/dog_rates/status/887473957...</a>	13
24	<a href="https://twitter.com/dog_rates/status/887343217...">https://twitter.com/dog_rates/status/887343217...</a>	13
25	<a href="https://twitter.com/dog_rates/status/887101392...">https://twitter.com/dog_rates/status/887101392...</a>	12
26	<a href="https://twitter.com/dog_rates/status/886983233...">https://twitter.com/dog_rates/status/886983233...</a>	13
27	<a href="https://www.gofundme.com/mingusneedsus,https:/...">https://www.gofundme.com/mingusneedsus,https:/...</a>	13
28	<a href="https://twitter.com/dog_rates/status/886680336...">https://twitter.com/dog_rates/status/886680336...</a>	13
29	<a href="https://twitter.com/dog_rates/status/886366144...">https://twitter.com/dog_rates/status/886366144...</a>	12
...	...	...
2326	<a href="https://twitter.com/dog_rates/status/666411507...">https://twitter.com/dog_rates/status/666411507...</a>	2
2327	<a href="https://twitter.com/dog_rates/status/666407126...">https://twitter.com/dog_rates/status/666407126...</a>	7
2328	<a href="https://twitter.com/dog_rates/status/666396247...">https://twitter.com/dog_rates/status/666396247...</a>	9
2329	<a href="https://twitter.com/dog_rates/status/666373753...">https://twitter.com/dog_rates/status/666373753...</a>	11
2330	<a href="https://twitter.com/dog_rates/status/666362758...">https://twitter.com/dog_rates/status/666362758...</a>	6
2331	<a href="https://twitter.com/dog_rates/status/666353288...">https://twitter.com/dog_rates/status/666353288...</a>	8
2332	<a href="https://twitter.com/dog_rates/status/666345417...">https://twitter.com/dog_rates/status/666345417...</a>	10
2333	<a href="https://twitter.com/dog_rates/status/666337882...">https://twitter.com/dog_rates/status/666337882...</a>	9
2334	<a href="https://twitter.com/dog_rates/status/666293911...">https://twitter.com/dog_rates/status/666293911...</a>	3
2335	<a href="https://twitter.com/dog_rates/status/666287406...">https://twitter.com/dog_rates/status/666287406...</a>	1
2336	<a href="https://twitter.com/dog_rates/status/666273097...">https://twitter.com/dog_rates/status/666273097...</a>	11
2337	<a href="https://twitter.com/dog_rates/status/666268910...">https://twitter.com/dog_rates/status/666268910...</a>	10
2338	<a href="https://twitter.com/dog_rates/status/666104133...">https://twitter.com/dog_rates/status/666104133...</a>	1
2339	<a href="https://twitter.com/dog_rates/status/666102155...">https://twitter.com/dog_rates/status/666102155...</a>	11
2340	<a href="https://twitter.com/dog_rates/status/666099513...">https://twitter.com/dog_rates/status/666099513...</a>	8
2341	<a href="https://twitter.com/dog_rates/status/666094000...">https://twitter.com/dog_rates/status/666094000...</a>	9
2342	<a href="https://twitter.com/dog_rates/status/666082916...">https://twitter.com/dog_rates/status/666082916...</a>	6
2343	<a href="https://twitter.com/dog_rates/status/666073100...">https://twitter.com/dog_rates/status/666073100...</a>	10

2344	<a href="https://twitter.com/dog_rates/status/666071193...">https://twitter.com/dog_rates/status/666071193...</a>	9
2345	<a href="https://twitter.com/dog_rates/status/666063827...">https://twitter.com/dog_rates/status/666063827...</a>	10
2346	<a href="https://twitter.com/dog_rates/status/666058600...">https://twitter.com/dog_rates/status/666058600...</a>	8
2347	<a href="https://twitter.com/dog_rates/status/666057090...">https://twitter.com/dog_rates/status/666057090...</a>	9
2348	<a href="https://twitter.com/dog_rates/status/666055525...">https://twitter.com/dog_rates/status/666055525...</a>	10
2349	<a href="https://twitter.com/dog_rates/status/666051853...">https://twitter.com/dog_rates/status/666051853...</a>	2
2350	<a href="https://twitter.com/dog_rates/status/666050758...">https://twitter.com/dog_rates/status/666050758...</a>	10
2351	<a href="https://twitter.com/dog_rates/status/666049248...">https://twitter.com/dog_rates/status/666049248...</a>	5
2352	<a href="https://twitter.com/dog_rates/status/666044226...">https://twitter.com/dog_rates/status/666044226...</a>	6
2353	<a href="https://twitter.com/dog_rates/status/666033412...">https://twitter.com/dog_rates/status/666033412...</a>	9
2354	<a href="https://twitter.com/dog_rates/status/666029285...">https://twitter.com/dog_rates/status/666029285...</a>	7
2355	<a href="https://twitter.com/dog_rates/status/666020888...">https://twitter.com/dog_rates/status/666020888...</a>	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 [9]: 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 [10]: twitter_archive.isna().sum()
```

```

Out[10]: tweet_id                0
         in_reply_to_status_id    2278
         in_reply_to_user_id      2278
         timestamp                0
         source                   0
         text                     0
         retweeted_status_id      2175
         retweeted_status_user_id 2175
         retweeted_status_timestamp 2175
         expanded_urls            59
         rating_numerator         0
         rating_denominator       0
         name                     0
         doggo                   0
         floofer                 0
         pupper                  0
         puppo                   0
         dtype: int64

```

```
In [11]: twitter_archive.duplicated().sum()
```

```
Out[11]: 0
```

```
In [12]: twitter_archive.doggo.value_counts()
```

```

Out[12]: None      2259
         doggo      97
         Name: doggo, dtype: int64

```

```
In [13]: twitter_archive.tweet_id.value_counts()
```

```

Out[13]: 749075273010798592    1
         741099773336379392    1
         798644042770751489    1
         825120256414846976    1
         769212283578875904    1
         700462010979500032    1
         780858289093574656    1
         699775878809702401    1

```

880095782870896641	1
760521673607086080	1
776477788987613185	1
691820333922455552	1
715696743237730304	1
714606013974974464	1
760539183865880579	1
813157409116065792	1
676430933382295552	1
743510151680958465	1
837012587749474308	1
833722901757046785	1
818259473185828864	1
670704688707301377	1
667160273090932737	1
674394782723014656	1
672082170312290304	1
670093938074779648	1
759923798737051648	1
809920764300447744	1
805487436403003392	1
838085839343206401	1
	.
763956972077010945	1
870308999962521604	1
720775346191278080	1
785927819176054784	1
783347506784731136	1
775733305207554048	1
834209720923721728	1
825026590719483904	1
758405701903519748	1
668986018524233728	1
690938899477221376	1
667911425562669056	1
754482103782404096	1
713175907180089344	1
669015743032369152	1
672068090318987265	1
816829038950027264	1
683773439333797890	1
674291837063053312	1
837482249356513284	1
767500508068192258	1
773922284943896577	1
673342308415348736	1
886054160059072513	1
748307329658011649	1

```

715360349751484417    1
666817836334096384    1
794926597468000259    1
673705679337693185    1
700151421916807169    1
Name: tweet_id, Length: 2356, dtype: int64

```

```
In [14]: twitter_archive.floofer.value_counts()
```

```

Out[14]: None          2346
         floofer        10
         Name: floofer, dtype: int64

```

```
In [15]: twitter_archive.pupper.value_counts()
```

```

Out[15]: None          2099
         pupper         257
         Name: pupper, dtype: int64

```

```
In [16]: twitter_archive.puppo.value_counts()
```

```

Out[16]: None          2326
         puppo          30
         Name: puppo, dtype: int64

```

```
In [17]: twitter_archive.name.value_counts()
```

```

Out[17]: None          745
         a              55
         Charlie        12
         Cooper         11
         Oliver         11
         Lucy           11
         Tucker         10
         Penny          10
         Lola           10
         Bo              9
         Winston        9
         the             8
         Sadie           8
         Buddy           7
         an              7
         Bailey         7
         Daisy           7
         Toby            7
         Bella           6
         Scout           6
         Stanley         6
         Dave            6

```

Jack	6
Koda	6
Rusty	6
Oscar	6
Leo	6
Jax	6
Milo	6
Gus	5
...	
Heinrich	1
Gordon	1
life	1
Stella	1
Loomis	1
Rinna	1
Donny	1
Bert	1
Katie	1
Emma	1
Tassy	1
Nimbus	1
Juckson	1
Amy	1
Jessifer	1
Erik	1
Timmy	1
Mike	1
Bertson	1
Jim	1
Lipton	1
Callie	1
Tessa	1
Willow	1
Buddah	1
Severus	1
Dixie	1
Kloey	1
Ivar	1
Ebby	1

Name: name, Length: 957, dtype: int64

In [18]: twitter\_archive.describe()

Out[18]:	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 [19]: twitter_archive.rating_numerator.value_counts()
```

```
Out[19]: 12      558
          11      464
          10      461
          13      351
           9      158
           8      102
           7       55
          14       54
           5       37
           6       32
           3       19
           4       17
           1        9
           2        9
          420        2
           0         2
          15         2
          75         2
          80         1
          20         1
          24         1
```

26	1
44	1
50	1
60	1
165	1
84	1
88	1
144	1
182	1
143	1
666	1
960	1
1776	1
17	1
27	1
45	1
99	1
121	1
204	1

Name: rating\_numerator, dtype: int64

In [20]: twitter\_archive.rating\_denominator.value\_counts()

Out[20]:

10	2333
11	3
50	3
80	2
20	2
2	1
16	1
40	1
70	1
15	1
90	1
110	1
120	1
130	1
150	1
170	1
7	1
0	1

Name: rating\_denominator, dtype: int64

In [21]: twitter\_archive.dtypes

Out[21]:

tweet_id	int64
in_reply_to_status_id	float64
in_reply_to_user_id	float64
timestamp	object

source	object
text	object
retweeted_status_id	float64
retweeted_status_user_id	float64
retweeted_status_timestamp	object
expanded_urls	object
rating_numerator	int64
rating_denominator	int64
name	object
doggo	object
floofer	object
pupper	object
puppo	object
dtype:	object

In [22]: df\_image\_predictions

Out [22]:	tweet_id	jpg_url \
0	666020888022790149	<a href="https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg">https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg</a>
1	666029285002620928	<a href="https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg">https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg</a>
2	666033412701032449	<a href="https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg">https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg</a>
3	666044226329800704	<a href="https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg">https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg</a>
4	666049248165822465	<a href="https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg">https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg</a>
5	666050758794694657	<a href="https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg">https://pbs.twimg.com/media/CT5Jof1WUAEuVxN.jpg</a>
6	666051853826850816	<a href="https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg">https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg</a>
7	666055525042405380	<a href="https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg">https://pbs.twimg.com/media/CT5N9tpXIAAifs1.jpg</a>
8	666057090499244032	<a href="https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg">https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg</a>
9	666058600524156928	<a href="https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg">https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg</a>
10	666063827256086533	<a href="https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg">https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg</a>
11	666071193221509120	<a href="https://pbs.twimg.com/media/CT5cN_3WEAA10oZ.jpg">https://pbs.twimg.com/media/CT5cN_3WEAA10oZ.jpg</a>
12	666073100786774016	<a href="https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg">https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg</a>
13	666082916733198337	<a href="https://pbs.twimg.com/media/CT5m4VGWEAAAtKc8.jpg">https://pbs.twimg.com/media/CT5m4VGWEAAAtKc8.jpg</a>
14	666094000022159362	<a href="https://pbs.twimg.com/media/CT5w9gUW4AAaBNN.jpg">https://pbs.twimg.com/media/CT5w9gUW4AAaBNN.jpg</a>
15	666099513787052032	<a href="https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg">https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg</a>
16	666102155909144576	<a href="https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg">https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg</a>
17	666104133288665088	<a href="https://pbs.twimg.com/media/CT56LSZW0AA1Jj2.jpg">https://pbs.twimg.com/media/CT56LSZW0AA1Jj2.jpg</a>
18	666268910803644416	<a href="https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg">https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg</a>
19	666273097616637952	<a href="https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg">https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg</a>
20	666287406224695296	<a href="https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg">https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg</a>
21	666293911632134144	<a href="https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg">https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg</a>
22	666337882303524864	<a href="https://pbs.twimg.com/media/CT90wFIWEAMuRje.jpg">https://pbs.twimg.com/media/CT90wFIWEAMuRje.jpg</a>
23	666345417576210432	<a href="https://pbs.twimg.com/media/CT9Vn7PW0AA_ZCM.jpg">https://pbs.twimg.com/media/CT9Vn7PW0AA_ZCM.jpg</a>
24	666353288456101888	<a href="https://pbs.twimg.com/media/CT9cx0tUEAAhNN_.jpg">https://pbs.twimg.com/media/CT9cx0tUEAAhNN_.jpg</a>
25	666362758909284353	<a href="https://pbs.twimg.com/media/CT9lXGsUcAAyUft.jpg">https://pbs.twimg.com/media/CT9lXGsUcAAyUft.jpg</a>
26	666373753744588802	<a href="https://pbs.twimg.com/media/CT9vZEYWUAA1Z05.jpg">https://pbs.twimg.com/media/CT9vZEYWUAA1Z05.jpg</a>
27	666396247373291520	<a href="https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg">https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg</a>
28	666407126856765440	<a href="https://pbs.twimg.com/media/CT-NvwmW4AAAugGZ.jpg">https://pbs.twimg.com/media/CT-NvwmW4AAAugGZ.jpg</a>
29	666411507551481857	<a href="https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg">https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg</a>



```

...
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/DE5Se8FXcAAJFx4.jpg
2048 886983233522544640 https://pbs.twimg.com/media/DE8yicJW0AAAABJ.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-UQAACu20.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_2PVWOAEHN3p.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/DF199B1WsAITKsg.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/DF1eOmZXUAAALUcq.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	\
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	0.9330120000000001	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	0.77593	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	0.58233	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	0.8575309999999999	True
21	1	three-toed_sloth	0.9146709999999999	False
22	1	ox	0.41666899999999996	False
23	1	golden_retriever	0.8587440000000001	True
24	1	malamute	0.33687399999999995	True
25	1	guinea_pig	0.9964959999999999	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	0.40464	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	0.9950260000000001	True
2055	2	Pembroke	0.809197	True
2056	3	Siberian_husky	0.700377	True
2057	1	golden_retriever	0.46976	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	0.99165	True
2062	1	Pembroke	0.966327	True
2063	1	French_bulldog	0.377417	True
2064	1	Samoyed	0.9579790000000001	True
2065	1	Pembroke	0.511319	True
2066	1	Irish_terrier	0.48757399999999995	True
2067	2	Pomeranian	0.566142	True
2068	1	Appenzeller	0.34170300000000003	True
2069	1	Chesapeake_Bay_retriever	0.425595	True
2070	2	basset	0.555712	True
2071	1	paper_towel	0.17027799999999998	False
2072	1	Chihuahua	0.716012	True
2073	1	Chihuahua	0.323581	True
2074	1	orange	0.09704860000000001	False

p2

p2\_conf p2\_dog \

0	collie	0.156665	True
1	miniature_pinscher	0.07419169999999999	True
2	malinois	0.13858399999999998	True
3	redbone	0.360687	True
4	Rottweiler	0.243682	True
5	English_springer	0.263788	True
6	mud_turtle	0.04588540000000001	False
7	Tibetan_mastiff	0.058279399999999995	True
8	shopping_basket	0.014593799999999999	False
9	komondor	0.192305	True
10	Tibetan_mastiff	0.0937178	True
11	Yorkshire_terrier	0.174201	True
12	English_foxhound	0.17538199999999998	True
13	bull_mastiff	0.40472199999999997	True
14	German_shepherd	0.0782598	True
15	Shih-Tzu	0.166192	True
16	Newfoundland	0.149842	True
17	cock	0.0339194	False
18	desk	0.0855474	False
19	toy_terrier	0.111884	True
20	toy_poodle	0.0630638	True
21	otter	0.01525	False
22	Newfoundland	0.278407	True
23	Chesapeake_Bay_retriever	0.054786800000000004	True
24	Siberian_husky	0.147655	True
25	skunk	0.00240245	False
26	Afghan_hound	0.25955100000000003	True
27	toy_terrier	0.00939697	True
28	bloodhound	0.24422	True
29	barracouta	0.271485	False
...	...	...	...
2045	Chihuahua	0.00036117800000000003	True
2046	sports_car	0.139952	False
2047	Great_Pyrenees	0.186136	True
2048	toy_terrier	0.143528	True
2049	Eskimo_dog	0.0350295	True
2050	sea_lion	0.275645	False
2051	Rhodesian_ridgeback	0.05495	True
2052	tow_truck	0.0291754	False
2053	redbone	0.0875815	True
2054	pug	0.00093190800000000001	True
2055	Rhodesian_ridgeback	0.05495	True
2056	Eskimo_dog	0.166511	True
2057	Labrador_retriever	0.184172	True
2058	Tibetan_mastiff	0.12018399999999999	True
2059	borzoi	0.194742	True
2060	Labrador_retriever	0.0138341	True
2061	boxer	0.00212864	True

2062	Cardigan	0.0273557	True
2063	Labrador_retriever	0.151317	True
2064	Pomeranian	0.0138835	True
2065	Cardigan	0.451038	True
2066	Irish_setter	0.193054	True
2067	Eskimo_dog	0.17840599999999998	True
2068	Border_collie	0.199287	True
2069	Irish_terrier	0.116317	True
2070	English_springer	0.22576999999999997	True
2071	Labrador_retriever	0.16808599999999999	True
2072	malamute	0.078253	True
2073	Pekinese	0.0906465	True
2074	bagel	0.08585110000000001	False

	p3	p3_conf	p3_dog
0	Shetland_sheepdog	0.0614285	True
1	Rhodesian_ridgeback	0.07201	True
2	bloodhound	0.11619700000000001	True
3	miniature_pinscher	0.222752	True
4	Doberman	0.154629	True
5	Greater_Swiss_Mountain_dog	0.0161992	True
6	terrapin	0.017885299999999996	False
7	fur_coat	0.0544486	False
8	golden_retriever	0.00795896	True
9	soft-coated_wheaten_terrier	0.08208610000000001	True
10	Labrador_retriever	0.07242660000000001	True
11	Pekinese	0.109454	True
12	Ibizan_hound	0.0974705	True
13	French_bulldog	0.0489595	True
14	malinois	0.07562780000000001	True
15	Dandie_Dinmont	0.0896883	True
16	borzoi	0.133649	True
17	partridge	5.20658e-05	False
18	bookcase	0.0794797	False
19	basenji	0.111152	True
20	miniature_poodle	0.0255806	True
21	great_grey_owl	0.0132072	False
22	groenendael	0.10264300000000001	True
23	Labrador_retriever	0.014240899999999999	True
24	Eskimo_dog	0.09341239999999999	True
25	hamster	0.00046086300000000005	False
26	briard	0.20680300000000001	True
27	papillon	0.00457681	True
28	flat-coated_retriever	0.17381	True
29	gar	0.189945	False
...	...	...	...
2045	Boston_bull	7.55616e-05	True
2046	car_wheel	0.044172699999999995	False

2047	Dandie_Dinmont	0.086346300000000001	True
2048	can_opener	0.0322529	False
2049	Staffordshire_bullterrier	0.0297047000000000004	True
2050	Weimaraner	0.134203	True
2051	beagle	0.0389148	True
2052	shopping_cart	0.0263208	False
2053	Weimaraner	0.0262364000000000003	True
2054	bull_mastiff	0.000903211	True
2055	beagle	0.0389148	True
2056	malamute	0.111411	True
2057	English_setter	0.0734817	True
2058	Labrador_retriever	0.10550599999999999	True
2059	Saluki	0.0273507000000000002	True
2060	redbone	0.00795775	True
2061	Staffordshire_bullterrier	0.00149818	True
2062	basenji	0.00463323	True
2063	muzzle	0.0829811	False
2064	chow	0.00816748	True
2065	Chihuahua	0.0292482000000000002	True
2066	Chesapeake_Bay_retriever	0.118184	True
2067	Pembroke	0.0765069	True
2068	ice_lolly	0.193548	False
2069	Indian_elephant	0.07690219999999999	False
2070	German_short-haired_pointer	0.175219	True
2071	spatula	0.0408359	False
2072	kelpie	0.0313789	True
2073	papillon	0.0689569	True
2074	banana	0.07611	False

[2075 rows x 12 columns]

In [23]: df\_image\_predictions.dtypes

```
Out[23]: tweet_id    object
         jpg_url     object
         img_num     object
         p1          object
         p1_conf     object
         p1_dog      object
         p2          object
         p2_conf     object
         p2_dog      object
         p3          object
         p3_conf     object
         p3_dog      object
         dtype: object
```

In [24]: df\_image\_predictions.p1\_dog.value\_counts()

```
Out[24]: True      1532
        False     543
        Name: p1_dog, dtype: int64
```

```
In [25]: df_image_predictions.p1.value_counts()
```

```
Out[25]: golden_retriever      150
        Labrador_retriever    100
        Pembroke                89
        Chihuahua              83
        pug                    57
        chow                   44
        Samoyed                43
        toy_poodle             39
        Pomeranian             38
        cocker_spaniel         30
        malamute               30
        French_bulldog        26
        miniature_pinscher    23
        Chesapeake_Bay_retriever 23
        seat_belt              22
        Staffordshire_bullterrier 20
        German_shepherd        20
        Siberian_husky         20
        web_site               19
        Cardigan               19
        beagle                 18
        Maltese_dog            18
        Eskimo_dog             18
        teddy                  18
        Shetland_sheepdog      18
        Rottweiler             17
        Lakeland_terrier       17
        Shih-Tzu               17
        Italian_greyhound      16
        kuvasz                 16
        ...
        pool_table             1
        Madagascar_cat         1
        black-footed_ferret    1
        barbell                 1
        bearskin                1
        hand_blower             1
        groenendael             1
        radio_telescope         1
        sundial                 1
        tailed_frog             1
        rapeseed                1
```

```

studio_couch          1
bookshop              1
cowboy_boot           1
shield               1
conch                1
three-toed_sloth     1
mud_turtle           1
piggy_bank           1
espresso             1
clumber              1
hammer               1
revolver             1
cougar               1
book_jacket          1
dhole                1
lorikeet             1
bonnet               1
fiddler_crab         1
bee_eater            1
Name: p1, Length: 378, dtype: int64

```

```
In [40]: df_image_predictions[(df_image_predictions.p1_dog == False) & (df_image_predictions.p2_
```

```
Out[40]: Empty DataFrame
```

```

Columns: [tweet_id, jpg_url, img_num, p1, p1_conf, p1_dog, p2, p2_conf, p2_dog, p3, p3_
Index: []

```

```
In [44]: df_tweet_json
```

```

Out[44]:
   id  favorite_count  retweet_count
0  892420643555336193         32870         6876
1  892177421306343426         28395         5178
2  891815181378084864         21344         3420
3  891689557279858688         35796         7074
4  891327558926688256         34274         7592
5  891087950875897856         17243         2547
6  890971913173991426         10060         1620
7  890729181411237888         55285        15442
8  890609185150312448         23790         3554
9  890240255349198849         27124         5983
10 890006608113172480         26261         6029
11 889880896479866881         23814         4077
12 889665388333682689         40850         8186
13 889638837579907072         23003         3648
14 889531135344209921         12965         1853
15 889278841981685760         21420         4358
16 888917238123831296         24884         3687
17 888804989199671297         21810         3459
18 888554962724278272         16834         2837

```

19	888078434458587136	18551	2841
20	887705289381826560	25805	4440
21	887517139158093824	39449	9645
22	887473957103951883	58550	14754
23	887343217045368832	28706	8611
24	887101392804085760	26138	4889
25	886983233522544640	29522	6185
26	886736880519319552	10210	2576
27	886680336477933568	19145	3666
28	886366144734445568	17991	2572
29	886267009285017600	101	4
...	...	...	...
2295	666411507551481857	364	257
2296	666407126856765440	92	30
2297	666396247373291520	146	66
2298	666373753744588802	157	73
2299	666362758909284353	640	464
2300	666353288456101888	170	56
2301	666345417576210432	232	121
2302	666337882303524864	163	78
2303	666293911632134144	417	288
2304	666287406224695296	119	55
2305	666273097616637952	148	66
2306	666268910803644416	97	38
2307	666104133288665088	12537	5383
2308	666102155909144576	63	11
2309	666099513787052032	132	53
2310	666094000022159362	139	63
2311	666082916733198337	90	37
2312	666073100786774016	272	129
2313	666071193221509120	126	49
2314	666063827256086533	389	179
2315	666058600524156928	98	46
2316	666057090499244032	245	111
2317	666055525042405380	360	193
2318	666051853826850816	1009	687
2319	666050758794694657	112	49
2320	666049248165822465	85	35
2321	666044226329800704	243	113
2322	666033412701032449	98	35
2323	666029285002620928	111	39
2324	666020888022790149	2228	416

[2325 rows x 3 columns]

```
In [45]: df_tweet_json.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2325 entries, 0 to 2324
```



```
Data columns (total 3 columns):
id                2325 non-null int64
favorite_count    2325 non-null int64
retweet_count     2325 non-null int64
dtypes: int64(3)
memory usage: 54.6 KB
```

```
In [46]: df_tweet_json.favorite_count.value_counts()
```

```
Out[46]: 0          158
         2005         3
         6017         3
         690          3
        1356         3
        1871         3
        3457         3
        2191         3
        2543         3
         101         3
         800         3
         658         3
         203         3
         297         3
         208         3
        2963         3
         322         3
        2288         3
         199         3
        2014         3
        1707         3
         389         3
        3097         3
        2902         3
         385         2
        1946         2
        5633         2
        1526         2
        2509         2
        1463         2
         ...
        6786         1
         639         1
        2630         1
         633         1
        6728         1
       12873         1
         587         1
```

```

591      1
6736     1
12881    1
597      1
14934    1
10840    1
601      1
2650     1
603      1
45661    1
609      1
2658     1
10852    1
615      1
2664     1
4713     1
619      1
2668     1
4717     1
1250     1
625      1
4723     1
10270    1
Name: favorite_count, Length: 1955, dtype: int64

```

```
In [47]: df_tweet_json.dtypes
```

```

Out[47]: id                int64
         favorite_count    int64
         retweet_count     int64
         dtype: object

```

### 1.3 Visual assessment

<li>Completeness issues: Twitter archive contains 2356 rows but image predictions data set contains 1955 rows

<li>Twitter archive data set:<ul><li> Rows 2351 and 2355 contain missing data on the name column<li>The last four columns (doggo,floofer,pupper,puppo) contain lot of missing data and these are not null<li>Missing data in lot of columns like (in\_reply\_to\_status\_id, in\_reply\_to\_user\_id)</li></ul>

### 1.4 Programmatic assessment

<li>Twitter archive data set:<ul><li>Contains retweets (should be dropped)</li><li>Rating denominator has a value of 0 (impossible value)</li><li>Column 'name' contains missing values as string 'None' and not NaN, the same for columns 'doggo', 'floofer', 'pupper', 'puppo'</li><li>Column timestamp is type object, it should be date</li></ul>

<li>Image predictions data set:<ul>

- <li>Contains prediction of Not dog objects (324 rows)</li>
- <li>Object type for columns p1\_dog,p2,dog and p3\_dog (should be boolean) </li>

</ul>
</li>

### 1.4.1 Quality issues

- <li>Drop retweet rows</li>
- <li>Drop row with denominator 0</li>
- <li>Column name in twitter archive convert 'None' values to NaN</li>
- <li>Convert column timestamp type from object to datetime</li>
- <li>Drop columns retweeted\_status\_id ,retweeted\_status\_user\_id ,retweeted\_status\_timestamp because of missing values</li>
- <li>Convert the value of None in columns doggo, floofer, pupper,puppo to NaN</li>
- <li>Convert p1\_dog,p2\_dog,p3\_dog types to Boolean type</li>
- <li>Drop not dog (p\*\_dog == False) rows from all the datasets</li>
- <li>Join the 3 datasets to one dataset in order to drop the missing rows (completeness issue)</li>

### 1.4.2 Tidiness issues

- <li>Convert columns doggo, floofer, pupper,puppo to single column 'dog\_noun' with 4 possible values</li>
- <li>Create new column pf for final prediction value in image predictions data set taking in count the number of dogs</li>

## 1.5 Cleaning Data

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

```
In [80]: # Make copies of original pieces of data
df_ta = twitter_archive.copy()
df_ip = df_image_predictions.copy()
df_tj = df_tweet_json.copy()
```

### 1.5.1 1 Twitter archive data set contains retweets:

**Define:** Drop retweet rows

#### Code

```
In [81]: df_ta = df_ta[df_ta['retweeted_status_id'].isna()]
```

#### Test

```
In [82]: df_ta.shape[0]
```

```
Out[82]: 2175
```

```
In [83]: df_ta.info()
```

```

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 17 columns):
tweet_id                2175 non-null int64
in_reply_to_status_id   78 non-null float64
in_reply_to_user_id     78 non-null float64
timestamp               2175 non-null object
source                  2175 non-null object
text                    2175 non-null object
retweeted_status_id      0 non-null float64
retweeted_status_user_id 0 non-null float64
retweeted_status_timestamp 0 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: float64(4), int64(3), object(10)
memory usage: 305.9+ KB

```

```
In [84]: assert df_ta.shape[0] == df_ta['retweeted_status_id'].isna().sum()
```

### 1.5.2 2 Columns `retweeted_status_id`, `retweeted_status_user_id`, `retweeted_status_timestamp` belong to retweets:

**Define** Drop columns `retweeted_status_id`, `retweeted_status_user_id`, `retweeted_status_timestamp` because they belong to retweets

#### Code

```
In [106]: df_ta = df_ta.drop(['retweeted_status_id', 'retweeted_status_user_id', 'retweeted_status_timestamp'])
```

#### Test

```
In [108]: df_ta.columns
```

```
Out[108]: Index(['tweet_id', 'in_reply_to_status_id', 'in_reply_to_user_id', 'timestamp',
                 'source', 'text', 'expanded_urls', 'rating_numerator',
                 'rating_denominator', 'name', 'doggo', 'floofer', 'pupper', 'puppo'],
                dtype='object')
```

### 1.5.3 3 Rating denominator has a value of 0 (impossible value):

**Define:** Drop row with denominator 0

## Code

```
In [85]: df_ta = df_ta[df_ta.rating_denominator != 0]
```

## Test

```
In [86]: df_ta[df_ta.rating_denominator == 0 ]
```

```
Out[86]: Empty DataFrame
```

```
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp, source, text]
```

```
Index: []
```

## 1.5.4 4 Column 'name' contains missing values as string 'None' and not NaN:

**Define:** Convert 'None' values to NaN

## Code

```
In [87]: df_ta.name = df_ta.name.replace('None',np.NaN)
```

## Test

```
In [93]: df_ta[df_ta.name == 'None']
```

```
Out[93]: Empty DataFrame
```

```
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp, source, text]
```

```
Index: []
```

```
In [95]: df_ta.name.isna().sum()
```

```
Out[95]: 679
```

## 1.5.5 5 Column timestamp is type object, it should be date:

**Define:** Convert column timestamp type from object to datetime

## Code

```
In [110]: df_ta.timestamp = pd.to_datetime(df_ta['timestamp'])
```

## Test

```
In [112]: df_ta.dtypes
```

```
Out[112]: tweet_id          int64
          in_reply_to_status_id  float64
          in_reply_to_user_id    float64
          timestamp            datetime64[ns]
          source                object
          text                  object
```

```

expanded_urls      object
rating_numerator   int64
rating_denominator int64
name               object
doggo              object
floofer            object
pupper             object
puppo              object
dtype: object

```

### 1.5.6 6 Value of None in columns doggo, floofer, pupper,puppo to NaN:

**Define:** Convert the value of None in columns doggo, floofer, pupper,puppo to NaN

#### Code

```

In [119]: df_ta.doggo = df_ta.doggo.replace('None',np.NaN)
          df_ta.floofer = df_ta.floofer.replace('None',np.NaN)
          df_ta.pupper = df_ta.pupper.replace('None',np.NaN)
          df_ta.puppo = df_ta.puppo.replace('None',np.NaN)

```

#### Test

```

In [120]: df_ta.isna().sum()

```

```

Out[120]: tweet_id      0
          in_reply_to_status_id    2097
          in_reply_to_user_id    2097
          timestamp      0
          source          0
          text           0
          expanded_urls    57
          rating_numerator    0
          rating_denominator  0
          name            679
          doggo           2087
          floofer         2164
          pupper          1940
          puppo           2149
          dtype: int64

```

```

In [122]: df_ta.doggo.value_counts(),df_ta.floofer.value_counts(),df_ta.pupper.value_counts(),df

```

```

Out[122]: (doggo      87
          Name: doggo, dtype: int64, floofer      10
          Name: floofer, dtype: int64, pupper     234
          Name: pupper, dtype: int64, puppo      25
          Name: puppo, dtype: int64)

```

### 1.5.7 7 Object type for columns p1\_dog,p2\_dog and p3\_dog (should be boolean):

**Define:** Convert p1\_dog,p2\_dog,p3\_dog types to Boolean type (image predictions data set)

#### Code

```
In [102]: df_ip = df_ip.replace({'p1_dog': {'True': True, 'False': False},  
                                'p2_dog': {'True': True, 'False': False},  
                                'p3_dog': {'True': True, 'False': False}})
```

#### Test

```
In [103]: df_ip.dtypes
```

```
Out[103]: tweet_id    object  
          jpg_url     object  
          img_num     object  
          p1          object  
          p1_conf     object  
          p1_dog      bool  
          p2          object  
          p2_conf     object  
          p2_dog      bool  
          p3          object  
          p3_conf     object  
          p3_dog      bool  
          dtype: object
```

### 1.5.8 8 Image predictions data set contains not dog rows

**Define:** Drop not dog (p1\_dog == p2\_dog == p3\_dog == False) rows

#### Code

```
In [117]: df_ip = df_ip[~((df_ip['p1_dog'] == False) & (df_ip['p2_dog'] == False) & (df_ip['p3_dog'] == False))]
```

#### Test

```
In [118]: df_ip[((df_ip['p1_dog'] == False) & (df_ip['p2_dog'] == False) & (df_ip['p3_dog'] == False))]
```

```
Out[118]: Empty DataFrame  
          Columns: [tweet_id, jpg_url, img_num, p1, p1_conf, p1_dog, p2, p2_conf, p2_dog, p3, p3_conf, p3_dog]  
          Index: []
```

### 1.5.9 9 The 3 datasets do not contain the same count of rows (completeness issue):

**Define:** Join the 3 datasets to one dataset in order to drop the missing rows (completeness issue)

## Code

```
In [126]: df_ip.tweet_id = df_ip.tweet_id.astype(int)
          df_join = pd.merge(df_ta, df_ip,
                             on=['tweet_id'])

In [132]: df_join = pd.merge(df_join, df_tj,
                             right_on=['id'],left_on=['tweet_id'])
```

## Test

```
In [136]: df_join.shape , df_join.columns

Out[136]: ((1678, 28),
           Index(['tweet_id', 'in_reply_to_status_id', 'in_reply_to_user_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', 'id', 'favorite_count',
                 'retweet_count'],
                 dtype='object'))
```

### 1.5.10 10 Four variables being columns (doggo, floofer, pupper,puppo) :

**Define:** Convert columns doggo, floofer, pupper,puppo to single column 'dog\_noun' with 4 possible values (doggo, floofer, pupper,puppo)

## Code

```
In [210]: ggg = df_join.copy()

In [211]: ggg['dog_noun'] = np.NaN
          ggg.dog_noun.isna().sum() == ggg.shape[0]

Out[211]: True

In [213]: ggg.loc[ggg['doggo'] == 'doggo', 'dog_noun'] = 'doggo'
          ggg.loc[ggg['floofer'] == 'floofer', 'dog_noun'] = 'floofer'
          ggg.loc[ggg['pupper'] == 'pupper', 'dog_noun'] = 'pupper'
          ggg.loc[ggg['puppo'] == 'puppo', 'dog_noun'] = 'puppo'
          df_join = ggg.drop(['doggo', 'floofer', 'pupper', 'puppo'],axis = 1)
```

## Test

```
In [215]: df_join.columns

Out[215]: Index(['tweet_id', 'in_reply_to_status_id', 'in_reply_to_user_id', 'timestamp',
                 'source', 'text', 'expanded_urls', 'rating_numerator',
                 'rating_denominator', 'name', 'jpg_url', 'img_num', 'p1', 'p1_conf',
                 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3', 'p3_conf', 'p3_dog', 'id',
                 'favorite_count', 'retweet_count', 'dog_noun'],
                 dtype='object')
```



```
In [214]: df_join.dog_noun.value_counts()
```

```
Out[214]: pupper      176
          doggo       53
          puppo       22
          floofer      8
          Name: dog_noun, dtype: int64
```

### 1.5.11 11 Image predictions columns p1 ,p2 and p3 in one final column pf:

**Define:** Create new column pf for final prediction value in image predictions data set taking in count the the prediction that has value True for columns p\*\_dog

#### Code

```
In [216]: df_join['pf'] = np.NaN
```

```
In [223]: df_join.loc[df_join['p1_dog'] == True, 'pf'] = df_join['p1']
```

```
In [229]: df_join.loc[df_join['p1_dog'] == False, 'pf'] = df_join['p2']
          df_join.loc[df_join['p2_dog'] == False, 'pf'] = df_join['p3']
```

#### Test

```
In [230]: df_join.pf.isna().sum()
```

```
Out[230]: 0
```

## 1.6 Storing Data

Save gathered, assessed, and cleaned master dataset to a CSV file named "twitter\_archive\_master.csv".

```
In [231]: df_join.to_csv('twitter_archive_master.csv',index=False)
```

## 1.7 Analyzing and Visualizing Data

Remark : I didn't really understand what to do here (insights) so I'm waiting for the review

### 1.7.1 Insights:

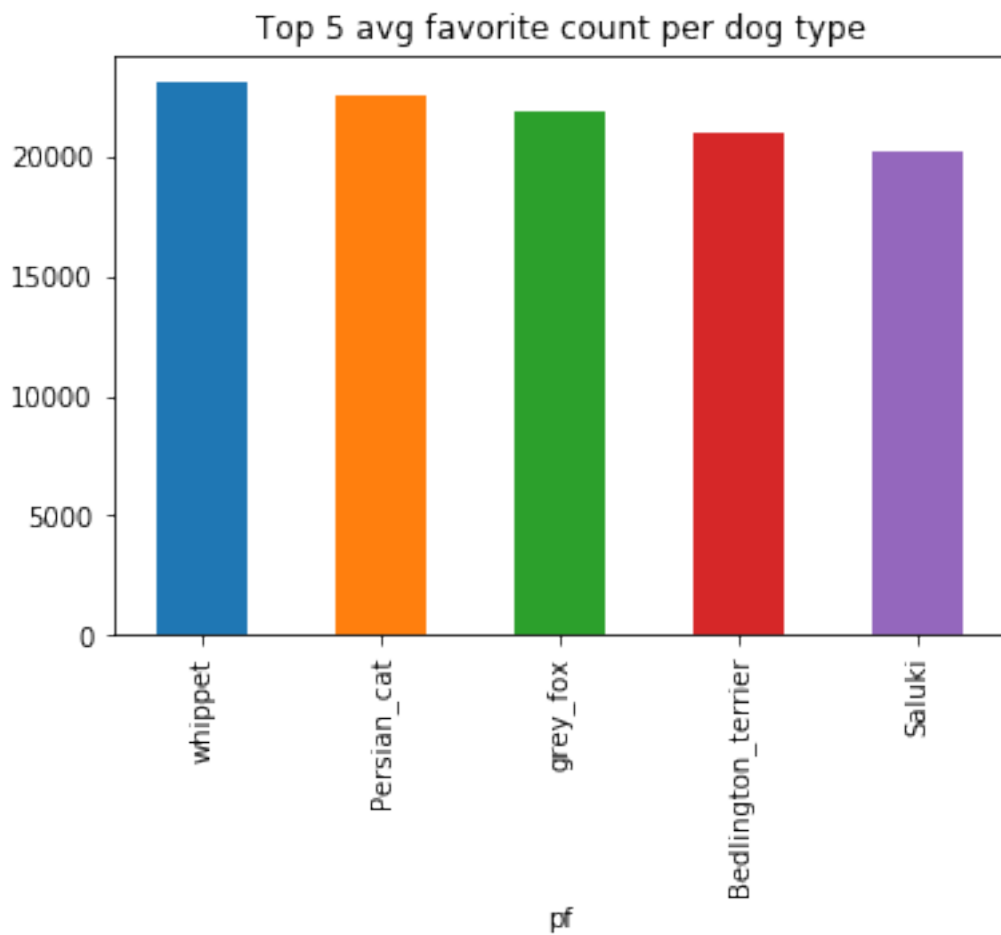
1. Top Average count of 'favorite' by dog type
2. Top Average count of 'favorite' by dog noun (doggo, floofer ...)
3. Top Average rating by dog type

## 1.7.2 Visualization

### Top 5 Average count of 'favorite' by dog type

```
In [257]: #filter data to get it
          df_vis = df_join.groupby(['pf']).favorite_count.mean().nlargest(5)

In [262]: df_vis.plot(kind='bar',title = 'Top 5 avg favorite count per dog type');
```



```
In [ ]:
```