wrangle_act

September 20, 2018

1 Data wrangling WeRateDogs by Kamal Chahal

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```

Introduction
    There are sources form data - twitter data , image data and archive data. The dataset is the tweet archive of Twitter user @dog_rates, also known as WeRateDogs. The goal of this project is to wrangle the WeRateDogs Twitter data to create analyses and visualizations.recommended steps are gather, assess and clean the Twitter data for a analysis and visualization.

2 Gathering data

```
In [1]: # import all important libraries
        import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns
        %matplotlib inline
        import datetime as dt
        import json
        import re
        import requests
        import tweepy
        import os
        import csv
```

```
In [2]: # importing twitter archived data as df dataframe.
        df = pd.read_csv('twitter-archive-enhanced2.txt')
        df.head(2)

Out[2]:         tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
        0  892420643555336193                    NaN                  NaN
        1  892177421306343426                    NaN                  NaN

                        timestamp  \
        0  2017-08-01 16:23:56 +0000
        1  2017-08-01 00:17:27 +0000

                                                     source  \
        0  <a href="http://twitter.com/download/iphone" r...
        1  <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

            retweeted_status_user_id retweeted_status_timestamp  \
        0                       NaN                        NaN
        1                       NaN                        NaN

                                       expanded_urls  rating_numerator  \
        0  https://twitter.com/dog_rates/status/892420643...                13
        1  https://twitter.com/dog_rates/status/892177421...                13

            rating_denominator      name doggo floofer pupper puppo
        0                  10  Phineas  None    None   None  None
        1                  10    Tilly  None    None   None  None

In [3]: df.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 [4]: df

Out[4]:   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

                                                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...
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5      <a href="http://twitter.com/download/iphone" r...
6      <a href="http://twitter.com/download/iphone" r...
7      <a href="http://twitter.com/download/iphone" r...
8      <a href="http://twitter.com/download/iphone" r...
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10     <a href="http://twitter.com/download/iphone" r...
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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...
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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...
```

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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/ws2AMaNwPW                    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
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[2356 rows x 17 columns]
```

In [5]:
```python
# passing API authorization passwords . i have struggled for this API data due to errors
#Query the Twitter API for each tweet's JSON data using Python's Tweepy library and stor
auth = tweepy.OAuthHandler('5Uur0mo4ol2kB8yhtZ1VxXS0u', 'h8E7fSpXWiMoBel7G1ZOAeu4Mgru0v0
auth.set_access_token('303562412-ct9aNnUOFQROUKJVn1i1W3Y8omqSewiQWUcRaygB', 'D3qslrbdOU5
api = tweepy.API(auth,
                 parser = tweepy.parsers.JSONParser(),
                 wait_on_rate_limit = True,
                 wait_on_rate_limit_notify = True)
```

In [6]:
```python
# collecting data twitter data by using query from DF( archived twitter data by tweet id
tweet_ids = list(df.tweet_id)

tweet_data = {}
for tweet in tweet_ids:
    try:
        tweet_status = api.get_status(tweet,
                                      wait_on_rate_limit=True,
                                      wait_on_rate_limit_notify=True)
        tweet_data[str(tweet)] = tweet_status._json
    except:
        print("Error for: " + str(tweet))
```

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```
In [7]: # Programmatically download the dog image prediction files from Udacity server using Req

        folder_name = 'image_predictions'
        if not os.path.exists(folder_name):
            os.makedirs(folder_name)

        url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predictio
        response = requests.get(url)
        response

        with open(os.path.join(folder_name,
                               url.split('/')[-1]), mode='wb') as file:
            file.write(response.content)
```

```
In [8]: # using resource lookup from : https://stackabuse.com/reading-and-writing-json-to-a-file
        # saving twitter data in tweet_json.txt

        import json

        with open('tweet_json.txt', 'w') as outfile:
            json.dump(tweet_data, outfile,
                      sort_keys = True,
                      indent=4,
                      ensure_ascii = False)
```

3   Assessing Data

Step 1 - assess data visually and programmatically for quality and tidiness issues.
   Step 2 Document at least eight (8) quality issues and two (2) tidiness issues

```
In [8]: # reading the dog image table , which was saved after pulling the data from udacity requ

        images = pd.read_table('image_predictions/image-predictions.tsv',
                               sep='\t')
```

4   reading Tweets data

```
In [9]: # reading the twitter data
        df_tweets= pd.read_json('tweet_json.txt',orient='index')
```

```
In [10]: # reading 5 top head rows of twitter data
         df_tweets
```

```
Out[10]:                                 contributors  coordinates       created_at  \
        1991-02-08 13:48:08.022790149            NaN          NaN 2015-11-15 22:32:08
        1991-02-08 16:08:05.002620928            NaN          NaN 2015-11-15 23:05:30
        1991-02-08 17:16:52.701032449            NaN          NaN 2015-11-15 23:21:54
        1991-02-08 20:17:06.329800704            NaN          NaN 2015-11-16 00:04:52
        1991-02-08 21:40:48.165822465            NaN          NaN 2015-11-16 00:24:50
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1998-03-24 08:46:21.411237888    <a href="http://twitter.com/download/iphone" r...
1998-03-27 04:11:53.173991426    <a href="http://twitter.com/download/iphone" r...
1998-03-28 12:25:50.875897856    <a href="http://twitter.com/download/iphone" r...
```

```
1998-03-31 06:59:18.926688256    <a href="http://twitter.com/download/iphone" r...
1998-04-04 11:32:37.279858688    <a href="http://twitter.com/download/iphone" r...
1998-04-05 22:26:21.378084864    <a href="http://twitter.com/download/iphone" r...
1998-04-10 03:03:41.306343426    <a href="http://twitter.com/download/iphone" r...
1998-04-12 22:37:23.555336193    <a href="http://twitter.com/download/iphone" r...


                                                                      text  \
1991-02-08 13:48:08.022790149    Here we have a Japanese Irish Setter. Lost eye...
1991-02-08 16:08:05.002620928    This is a western brown Mitsubishi terrier. Up...
1991-02-08 17:16:52.701032449    Here is a very happy pup. Big fan of well-main...
1991-02-08 20:17:06.329800704    This is a purebred Piers Morgan. Loves to Netf...
1991-02-08 21:40:48.165822465    Here we have a 1949 1st generation vulpix. Enj...
1991-02-08 22:05:58.794694657    This is a truly beautiful English Wilson Staff...
1991-02-08 22:24:13.826850816    This is an odd dog. Hard on the outside but lo...
1991-02-08 23:25:25.042405380    Here is a Siberian heavily armored polar bear ...
1991-02-08 23:51:30.499244032    My oh my. This is a rare blond Canadian terrie...
1991-02-09 00:16:40.524156928    Here is the Rand Paul of retrievers folks! He'...
1991-02-09 01:43:47.256086533    This is the happiest dog you will ever see. Ve...
1991-02-09 03:46:33.221509120    Here we have a northern speckled Rhododendron...
1991-02-09 04:18:20.786774016    Let's hope this flight isn't Malaysian (lol). ...
1991-02-09 07:01:56.733198337    Here we have a well-established sunblockerspan...
1991-02-09 10:06:40.022159362    This appears to be a Mongolian Presbyterian mi...
1991-02-09 11:38:33.787052032    Can stand on stump for what seems like a while...
1991-02-09 12:22:35.909144576    Oh my. Here you are seeing an Adobe Setter giv...
1991-02-09 12:55:33.288665088    Not familiar with this breed. No tail (weird)...
1991-02-11 10:41:50.803644416    Very concerned about fellow dog trapped in com...
1991-02-11 11:51:37.616637952        Can take selfies 11/10 https://t.co/ws2AMaNwPW
1991-02-11 15:50:06.224695296    This is an Albanian 3 1/2 legged  Episcopalian...
1991-02-11 17:38:31.632134144    This is a funny dog. Weird toes. Won't come do...
1991-02-12 05:51:22.303524864    This is an extremely rare horned Parthenon. No...
1991-02-12 07:56:57.576210432    Look at this jokester thinking seat belt laws ...
1991-02-12 10:08:08.456101888    Here we have a mixed Asiago from the Galpagos...
1991-02-12 12:45:58.909284353    Unique dog here. Very small. Lives in containe...
1991-02-12 15:49:13.744588802    Those are sunglasses and a jean jacket. 11/10 ...
1991-02-12 22:04:07.373291520    Oh goodness. A super rare northeast Qdoba kang...
1991-02-13 01:05:26.856765440    This is a southern Vesuvius bumblegruff. Can d...
1991-02-13 02:18:27.551481857    This is quite the dog. Gets really excited whe...
...                                                                        ...
1998-01-31 17:16:49.285017600    @NonWhiteHat @MayhewMayhem omg hello tanner yo...
1998-02-01 20:49:04.734445568    This is Roscoe. Another pupper fallen victim t...
1998-02-05 12:05:36.477933568    This is Derek. He's late for a dog meeting. 13...
1998-02-06 03:48:00.519319552    This is Mingus. He's a wonderful father to his...
1998-02-09 00:13:53.522544640    This is Maya. She's very shy. Rarely leaves he...
1998-02-10 09:03:12.804085760    This... is a Jubilant Antarctic House Bear. We...
1998-02-13 04:13:37.045368832    You may not have known you needed to see this ...
1998-02-14 16:32:37.103951883    This is Canela. She attempted some fancy porch...
1998-02-15 04:32:19.158093824    I've yet to rate a Venezuelan Hover Wiener. Th...
1998-02-17 08:48:09.381826560    This is Jeffrey. He has a monopoly on the pool...
```

```
1998-02-21 16:27:14.458587136    This is Gerald. He was just told he didn't get...
1998-02-27 04:49:22.724278272    This is Ralphus. He's powering up. Attempting ...
1998-03-02 02:16:29.199671297    This is Zeke. He has a new stick. Very proud o...
1998-03-03 09:27:18.123831296    This is Jim. He found a fren. Taught him how t...
1998-03-07 13:54:01.981685760    This is Oliver. You're witnessing one of his m...
1998-03-10 11:58:55.344209921    This is Stuart. He's sporting his favorite fan...
1998-03-11 17:53:57.579907072    This is Ted. He does his best. Sometimes that'...
1998-03-12 01:16:28.333682689    Here's a puppo that seems to be on the fence a...
1998-03-14 13:08:16.479866881    This is Bruno. He is a service shark. Only get...
1998-03-16 00:03:28.113172480    This is Koda. He is a South Australian decksha...
1998-03-18 16:57:35.349198849    This is Cassie. She is a college pup. Studying...
1998-03-22 23:26:25.150312448    This is Zoey. She doesn't want to be one of th...
1998-03-24 08:46:21.411237888    When you watch your owner call another dog a g...
1998-03-27 04:11:53.173991426    Meet Jax. He enjoys ice cream so much he gets ...
1998-03-28 12:25:50.875897856    Here we have a majestic great white breaching ...
1998-03-31 06:59:18.926688256    This is Franklin. He would like you to stop ca...
1998-04-04 11:32:37.279858688    This is Darla. She commenced a snooze mid meal...
1998-04-05 22:26:21.378084864    This is Archie. He is a rare Norwegian Pouncin...
1998-04-10 03:03:41.306343426    This is Tilly. She's just checking pup on you...
1998-04-12 22:37:23.555336193    This is Phineas. He's a mystical boy. Only eve...

                                 truncated  \
1991-02-08 13:48:08.022790149            0
1991-02-08 16:08:05.002620928            0
1991-02-08 17:16:52.701032449            0
1991-02-08 20:17:06.329800704            0
1991-02-08 21:40:48.165822465            0
1991-02-08 22:05:58.794694657            0
1991-02-08 22:24:13.826850816            0
1991-02-08 23:25:25.042405380            0
1991-02-08 23:51:30.499244032            0
1991-02-09 00:16:40.524156928            0
1991-02-09 01:43:47.256086533            0
1991-02-09 03:46:33.221509120            0
1991-02-09 04:18:20.786774016            0
1991-02-09 07:01:56.733198337            0
1991-02-09 10:06:40.022159362            0
1991-02-09 11:38:33.787052032            0
1991-02-09 12:22:35.909144576            0
1991-02-09 12:55:33.288665088            0
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1991-02-11 11:51:37.616637952            0
1991-02-11 15:50:06.224695296            0
1991-02-11 17:38:31.632134144            0
1991-02-12 05:51:22.303524864            0
1991-02-12 07:56:57.576210432            0
1991-02-12 10:08:08.456101888            0
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1991-02-13 01:05:26.856765440            0
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...                                    ...
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1998-02-01 20:49:04.734445568            1
1998-02-05 12:05:36.477933568            0
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1998-02-09 00:13:53.522544640            0
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1998-02-13 04:13:37.045368832            0
1998-02-14 16:32:37.103951883            0
1998-02-15 04:32:19.158093824            0
1998-02-17 08:48:09.381826560            1
1998-02-21 16:27:14.458587136            1
1998-02-27 04:49:22.724278272            0
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1998-03-03 09:27:18.123831296            0
1998-03-07 13:54:01.981685760            1
1998-03-10 11:58:55.344209921            1
1998-03-11 17:53:57.579907072            0
1998-03-12 01:16:28.333682689            0
1998-03-14 13:08:16.479866881            0
1998-03-16 00:03:28.113172480            1
1998-03-18 16:57:35.349198849            1
1998-03-22 23:26:25.150312448            1
1998-03-24 08:46:21.411237888            1
1998-03-27 04:11:53.173991426            1
1998-03-28 12:25:50.875897856            1
1998-03-31 06:59:18.926688256            1
1998-04-04 11:32:37.279858688            0
1998-04-05 22:26:21.378084864            1
1998-04-10 03:03:41.306343426            1
1998-04-12 22:37:23.555336193            0


                                                                         user
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1991-02-09 04:18:20.786774016   {'contributors_enabled': False, 'created_at': ...
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1991-02-09 10:06:40.022159362   {'contributors_enabled': False, 'created_at': ...
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1991-02-09 12:22:35.909144576   {'contributors_enabled': False, 'created_at': ...
1991-02-09 12:55:33.288665088   {'contributors_enabled': False, 'created_at': ...
1991-02-11 10:41:50.803644416   {'contributors_enabled': False, 'created_at': ...
1991-02-11 11:51:37.616637952   {'contributors_enabled': False, 'created_at': ...
1991-02-11 15:50:06.224695296   {'contributors_enabled': False, 'created_at': ...
1991-02-11 17:38:31.632134144   {'contributors_enabled': False, 'created_at': ...
1991-02-12 05:51:22.303524864   {'contributors_enabled': False, 'created_at': ...
1991-02-12 07:56:57.576210432   {'contributors_enabled': False, 'created_at': ...
1991-02-12 10:08:08.456101888   {'contributors_enabled': False, 'created_at': ...
1991-02-12 12:45:58.909284353   {'contributors_enabled': False, 'created_at': ...
1991-02-12 15:49:13.744588802   {'contributors_enabled': False, 'created_at': ...
1991-02-12 22:04:07.373291520   {'contributors_enabled': False, 'created_at': ...
1991-02-13 01:05:26.856765440   {'contributors_enabled': False, 'created_at': ...
1991-02-13 02:18:27.551481857   {'contributors_enabled': False, 'created_at': ...
...                             ...
1998-01-31 17:16:49.285017600   {'contributors_enabled': False, 'created_at': ...
1998-02-01 20:49:04.734445568   {'contributors_enabled': False, 'created_at': ...
1998-02-05 12:05:36.477933568   {'contributors_enabled': False, 'created_at': ...
1998-02-06 03:48:00.519319552   {'contributors_enabled': False, 'created_at': ...
1998-02-09 00:13:53.522544640   {'contributors_enabled': False, 'created_at': ...
1998-02-10 09:03:12.804085760   {'contributors_enabled': False, 'created_at': ...
1998-02-13 04:13:37.045368832   {'contributors_enabled': False, 'created_at': ...
1998-02-14 16:32:37.103951883   {'contributors_enabled': False, 'created_at': ...
1998-02-15 04:32:19.158093824   {'contributors_enabled': False, 'created_at': ...
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1998-02-21 16:27:14.458587136   {'contributors_enabled': False, 'created_at': ...
1998-02-27 04:49:22.724278272   {'contributors_enabled': False, 'created_at': ...
1998-03-02 02:16:29.199671297   {'contributors_enabled': False, 'created_at': ...
1998-03-03 09:27:18.123831296   {'contributors_enabled': False, 'created_at': ...
1998-03-07 13:54:01.981685760   {'contributors_enabled': False, 'created_at': ...
1998-03-10 11:58:55.344209921   {'contributors_enabled': False, 'created_at': ...
1998-03-11 17:53:57.579907072   {'contributors_enabled': False, 'created_at': ...
1998-03-12 01:16:28.333682689   {'contributors_enabled': False, 'created_at': ...
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1998-03-16 00:03:28.113172480   {'contributors_enabled': False, 'created_at': ...
1998-03-18 16:57:35.349198849   {'contributors_enabled': False, 'created_at': ...
1998-03-22 23:26:25.150312448   {'contributors_enabled': False, 'created_at': ...
1998-03-24 08:46:21.411237888   {'contributors_enabled': False, 'created_at': ...
1998-03-27 04:11:53.173991426   {'contributors_enabled': False, 'created_at': ...
1998-03-28 12:25:50.875897856   {'contributors_enabled': False, 'created_at': ...
1998-03-31 06:59:18.926688256   {'contributors_enabled': False, 'created_at': ...
1998-04-04 11:32:37.279858688   {'contributors_enabled': False, 'created_at': ...
1998-04-05 22:26:21.378084864   {'contributors_enabled': False, 'created_at': ...
```

```
         1998-04-10 03:03:41.306343426  {'contributors_enabled': False, 'created_at': ...
         1998-04-12 22:37:23.555336193  {'contributors_enabled': False, 'created_at': ...

         [2350 rows x 30 columns]
```

In [11]: df_tweets.info()

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2350 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 30 columns):
contributors                   0 non-null float64
coordinates                    0 non-null float64
created_at                     2350 non-null datetime64[ns]
entities                       2350 non-null object
extended_entities              1826 non-null object
favorite_count                 2350 non-null int64
favorited                      2350 non-null int64
geo                            0 non-null float64
id                             2350 non-null int64
id_str                         2350 non-null int64
in_reply_to_screen_name        78 non-null object
in_reply_to_status_id          78 non-null float64
in_reply_to_status_id_str      78 non-null float64
in_reply_to_user_id            78 non-null float64
in_reply_to_user_id_str        78 non-null float64
is_quote_status                2350 non-null int64
lang                           2350 non-null object
place                          1 non-null object
possibly_sensitive             2209 non-null float64
possibly_sensitive_appealable  2209 non-null float64
quoted_status                  27 non-null object
quoted_status_id               28 non-null float64
quoted_status_id_str           28 non-null float64
retweet_count                  2350 non-null int64
retweeted                      2350 non-null int64
retweeted_status               175 non-null object
source                         2350 non-null object
text                           2350 non-null object
truncated                      2350 non-null int64
user                           2350 non-null object
dtypes: datetime64[ns](1), float64(11), int64(8), object(10)
memory usage: 569.1+ KB
```

In [12]: df_tweets.source.value_counts()

Out[12]: Twitter for iPhone
         Vine - Make a Scene
         Twitter Web Client

```
          <a href="https://about.twitter.com/products/tweetdeck" rel="nofollow">TweetDeck</a>
          Name: source, dtype: int64

In [13]:  # reading twitter archived data from df dataframe. displaying top 5 rows .

          df.head()

Out[13]:              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
```

In [14]: df.rating_denominator.value_counts()

Out[14]: 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 [15]: print(df.loc[df.rating_denominator == 11, 'text'])
         print(df.loc[df.rating_denominator == 2, 'text'])

784   RT @dog_rates: After so many requests, this is...
1068   After so many requests, this is Bretagne. She ...
1662   This is Darrel. He just robbed a 7/11 and is i...
Name: text, dtype: object
2335   This is an Albanian 3 1/2 legged Episcopalian...
Name: text, dtype: object

In [16]: print(df['text'][784]) #@RT indicates retweeted and after clean - those tweets will be
         print(df['text'][1068]) #rating is 14/10. last surviving 9/11 search dog .
         print(df['text'][1662]) #rated as 10/10 and it is spotted by helicopter in high speed p
         print(df['text'][2335]) #3 1/2 legged dog and rating is 9/10 .

RT @dog_rates: After so many requests, this is Bretagne. She was the last surviving 9/11 search
After so many requests, this is Bretagne. She was the last surviving 9/11 search dog, and our se
This is Darrel. He just robbed a 7/11 and is in a high speed police chase. Was just spotted by t
```

This is an Albanian 3 1/2 legged Episcopalian. Loves well-polished hardwood flooring. Penis on

```
In [17]: df.rating_numerator.value_counts()

Out[17]: 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 [18]: sum(df['tweet_id'].duplicated())
```

```
Out[18]: 0

In [19]: print(df.loc[df.rating_numerator == 204, 'text'])
         print(df.loc[df.rating_numerator == 143, 'text'])

1120    Say hello to this unbelievably well behaved sq...
Name: text, dtype: object
1634    Two sneaky puppers were not initially seen, mo...
Name: text, dtype: object


In [20]: print(df.loc[df.rating_numerator == 666, 'text'])

189    @s8n You tried very hard to portray this good ...
Name: text, dtype: object


In [21]: # verify numerators and denominators
         print(df['text'][1120])#17 dogs in total from link.
         print(df['text'][1634]) #11 dogs+ Two sneaky puppers=13 dogs
         print(df['text'][189]) #no pics

Say hello to this unbelievably well behaved squad of doggos. 204/170 would try to pet all at onc
Two sneaky puppers were not initially seen, moving the rating to 143/130. Please forgive us. Tha
@s8n You tried very hard to portray this good boy as not so good, but you have ultimately failed


In [22]: # reading dog image data  from image dataframe. displaying top 5 rows .

         images.head()

Out[22]:              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                 p2  \
         0        1  Welsh_springer_spaniel  0.465074    True             collie
         1        1                 redbone  0.506826    True  miniature_pinscher
         2        1         German_shepherd  0.596461    True           malinois
         3        1     Rhodesian_ridgeback  0.408143    True            redbone
         4        1      miniature_pinscher  0.560311    True         Rottweiler

            p2_conf  p2_dog                  p3   p3_conf  p3_dog
         0  0.156665    True     Shetland_sheepdog  0.061428    True
         1  0.074192    True  Rhodesian_ridgeback  0.072010    True
         2  0.138584    True           bloodhound  0.116197    True
         3  0.360687    True   miniature_pinscher  0.222752    True
         4  0.243682    True             Doberman  0.154629    True
```

```
In [23]: # using info command on dataframe , below displaying which columns have null values and
         #it become easy to decide which column should be dropped from our analysis.
         #for examples - in_reply_to_status_id ,in_reply_to_user_id etc
         df.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 [24]: # using info command on dataframe , below displaying which columns have null values and
         #it become easy to decide which column should be dropped from our analysis.
         #for examples - geo ,coordinates,in_reply_to_status_id,place etc
         df_tweets.info()

<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2350 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 30 columns):
contributors             0 non-null float64
coordinates              0 non-null float64
created_at               2350 non-null datetime64[ns]
entities                 2350 non-null object
extended_entities        1826 non-null object
favorite_count           2350 non-null int64
favorited                2350 non-null int64
geo                      0 non-null float64
id                       2350 non-null int64
id_str                   2350 non-null int64
in_reply_to_screen_name  78 non-null object
```

```
in_reply_to_status_id              78 non-null float64
in_reply_to_status_id_str          78 non-null float64
in_reply_to_user_id                78 non-null float64
in_reply_to_user_id_str            78 non-null float64
is_quote_status                    2350 non-null int64
lang                               2350 non-null object
place                              1 non-null object
possibly_sensitive                 2209 non-null float64
possibly_sensitive_appealable      2209 non-null float64
quoted_status                      27 non-null object
quoted_status_id                   28 non-null float64
quoted_status_id_str               28 non-null float64
retweet_count                      2350 non-null int64
retweeted                          2350 non-null int64
retweeted_status                   175 non-null object
source                             2350 non-null object
text                               2350 non-null object
truncated                          2350 non-null int64
user                               2350 non-null object
dtypes: datetime64[ns](1), float64(11), int64(8), object(10)
memory usage: 569.1+ KB
```

In [25]: # using info command on dataframe , below displaying which columns have null values and
         #it become easy to decide which column should be dropped from our analysis.
         # examples - alll columns have 2075 nn null values so all of the columns hold equal val

         images.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 [26]: sum(images.jpg_url.duplicated())

```
Out[26]: 66

In [27]: pd.concat(g for _, g in images.groupby("jpg_url") if len(g) > 1)

Out[27]:            tweet_id                                           jpg_url   \
         480   675354435921575936   https://pbs.twimg.com/ext_tw_video_thumb/67535...
         1297  752309394570878976   https://pbs.twimg.com/ext_tw_video_thumb/67535...
         1641  807106840509214720   https://pbs.twimg.com/ext_tw_video_thumb/80710...
         1864  842892208864923648   https://pbs.twimg.com/ext_tw_video_thumb/80710...
         1691  815966073409433600   https://pbs.twimg.com/ext_tw_video_thumb/81596...
         1703  817181837579653120   https://pbs.twimg.com/ext_tw_video_thumb/81596...
         1705  817423860136083457   https://pbs.twimg.com/ext_tw_video_thumb/81742...
         1858  841833993020538882   https://pbs.twimg.com/ext_tw_video_thumb/81742...
         1715  819004803107983360    https://pbs.twimg.com/media/C12whDoVEAALRxa.jpg
         1718  819015337530290176    https://pbs.twimg.com/media/C12whDoVEAALRxa.jpg
         1716  819006400881917954    https://pbs.twimg.com/media/C12x-JTVIAAzdfl.jpg
         1717  819015331746349057    https://pbs.twimg.com/media/C12x-JTVIAAzdfl.jpg
         1738  822244816520155136    https://pbs.twimg.com/media/C2kzTGxWEAEOpPL.jpg
         1746  823269594223824897    https://pbs.twimg.com/media/C2kzTGxWEAEOpPL.jpg
         1740  822489057087389700    https://pbs.twimg.com/media/C2oRbOuWEAAbVSl.jpg
         1742  822647212903690241    https://pbs.twimg.com/media/C2oRbOuWEAAbVSl.jpg
         1767  826958653328592898    https://pbs.twimg.com/media/C3nygbBWQAAjwcW.jpg
         1789  829878982036299777    https://pbs.twimg.com/media/C3nygbBWQAAjwcW.jpg
         1785  829374341691346946    https://pbs.twimg.com/media/C4KHj-nWQAA3poV.jpg
         1903  851953902622658560    https://pbs.twimg.com/media/C4KHj-nWQAA3poV.jpg
         1791  830583320585068544    https://pbs.twimg.com/media/C4bTH6nWMAAX_bJ.jpg
         2041  885311592912609280    https://pbs.twimg.com/media/C4bTH6nWMAAX_bJ.jpg
         224   670319130621435904    https://pbs.twimg.com/media/CU1zsMSUAAASOqW.jpg
         1345  759159934323924993    https://pbs.twimg.com/media/CU1zsMSUAAASOqW.jpg
         241   670444955656130560    https://pbs.twimg.com/media/CU3mITUWIAAfyQS.jpg
         1590  798644042770751489    https://pbs.twimg.com/media/CU3mITUWIAAfyQS.jpg
         85    667509364010450944    https://pbs.twimg.com/media/CUN4Or5UAAAa5K4.jpg
         1589  798628517273620480    https://pbs.twimg.com/media/CUN4Or5UAAAa5K4.jpg
         327   671896809300709376    https://pbs.twimg.com/media/CVMOlMiWwAA4Yxl.jpg
         1591  798665375516884993    https://pbs.twimg.com/media/CVMOlMiWwAA4Yxl.jpg
         ...          ...                                             ...
         1530  789530877013393408    https://pbs.twimg.com/media/CvT6IV6WEAQhhV5.jpg
         1571  794983741416415232    https://pbs.twimg.com/media/CvT6IV6WEAQhhV5.jpg
         1533  789986466051088384    https://pbs.twimg.com/media/CvaYgDOWgAEfjls.jpg
         1538  790723298204217344    https://pbs.twimg.com/media/CvaYgDOWgAEfjls.jpg
         1534  790277117346975746    https://pbs.twimg.com/media/Cveg1-NXgAASaaT.jpg
         1683  813944609378369540    https://pbs.twimg.com/media/Cveg1-NXgAASaaT.jpg
         1539  790946055508652032    https://pbs.twimg.com/media/CvoBPWRWgAA4het.jpg
         1699  816829038950027264    https://pbs.twimg.com/media/CvoBPWRWgAA4het.jpg
         1544  791672322847637504    https://pbs.twimg.com/media/CvyVxQRWEAAdSZS.jpg
         1564  793614319594401792    https://pbs.twimg.com/media/CvyVxQRWEAAdSZS.jpg
         1561  793286476301799424    https://pbs.twimg.com/media/CwJR1okWIAA6XMp.jpg
         1804  832215726631055365    https://pbs.twimg.com/media/CwJR1okWIAA6XMp.jpg
```

```
1566  793962221541933056        https://pbs.twimg.com/media/CwS4aqZXUAAe3IO.jpg
1652  809808892968534016        https://pbs.twimg.com/media/CwS4aqZXUAAe3IO.jpg
1572  795076730285391872        https://pbs.twimg.com/media/CwiuEJmW8AAZnit.jpg
1755  824796380199809024        https://pbs.twimg.com/media/CwiuEJmW8AAZnit.jpg
1578  796149749086875649        https://pbs.twimg.com/media/Cwx99rpW8AMk_Ie.jpg
1579  796177847564038144        https://pbs.twimg.com/media/Cwx99rpW8AMk_Ie.jpg
1610  801167903437357056        https://pbs.twimg.com/media/Cx5R8wPVEAALa9r.jpg
1645  808134635716833280        https://pbs.twimg.com/media/Cx5R8wPVEAALa9r.jpg
1603  800141422401830912        https://pbs.twimg.com/media/CxqsX-8XUAAEvjD.jpg
1727  820446719150292993        https://pbs.twimg.com/media/CxqsX-8XUAAEvjD.jpg
1638  806629075125202948        https://pbs.twimg.com/media/CzG425nWgAAnP7P.jpg
1944  861769973181624320        https://pbs.twimg.com/media/CzG425nWgAAnP7P.jpg
1970  868880397819494401        https://pbs.twimg.com/media/DA7iHL5UOAA1OQo.jpg
1992  873697596434513921        https://pbs.twimg.com/media/DA7iHL5UOAA1OQo.jpg
2051  887473957103951883        https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
2055  888202515573088257        https://pbs.twimg.com/media/DFDw2tyUQAAAFke.jpg
1033  711694788429553666        https://pbs.twimg.com/tweet_video_thumb/CeBym7...
1364  761371037149827077        https://pbs.twimg.com/tweet_video_thumb/CeBym7...

      img_num                          p1    p1_conf  p1_dog  \
480         1                     upright   0.303415   False
1297        1                     upright   0.303415   False
1641        1                   Chihuahua   0.505370    True
1864        1                   Chihuahua   0.505370    True
1691        1              Tibetan_mastiff  0.506312    True
1703        1              Tibetan_mastiff  0.506312    True
1705        1                    ice_bear   0.336200   False
1858        1                    ice_bear   0.336200   False
1715        1             standard_poodle   0.351308    True
1718        1             standard_poodle   0.351308    True
1716        4                      prison   0.907083   False
1717        4                      prison   0.907083   False
1738        1                     Samoyed   0.585441    True
1746        1                     Samoyed   0.585441    True
1740        1                     Samoyed   0.416769    True
1742        1                     Samoyed   0.416769    True
1767        1            golden_retriever   0.617389    True
1789        1            golden_retriever   0.617389    True
1785        1   Staffordshire_bullterrier  0.757547    True
1903        1   Staffordshire_bullterrier  0.757547    True
1791        1          Labrador_retriever   0.908703    True
2041        1          Labrador_retriever   0.908703    True
224         1               Irish_terrier   0.254856    True
1345        1               Irish_terrier   0.254856    True
241         1             English_springer  0.403698   True
1590        1             English_springer  0.403698   True
85          1                      beagle   0.636169    True
1589        1                      beagle   0.636169    True
```

```
327        1                         chow  0.243529   True
1591       1                         chow  0.243529   True
...      ...                          ...       ...    ...
1530       3                    schipperke  0.363272   True
1571       3                    schipperke  0.363272   True
1533       1                           tub  0.479477  False
1538       1                           tub  0.479477  False
1534       1            Labrador_retriever  0.427742   True
1683       1            Labrador_retriever  0.427742   True
1539       1                     dishwasher  0.700466  False
1699       1                     dishwasher  0.700466  False
1544       1              golden_retriever  0.705092   True
1564       1              golden_retriever  0.705092   True
1561       1                   Afghan_hound  0.274637   True
1804       1                   Afghan_hound  0.274637   True
1566       1            Labrador_retriever  0.861651   True
1652       1            Labrador_retriever  0.861651   True
1572       2                      gas_pump  0.676439  False
1755       2                      gas_pump  0.676439  False
1578       1              golden_retriever  0.600276   True
1579       1              golden_retriever  0.600276   True
1610       1                cocker_spaniel  0.740220   True
1645       1                cocker_spaniel  0.740220   True
1603       3              golden_retriever  0.938048   True
1727       3              golden_retriever  0.938048   True
1638       2                  Arabian_camel  0.366248  False
1944       2                  Arabian_camel  0.366248  False
1970       1                        laptop  0.153718  False
1992       1                        laptop  0.153718  False
2051       2                      Pembroke  0.809197   True
2055       2                      Pembroke  0.809197   True
1033       1                    brown_bear  0.713293  False
1364       1                    brown_bear  0.713293  False

                            p2    p2_conf  p2_dog  \
480          golden_retriever   0.181351    True
1297         golden_retriever   0.181351    True
1641                Pomeranian   0.120358    True
1864                Pomeranian   0.120358    True
1691            Tibetan_terrier  0.295690    True
1703            Tibetan_terrier  0.295690    True
1705                   Samoyed   0.201358    True
1858                   Samoyed   0.201358    True
1715                 toy_poodle  0.271929    True
1718                 toy_poodle  0.271929    True
1716                     palace  0.020089   False
1717                     palace  0.020089   False
1738                Pomeranian   0.193654    True
```

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```
1746                         Pomeranian  0.193654    True
1740                           malamute  0.252706    True
1742                           malamute  0.252706    True
1767                  Labrador_retriever  0.337053    True
1789                  Labrador_retriever  0.337053    True
1785     American_Staffordshire_terrier  0.149950    True
1903     American_Staffordshire_terrier  0.149950    True
1791                          seat_belt  0.057091   False
2041                          seat_belt  0.057091   False
224                              briard  0.227716    True
1345                             briard  0.227716    True
241                     Brittany_spaniel  0.347609    True
1590                    Brittany_spaniel  0.347609    True
85                   Labrador_retriever  0.119256    True
1589                  Labrador_retriever  0.119256    True
327                             hamster  0.227150   False
1591                            hamster  0.227150   False
...                                 ...       ...     ...
1530                             kelpie  0.197021    True
1571                             kelpie  0.197021    True
1533                            bathtub  0.325106   False
1538                            bathtub  0.325106   False
1534                          Great_Dane  0.190503    True
1683                          Great_Dane  0.190503    True
1539                   golden_retriever  0.245773    True
1699                   golden_retriever  0.245773    True
1544                 Labrador_retriever  0.219721    True
1564                 Labrador_retriever  0.219721    True
1561                              borzoi  0.142204    True
1804                              borzoi  0.142204    True
1566                   golden_retriever  0.044462    True
1652                   golden_retriever  0.044462    True
1572                           harvester  0.049995   False
1755                           harvester  0.049995   False
1578                 Labrador_retriever  0.140798    True
1579                 Labrador_retriever  0.140798    True
1610                      Dandie_Dinmont  0.061604    True
1645                      Dandie_Dinmont  0.061604    True
1603                              kuvasz  0.025119    True
1727                              kuvasz  0.025119    True
1638                         house_finch  0.209852   False
1944                         house_finch  0.209852   False
1970                     French_bulldog  0.099984    True
1992                     French_bulldog  0.099984    True
2051                  Rhodesian_ridgeback  0.054950    True
2055                  Rhodesian_ridgeback  0.054950    True
1033                     Indian_elephant  0.172844   False
1364                     Indian_elephant  0.172844   False
```

	p3	p3_conf	p3_dog
480	Brittany_spaniel	0.162084	True
1297	Brittany_spaniel	0.162084	True
1641	toy_terrier	0.077008	True
1864	toy_terrier	0.077008	True
1691	otterhound	0.036251	True
1703	otterhound	0.036251	True
1705	Eskimo_dog	0.186789	True
1858	Eskimo_dog	0.186789	True
1715	Tibetan_terrier	0.094759	True
1718	Tibetan_terrier	0.094759	True
1716	umbrella	0.007850	False
1717	umbrella	0.007850	False
1738	Arctic_fox	0.071648	False
1746	Arctic_fox	0.071648	False
1740	kuvasz	0.157028	True
1742	kuvasz	0.157028	True
1767	tennis_ball	0.008554	False
1789	tennis_ball	0.008554	False
1785	Chesapeake_Bay_retriever	0.047523	True
1903	Chesapeake_Bay_retriever	0.047523	True
1791	pug	0.011933	True
2041	pug	0.011933	True
224	soft-coated_wheaten_terrier	0.223263	True
1345	soft-coated_wheaten_terrier	0.223263	True
241	Welsh_springer_spaniel	0.137186	True
1590	Welsh_springer_spaniel	0.137186	True
85	golden_retriever	0.082549	True
1589	golden_retriever	0.082549	True
327	Pomeranian	0.056057	True
1591	Pomeranian	0.056057	True
...	...	...	...
1530	Norwegian_elkhound	0.151024	True
1571	Norwegian_elkhound	0.151024	True
1533	golden_retriever	0.078530	True
1538	golden_retriever	0.078530	True
1534	curly-coated_retriever	0.146427	True
1683	curly-coated_retriever	0.146427	True
1539	chow	0.039012	True
1699	chow	0.039012	True
1544	kuvasz	0.015965	True
1564	kuvasz	0.015965	True
1561	doormat	0.109677	False
1804	doormat	0.109677	False
1566	Staffordshire_bullterrier	0.016497	True
1652	Staffordshire_bullterrier	0.016497	True
1572	swing	0.044660	False

```
1755                      swing  0.044660   False
1578                  seat_belt  0.087355   False
1579                  seat_belt  0.087355   False
1610              English_setter  0.041331    True
1645              English_setter  0.041331    True
1603          Labrador_retriever  0.022977    True
1727          Labrador_retriever  0.022977    True
1638              cocker_spaniel  0.046403    True
1944              cocker_spaniel  0.046403    True
1970                    printer  0.077130   False
1992                    printer  0.077130   False
2051                     beagle  0.038915    True
2055                     beagle  0.038915    True
1033               water_buffalo  0.038902   False
1364               water_buffalo  0.038902   False

[132 rows x 12 columns]
```

```
In [28]: images.img_num.value_counts()

Out[28]: 1    1780
         2     198
         3      66
         4      31
         Name: img_num, dtype: int64

In [29]: images.p1_dog.value_counts()

Out[29]: True     1532
         False     543
         Name: p1_dog, dtype: int64

In [30]: images.p2_dog.value_counts()

Out[30]: True     1553
         False     522
         Name: p2_dog, dtype: int64

In [31]: images.p3_dog.value_counts()

Out[31]: True     1499
         False     576
         Name: p3_dog, dtype: int64
```

5   Step 1 - highlight Quality Issues-

1. retweet issue - remove any tweets - that being retweeted , finding the rows and deleting them from dataframe using important columns retweeted_status and retweet_count. these columns provides significant info about retweets.

2. 181 records have retweeted_status_id in dataframe archied twitter data.whuich need to be exculded from dataset.
3. renaming the image predictions table columns - p1 , p2,p3 by removing (_).
4. name of the dogs mispelled or missing in twitter archived dataframe(df).
5. renaming the id column to tweet_id for cross reference across 2 other tables.
6. retweeted_status= 175 records needs to be exculded from df_tweets dataframe.
7. The numerator and denominator columns have unusual values and it should be in float values.
8. null values are not treated as null values in som of the columns. 9 . jpg_url drop duplicated values .
9. Drop columns that are not needed as shown by null values examples. 11.tweet_id needs to convert number to string . 12.Rating should be in float values for df dataframe . 13 .convert id column from a number to a string in df_tweets dataframe. 14.indexing the df_tweets table using the tweet_id instead of id .

6   step 2 -highlight Tidyness Issues

1. parse the datetime information into seperate columns
2. Date and Time columns need to be converted to datetime objects 3.Remove unnecessary columns and keep following columns after renaming them : tweet_id, retweet count, favorite count,text 4.join all tables into single dataset .

7   Data cleaning

```
In [32]: # Before cleaning - making a copy of the dataframes .
         df_clean = df.copy() # Archived twitter data
         images_clean = images.copy() # dog images data
         df_tweets_clean = df_tweets.copy() # twitter API data cleanup
```

8   Starting with Df_clean dataframe (which is archived twitter dataset)

9   Defining the 3 step approach for cleaning the data - define , code and test .

10   Define -

exlude tweets that have a retweeted_status as theose are retweeted .

11   Code - to do cleaning by programming

```
In [33]: df_clean[df_clean['retweeted_status_id'].notnull()==True]
         # there are 181 tweets which are retweets by the retweeted

Out[33]:                    tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
         19    888202515573088257                    NaN                  NaN
```

32	886054160059072513	NaN	NaN
36	885311592912609280	NaN	NaN
68	879130579576475649	NaN	NaN
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885    2016-08-01 16:43:19 +0000
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911    2016-07-25 15:26:30 +0000
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2260   <a href="http://twitter.com" rel="nofollow">Tw...

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19    RT @dog_rates: This is Canela. She attempted s...        8.874740e+17
32    RT @Athletics: 12/10 #BATP https://t.co/WxwJmv...        8.860537e+17
36    RT @dog_rates: This is Lilly. She just paralle...        8.305833e+17
68    RT @dog_rates: This is Emmy. She was adopted t...        8.780576e+17
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73    RT @dog_rates: Meet Shadow. In an attempt to r...      8.782815e+17
74    RT @dog_rates: Meet Terrance. He's being yelle...     6.690004e+17
78    RT @rachel2195: @dog_rates the boyfriend and h...     8.768508e+17
91    RT @dog_rates: This is Coco. At first I though...      8.663350e+17
95    RT @dog_rates: This is Walter. He won't start ...      8.688804e+17
97    RT @dog_rates: This is Sierra. She's one preci...      8.732138e+17
101   RT @loganamnosis: Penelope here is doing me qu...     8.726576e+17
109   RT @dog_rates: This is Dawn. She's just checki...      8.410770e+17
118   RT @dog_rates: We only rate dogs. This is quit...      8.591970e+17
124   RT @dog_rates: Say hello to Cooper. His expres...      8.685523e+17
130   RT @rachaeleasler: these @dog_rates hats are 1...     8.650134e+17
132   RT @dog_rates: This is Jamesy. He gives a kiss...      8.664507e+17
137   RT @dog_rates: Here's a pupper before and afte...      8.378202e+17
146   RT @dog_rates: Say hello to Quinn. She's quite...      8.630625e+17
155   RT @dog_rates: "Good afternoon class today we'...      8.066291e+17
159   RT @dog_rates: Meet Lorenzo. He's an avid nift...      8.605638e+17
160   RT @tallylott: h*ckin adorable promposal. 13/1...     8.609145e+17
165   RT @dog_rates: Ohboyohboyohboyohboyohboyohboyo...      7.616730e+17
171   RT @dog_rates: Meet Winston. He knows he's a l...      8.395493e+17
180   RT @AaronChewning: First time wearing my @dog_...     8.570611e+17
182   RT @dog_rates: This is Luna. It's her first ti...      8.447048e+17
185   RT @Jenna_Marbles: @dog_rates Thanks for ratin...     8.563302e+17
194   RT @dog_rates: Meet George. He looks slightly ...      8.421635e+17
195   RT @frasercampbell_: oh my... what's that... b...     8.551225e+17
204   RT @dog_rates: I usually only share these on F...      8.316501e+17
211   RT @dog_rates: This is Astrid. She's a guide d...      8.293743e+17
...                                   ...                          ...
784   RT @dog_rates: After so many requests, this is...      7.403732e+17
794   RT @dog_rates: Meet Fizz. She thinks love is a...      7.713808e+17
800   RT @dog_rates: This is Gromit. He's pupset bec...      7.652221e+17
811   RT @dog_rates: This is Frankie. He's wearing b...      6.733201e+17
815   RT @katieornah: @dog_rates learning a lot at c...     7.710021e+17
818   RT @dog_rates: Here's a doggo blowing bubbles...       7.392382e+17
822   RT @dog_rates: This is just downright precious...      7.410673e+17
826   RT @dog_rates: Ever seen a dog pet another dog...      7.069045e+17
829   RT @dog_rates: When it's Janet from accounting...      7.001438e+17
833   RT @dog_rates: This is Nollie. She's waving at...      7.399792e+17
841   RT @dog_rates: We only rate dogs... this is a ...      7.599238e+17
847   RT @dog_rates: This is Colby. He's currently r...      7.258423e+17
860   RT @dog_rates: Meet Eve. She's a raging alcoho...      6.732953e+17
868   RT @dog_rates: "Tristan do not speak to me wit...      6.853251e+17
872   RT @dog_rates: Oh. My. God. 13/10 magical af h...      7.116948e+17
885   RT @hownottodraw: The story/person behind @dog...     7.601538e+17
890   RT @dog_rates: This... is a Tyrannosaurus rex...       7.395441e+17
895   RT @dog_rates: AT DAWN...\r\nWE RIDE\r\n\r\n11...      6.703191e+17
908   RT @dog_rates: This is Chompsky. He lives up t...      6.790626e+17
911   RT @jon_hill987: @dog_rates There is a cunning...      7.575971e+17
926   RT @dog_rates: This is Rubio. He has too much ...      6.791584e+17
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937    RT @dog_rates: This is Carly. She's actually 2...        6.815232e+17
943    RT @dog_rates: HEY PUP WHAT'S THE PART OF THE ...        6.835159e+17
949    RT @dog_rates: Everyone needs to watch this. 1...        6.753544e+17
1012   RT @dog_rates: This pupper killed this great w...        7.047611e+17
1023   RT @dog_rates: This is Shaggy. He knows exactl...        6.678667e+17
1043   RT @dog_rates: Extremely intelligent dog here...         6.671383e+17
1242   RT @twitter: @dog_rates Awesome Tweet! 12/10. ...        7.119983e+17
2259   RT @dogratingrating: Exceptional talent. Origi...        6.675487e+17
2260   RT @dogratingrating: Unoriginal idea. Blatant ...        6.675484e+17


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784                4.196984e+09  2016-06-08 02:41:38 +0000
794                4.196984e+09  2016-09-01 16:14:48 +0000
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32	https://twitter.com/dog_rates/status/886053434...	12
36	https://twitter.com/dog_rates/status/830583320...	13
68	https://twitter.com/dog_rates/status/878057613...	14
73	https://www.gofundme.com/3yd6y1c,https://twitt...	13
74	https://twitter.com/dog_rates/status/669000397...	11
78	https://twitter.com/rachel2195/status/87685077...	14
91	https://twitter.com/dog_rates/status/866334964...	12
95	https://twitter.com/dog_rates/status/868880397...	14
97	https://www.gofundme.com/help-my-baby-sierra-g...	12
101	https://twitter.com/loganamnosis/status/872657...	14
109	https://twitter.com/dog_rates/status/841077006...	12
118	https://twitter.com/dog_rates/status/859196978...	12
124	https://www.gofundme.com/3ti3nps,https://twitt...	12
130	https://twitter.com/rachaeleasler/status/86501...	13
132	https://twitter.com/dog_rates/status/866450705...	13
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146	https://www.gofundme.com/helpquinny,https://tw...	13
155	https://twitter.com/dog_rates/status/806629075...	13
159	https://www.gofundme.com/help-lorenzo-beat-can...	13
160	https://twitter.com/tallylott/status/860914485...	13
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211	https://twitter.com/dog_rates/status/829374341...	13
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815	https://twitter.com/katieornah/status/77100213...	12
818	https://twitter.com/dog_rates/status/739238157...	13
822	https://twitter.com/dog_rates/status/741067306...	12
826	https://vine.co/v/iXQAm5Lrgrh,https://vine.co/...	13
829	https://twitter.com/dog_rates/status/700143752...	10
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926	https://twitter.com/dog_rates/status/679158373...	11
937	https://twitter.com/dog_rates/status/681523177...	12
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19	10	Canela	None	None	None	None
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36	10	Lilly	None	None	None	None
68	10	Emmy	None	None	None	None
73	10	Shadow	None	None	None	None
74	10	Terrance	None	None	None	None
78	10	None	None	None	pupper	None

91	10	Coco	None	None	None	None
95	10	Walter	None	None	None	None
97	10	Sierra	None	None	pupper	None
101	10	None	None	None	None	None
109	10	Dawn	None	None	None	None
118	10	quite	None	None	None	None
124	10	Cooper	None	None	None	None
130	10	None	None	None	None	None
132	10	Jamesy	None	None	pupper	None
137	10	None	None	None	pupper	None
146	10	Quinn	None	None	None	None
155	10	None	None	None	None	None
159	10	Lorenzo	None	None	None	None
160	10	None	None	None	None	None
165	10	None	None	None	None	None
171	10	Winston	None	None	None	None
180	10	None	None	None	None	None
182	10	Luna	None	None	None	None
185	10	None	None	None	None	None
194	10	George	None	None	None	None
195	10	None	None	None	None	None
204	10	None	None	None	None	None
211	10	Astrid	doggo	None	None	None
...	...	...	...	...	...	...
784	11	None	None	None	None	None
794	10	Fizz	None	None	None	None
800	10	Gromit	None	None	None	None
811	10	Frankie	None	None	None	None
815	10	None	None	None	pupper	None
818	10	None	doggo	None	None	None
822	10	just	doggo	None	pupper	None
826	10	None	None	None	None	None
829	10	None	None	None	pupper	None
833	10	Nollie	None	None	None	None
841	10	None	None	None	None	None
847	10	Colby	None	None	None	None
860	10	Eve	None	None	pupper	None
868	10	None	None	None	None	None
872	10	None	None	None	None	None
885	10	None	None	None	None	None
890	10	None	None	None	None	None
895	10	None	None	None	None	None
908	10	Chompsky	None	None	None	None
911	10	None	None	None	pupper	None
926	10	Rubio	None	None	None	None
937	10	Carly	None	None	None	None
943	10	None	None	None	None	None
949	10	None	None	None	None	None

```
1012                     10      None    None    None  pupper  None
1023                     10    Shaggy    None    None    None  None
1043                     10      None    None    None    None  None
1242                     10      None    None    None    None  None
2259                     10      None    None    None    None  None
2260                     10      None    None    None    None  None

[181 rows x 17 columns]
```

In [34]: *# drop these 181 rows to clean up this retweet issue .*
         df_clean.drop(df_clean[df_clean['retweeted_status_id'].notnull()== True].index,inplace=

12   Testing part to make sure those rows are dropped .

In [35]: df.info()

         df_clean.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
<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
```

13 Define

rating_numerator and rating_denominator should be in float

14 Code to convert ratings into strings

```
In [36]: df_clean['rating_numerator'] = df_clean['rating_numerator'].astype(float)
         df_clean['rating_denominator'] = df_clean['rating_denominator'].astype(float)
```

15 Testing part to make sure it is converted into string. below columns values of ratings are indicated by float64

```
In [37]: df_clean.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 float64
rating_denominator          2175 non-null float64
name                        2175 non-null object
```

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```
doggo                           2175 non-null object
floofer                         2175 non-null object
pupper                          2175 non-null object
puppo                           2175 non-null object
dtypes: float64(6), int64(1), object(10)
memory usage: 305.9+ KB
```

16   Define

tweet_id column should be objects.

17   code to convert tweet_id to string .

```
In [38]: df_clean['tweet_id'] = df_clean['tweet_id'].astype(str)
```

18   Test - make sure tweet_id is a object not int64 .

```
In [39]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 17 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 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 float64
rating_denominator              2175 non-null float64
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(6), object(11)
memory usage: 305.9+ KB
```

19   Define - Convert the timestamp column from a string to DateTime

20   Code - to clean up the isssue

```
In [40]: df_clean['timestamp'] = pd.to_datetime(df_clean['timestamp'])

In [41]: df_clean['date'] = df_clean['timestamp'].apply(lambda time: time.strftime('%m-%d-%Y'))
         df_clean['time'] = df_clean['timestamp'].apply(lambda time: time.strftime('%H:%M'))
```

21   Test - to make sure timestamp is correctly modified as date & time .

```
In [42]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 19 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
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 float64
rating_denominator            2175 non-null float64
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
date                          2175 non-null object
time                          2175 non-null object
dtypes: datetime64[ns](1), float64(6), object(12)
memory usage: 339.8+ KB


In [43]: df_clean.head(2)

Out[43]:             tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
         0  892420643555336193                    NaN                  NaN
         1  892177421306343426                    NaN                  NaN

                   timestamp                                   source  \
         0 2017-08-01 16:23:56  <a href="http://twitter.com/download/iphone" r...
         1 2017-08-01 00:17:27  <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

   retweeted_status_user_id retweeted_status_timestamp  \
0                        NaN                        NaN
1                        NaN                        NaN

                                   expanded_urls  rating_numerator  \
0  https://twitter.com/dog_rates/status/892420643...               13.0
1  https://twitter.com/dog_rates/status/892177421...               13.0

   rating_denominator       name doggo floofer pupper puppo        date   time
0                10.0   Phineas  None    None   None  None  08-01-2017  16:23
1                10.0     Tilly  None    None   None  None  08-01-2017  00:17
```

22 Define - clean up by correcting names

23 code

```python
In [44]: df_clean['name'].replace('the', 'None', inplace=True)
         df_clean['name'].replace("light",'None', inplace=True)
         df_clean['name'].replace("life",'None', inplace=True)
         df_clean['name'].replace("an",'None', inplace=True)
         df_clean['name'].replace("a",'None', inplace=True)
         df_clean['name'].replace("by",'None', inplace=True)
         df_clean['name'].replace("actually",'None', inplace=True)
         df_clean['name'].replace("just",'None', inplace=True)
         df_clean['name'].replace("getting",'None', inplace=True)
         df_clean['name'].replace("infuriating",'None', inplace=True)
         df_clean['name'].replace("old",'None', inplace=True)
         df_clean['name'].replace("all",'None', inplace=True)
         df_clean['name'].replace("this",'None', inplace=True)
         df_clean['name'].replace("very",'None', inplace=True)
         df_clean['name'].replace("mad",'None', inplace=True)
         df_clean['name'].replace("not",'None', inplace=True)
         df_clean['name'].replace("one",'None', inplace=True)
         df_clean['name'].replace("my",'None', inplace=True)
         df_clean['name'].replace("O","O'Malley", inplace=True)
         df_clean['name'].replace("quite","None", inplace=True)
         df_clean['name'].replace("such","None", inplace=True)
```

24 Test - by info function and name column non null values reduced to 2175

```
In [45]: df.info()
         df_clean.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
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 19 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
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 float64
rating_denominator          2175 non-null float64
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
```

```
date                            2175 non-null object
time                            2175 non-null object
dtypes: datetime64[ns](1), float64(6), object(12)
memory usage: 339.8+ KB
```

25 Define - Combining the Dog stages into one column names called stages - instead of doggo , floofer , pupper etc .

26 code to comine all stages into one column and replace the value with appriporate values from 3 stages columns .

```
In [46]: df_clean['stage'] = df[['doggo', 'floofer','pupper','puppo']].apply(lambda x: ''.join(x

         df_clean['stage'].replace("NoneNoneNoneNone","None ", inplace=True)
         df_clean['stage'].replace("doggoNoneNoneNone","doggo", inplace=True)
         df_clean['stage'].replace("NoneflooferNoneNone","floofer", inplace=True)
         df_clean['stage'].replace("NoneNonepupperNone","pupper", inplace=True)
         df_clean['stage'].replace("NoneNoneNonepuppo","puppo", inplace=True)
```

27 test the data in stage column that all the stages are combined

```
In [47]: df_clean

Out[47]:                  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
         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
30	886267009285017600	8.862664e+17	2.281182e+09
...	...	...	...
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	source \
0	2017-08-01 16:23:56	<a href="http://twitter.com/download/iphone" r...
1	2017-08-01 00:17:27	<a href="http://twitter.com/download/iphone" r...
2	2017-07-31 00:18:03	<a href="http://twitter.com/download/iphone" r...
3	2017-07-30 15:58:51	<a href="http://twitter.com/download/iphone" r...
4	2017-07-29 16:00:24	<a href="http://twitter.com/download/iphone" r...
5	2017-07-29 00:08:17	<a href="http://twitter.com/download/iphone" r...

```
6      2017-07-28 16:27:12   <a href="http://twitter.com/download/iphone" r...
7      2017-07-28 00:22:40   <a href="http://twitter.com/download/iphone" r...
8      2017-07-27 16:25:51   <a href="http://twitter.com/download/iphone" r...
9      2017-07-26 15:59:51   <a href="http://twitter.com/download/iphone" r...
10     2017-07-26 00:31:25   <a href="http://twitter.com/download/iphone" r...
11     2017-07-25 16:11:53   <a href="http://twitter.com/download/iphone" r...
12     2017-07-25 01:55:32   <a href="http://twitter.com/download/iphone" r...
13     2017-07-25 00:10:02   <a href="http://twitter.com/download/iphone" r...
14     2017-07-24 17:02:04   <a href="http://twitter.com/download/iphone" r...
15     2017-07-24 00:19:32   <a href="http://twitter.com/download/iphone" r...
16     2017-07-23 00:22:39   <a href="http://twitter.com/download/iphone" r...
17     2017-07-22 16:56:37   <a href="http://twitter.com/download/iphone" r...
18     2017-07-22 00:23:06   <a href="http://twitter.com/download/iphone" r...
20     2017-07-20 16:49:33   <a href="http://twitter.com/download/iphone" r...
21     2017-07-19 16:06:48   <a href="http://twitter.com/download/iphone" r...
22     2017-07-19 03:39:09   <a href="http://twitter.com/download/iphone" r...
23     2017-07-19 00:47:34   <a href="http://twitter.com/download/iphone" r...
24     2017-07-18 16:08:03   <a href="http://twitter.com/download/iphone" r...
25     2017-07-18 00:07:08   <a href="http://twitter.com/download/iphone" r...
26     2017-07-17 16:17:36   <a href="http://twitter.com/download/iphone" r...
27     2017-07-16 23:58:41   <a href="http://twitter.com/download/iphone" r...
28     2017-07-16 20:14:00   <a href="http://twitter.com/download/iphone" r...
29     2017-07-15 23:25:31   <a href="http://twitter.com/download/iphone" r...
30     2017-07-15 16:51:35   <a href="http://twitter.com/download/iphone" r...
...                   ...                                                    ...
2326   2015-11-17 00:24:19   <a href="http://twitter.com/download/iphone" r...
2327   2015-11-17 00:06:54   <a href="http://twitter.com/download/iphone" r...
2328   2015-11-16 23:23:41   <a href="http://twitter.com/download/iphone" r...
2329   2015-11-16 21:54:18   <a href="http://twitter.com/download/iphone" r...
2330   2015-11-16 21:10:36   <a href="http://twitter.com/download/iphone" r...
2331   2015-11-16 20:32:58   <a href="http://twitter.com/download/iphone" r...
2332   2015-11-16 20:01:42   <a href="http://twitter.com/download/iphone" r...
2333   2015-11-16 19:31:45   <a href="http://twitter.com/download/iphone" r...
2334   2015-11-16 16:37:02   <a href="http://twitter.com/download/iphone" r...
2335   2015-11-16 16:11:11   <a href="http://twitter.com/download/iphone" r...
2336   2015-11-16 15:14:19   <a href="http://twitter.com/download/iphone" r...
2337   2015-11-16 14:57:41   <a href="http://twitter.com/download/iphone" r...
2338   2015-11-16 04:02:55   <a href="http://twitter.com/download/iphone" r...
2339   2015-11-16 03:55:04   <a href="http://twitter.com/download/iphone" r...
2340   2015-11-16 03:44:34   <a href="http://twitter.com/download/iphone" r...
2341   2015-11-16 03:22:39   <a href="http://twitter.com/download/iphone" r...
2342   2015-11-16 02:38:37   <a href="http://twitter.com/download/iphone" r...
2343   2015-11-16 01:59:36   <a href="http://twitter.com/download/iphone" r...
2344   2015-11-16 01:52:02   <a href="http://twitter.com/download/iphone" r...
2345   2015-11-16 01:22:45   <a href="http://twitter.com/download/iphone" r...
2346   2015-11-16 01:01:59   <a href="http://twitter.com/download/iphone" r...
2347   2015-11-16 00:55:59   <a href="http://twitter.com/download/iphone" r...
2348   2015-11-16 00:49:46   <a href="http://twitter.com/download/iphone" r...
```

```
2349 2015-11-16 00:35:11  <a href="http://twitter.com/download/iphone" r...
2350 2015-11-16 00:30:50  <a href="http://twitter.com/download/iphone" r...
2351 2015-11-16 00:24:50  <a href="http://twitter.com/download/iphone" r...
2352 2015-11-16 00:04:52  <a href="http://twitter.com/download/iphone" r...
2353 2015-11-15 23:21:54  <a href="http://twitter.com/download/iphone" r...
2354 2015-11-15 23:05:30  <a href="http://twitter.com/download/iphone" r...
2355 2015-11-15 22:32:08  <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
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
30     @NonWhiteHat @MayhewMayhem omg hello tanner yo...                  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/ws2AMaNwPW        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
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
30                        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...              13.0
1     https://twitter.com/dog_rates/status/892177421...              13.0
2     https://twitter.com/dog_rates/status/891815181...              12.0
3     https://twitter.com/dog_rates/status/891689557...              13.0
4     https://twitter.com/dog_rates/status/891327558...              12.0
5     https://twitter.com/dog_rates/status/891087950...              13.0
6     https://gofundme.com/ydvmve-surgery-for-jax,ht...              13.0
7     https://twitter.com/dog_rates/status/890729181...              13.0
8     https://twitter.com/dog_rates/status/890609185...              13.0
```

```
9        https://twitter.com/dog_rates/status/890240255...    14.0
10       https://twitter.com/dog_rates/status/890006608...    13.0
11       https://twitter.com/dog_rates/status/889880896...    13.0
12       https://twitter.com/dog_rates/status/889665388...    13.0
13       https://twitter.com/dog_rates/status/889638837...    12.0
14       https://twitter.com/dog_rates/status/889531135...    13.0
15       https://twitter.com/dog_rates/status/889278841...    13.0
16       https://twitter.com/dog_rates/status/888917238...    12.0
17       https://twitter.com/dog_rates/status/888804989...    13.0
18       https://twitter.com/dog_rates/status/888554962...    13.0
20       https://twitter.com/dog_rates/status/888078434...    12.0
21       https://twitter.com/dog_rates/status/887705289...    13.0
22       https://twitter.com/dog_rates/status/887517139...    14.0
23       https://twitter.com/dog_rates/status/887473957...    13.0
24       https://twitter.com/dog_rates/status/887343217...    13.0
25       https://twitter.com/dog_rates/status/887101392...    12.0
26       https://twitter.com/dog_rates/status/886983233...    13.0
27       https://www.gofundme.com/mingusneedsus,https:/...    13.0
28       https://twitter.com/dog_rates/status/886680336...    13.0
29       https://twitter.com/dog_rates/status/886366144...    12.0
30                                                    NaN     12.0
...                                                    ...     ...
2326     https://twitter.com/dog_rates/status/666411507...     2.0
2327     https://twitter.com/dog_rates/status/666407126...     7.0
2328     https://twitter.com/dog_rates/status/666396247...     9.0
2329     https://twitter.com/dog_rates/status/666373753...    11.0
2330     https://twitter.com/dog_rates/status/666362758...     6.0
2331     https://twitter.com/dog_rates/status/666353288...     8.0
2332     https://twitter.com/dog_rates/status/666345417...    10.0
2333     https://twitter.com/dog_rates/status/666337882...     9.0
2334     https://twitter.com/dog_rates/status/666293911...     3.0
2335     https://twitter.com/dog_rates/status/666287406...     1.0
2336     https://twitter.com/dog_rates/status/666273097...    11.0
2337     https://twitter.com/dog_rates/status/666268910...    10.0
2338     https://twitter.com/dog_rates/status/666104133...     1.0
2339     https://twitter.com/dog_rates/status/666102155...    11.0
2340     https://twitter.com/dog_rates/status/666099513...     8.0
2341     https://twitter.com/dog_rates/status/666094000...     9.0
2342     https://twitter.com/dog_rates/status/666082916...     6.0
2343     https://twitter.com/dog_rates/status/666073100...    10.0
2344     https://twitter.com/dog_rates/status/666071193...     9.0
2345     https://twitter.com/dog_rates/status/666063827...    10.0
2346     https://twitter.com/dog_rates/status/666058600...     8.0
2347     https://twitter.com/dog_rates/status/666057090...     9.0
2348     https://twitter.com/dog_rates/status/666055525...    10.0
2349     https://twitter.com/dog_rates/status/666051853...     2.0
2350     https://twitter.com/dog_rates/status/666050758...    10.0
2351     https://twitter.com/dog_rates/status/666049248...     5.0
```

```
2352  https://twitter.com/dog_rates/status/666044226...                6.0
2353  https://twitter.com/dog_rates/status/666033412...                9.0
2354  https://twitter.com/dog_rates/status/666029285...                7.0
2355  https://twitter.com/dog_rates/status/666020888...                8.0
```

	rating_denominator	name	doggo	floofer	pupper	puppo	date	\
0	10.0	Phineas	None	None	None	None	08-01-2017	
1	10.0	Tilly	None	None	None	None	08-01-2017	
2	10.0	Archie	None	None	None	None	07-31-2017	
3	10.0	Darla	None	None	None	None	07-30-2017	
4	10.0	Franklin	None	None	None	None	07-29-2017	
5	10.0	None	None	None	None	None	07-29-2017	
6	10.0	Jax	None	None	None	None	07-28-2017	
7	10.0	None	None	None	None	None	07-28-2017	
8	10.0	Zoey	None	None	None	None	07-27-2017	
9	10.0	Cassie	doggo	None	None	None	07-26-2017	
10	10.0	Koda	None	None	None	None	07-26-2017	
11	10.0	Bruno	None	None	None	None	07-25-2017	
12	10.0	None	None	None	None	puppo	07-25-2017	
13	10.0	Ted	None	None	None	None	07-25-2017	
14	10.0	Stuart	None	None	None	puppo	07-24-2017	
15	10.0	Oliver	None	None	None	None	07-24-2017	
16	10.0	Jim	None	None	None	None	07-23-2017	
17	10.0	Zeke	None	None	None	None	07-22-2017	
18	10.0	Ralphus	None	None	None	None	07-22-2017	
20	10.0	Gerald	None	None	None	None	07-20-2017	
21	10.0	Jeffrey	None	None	None	None	07-19-2017	
22	10.0	None	None	None	None	None	07-19-2017	
23	10.0	Canela	None	None	None	None	07-19-2017	
24	10.0	None	None	None	None	None	07-18-2017	
25	10.0	None	None	None	None	None	07-18-2017	
26	10.0	Maya	None	None	None	None	07-17-2017	
27	10.0	Mingus	None	None	None	None	07-16-2017	
28	10.0	Derek	None	None	None	None	07-16-2017	
29	10.0	Roscoe	None	None	pupper	None	07-15-2017	
30	10.0	None	None	None	None	None	07-15-2017	
...	...	...	...	...	...	...	...	
2326	10.0	None	None	None	None	None	11-17-2015	
2327	10.0	None	None	None	None	None	11-17-2015	
2328	10.0	None	None	None	None	None	11-16-2015	
2329	10.0	None	None	None	None	None	11-16-2015	
2330	10.0	None	None	None	None	None	11-16-2015	
2331	10.0	None	None	None	None	None	11-16-2015	
2332	10.0	None	None	None	None	None	11-16-2015	
2333	10.0	None	None	None	None	None	11-16-2015	
2334	10.0	None	None	None	None	None	11-16-2015	
2335	2.0	None	None	None	None	None	11-16-2015	
2336	10.0	None	None	None	None	None	11-16-2015	

2337	10.0	None	None	None	None	None	11-16-2015
2338	10.0	None	None	None	None	None	11-16-2015
2339	10.0	None	None	None	None	None	11-16-2015
2340	10.0	None	None	None	None	None	11-16-2015
2341	10.0	None	None	None	None	None	11-16-2015
2342	10.0	None	None	None	None	None	11-16-2015
2343	10.0	None	None	None	None	None	11-16-2015
2344	10.0	None	None	None	None	None	11-16-2015
2345	10.0	None	None	None	None	None	11-16-2015
2346	10.0	None	None	None	None	None	11-16-2015
2347	10.0	None	None	None	None	None	11-16-2015
2348	10.0	None	None	None	None	None	11-16-2015
2349	10.0	None	None	None	None	None	11-16-2015
2350	10.0	None	None	None	None	None	11-16-2015
2351	10.0	None	None	None	None	None	11-16-2015
2352	10.0	None	None	None	None	None	11-16-2015
2353	10.0	None	None	None	None	None	11-15-2015
2354	10.0	None	None	None	None	None	11-15-2015
2355	10.0	None	None	None	None	None	11-15-2015

	time	stage
0	16:23	None
1	00:17	None
2	00:18	None
3	15:58	None
4	16:00	None
5	00:08	None
6	16:27	None
7	00:22	None
8	16:25	None
9	15:59	doggo
10	00:31	None
11	16:11	None
12	01:55	puppo
13	00:10	None
14	17:02	puppo
15	00:19	None
16	00:22	None
17	16:56	None
18	00:23	None
20	16:49	None
21	16:06	None
22	03:39	None
23	00:47	None
24	16:08	None
25	00:07	None
26	16:17	None
27	23:58	None

```
28    20:14   None
29    23:25   pupper
30    16:51   None
...      ...      ...
2326  00:24   None
2327  00:06   None
2328  23:23   None
2329  21:54   None
2330  21:10   None
2331  20:32   None
2332  20:01   None
2333  19:31   None
2334  16:37   None
2335  16:11   None
2336  15:14   None
2337  14:57   None
2338  04:02   None
2339  03:55   None
2340  03:44   None
2341  03:22   None
2342  02:38   None
2343  01:59   None
2344  01:52   None
2345  01:22   None
2346  01:01   None
2347  00:55   None
2348  00:49   None
2349  00:35   None
2350  00:30   None
2351  00:24   None
2352  00:04   None
2353  23:21   None
2354  23:05   None
2355  22:32   None

[2175 rows x 20 columns]
```

28 Define - Remove unwanted & null columns from the df_clean dataframe.

29 code part to remove null & unwanted columns .

```python
In [48]: df_clean.drop(['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',
                       'doggo',
                       'floofer',
                       'pupper',
                       'puppo'], axis=1,inplace=True)
```

30 Test - verify all null values columns and unwanted columns are dropped .

```
In [49]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 7 columns):
tweet_id            2175 non-null object
rating_numerator    2175 non-null float64
rating_denominator  2175 non-null float64
name                2175 non-null object
date                2175 non-null object
time                2175 non-null object
stage               2175 non-null object
dtypes: float64(2), object(5)
memory usage: 135.9+ KB


In [50]: df_clean.head(2)

Out[50]:              tweet_id  rating_numerator  rating_denominator      name  \
         0  892420643555336193              13.0                10.0  Phineas
         1  892177421306343426              13.0                10.0    Tilly

                 date   time  stage
         0  08-01-2017  16:23  None
         1  08-01-2017  00:17  None

In [51]: column_title = ['tweet_id',
                         'rating_numerator',
                         'rating_denominator',
                         'date',
                         'time',
                         'name',
                         'stage']
         df_clean = df_clean.reindex(columns=column_title)

In [52]: df_clean
```

```
Out[52]:                  tweet_id  rating_numerator  rating_denominator        date  \
       0      892420643555336193              13.0                10.0  08-01-2017
       1      892177421306343426              13.0                10.0  08-01-2017
       2      891815181378084864              12.0                10.0  07-31-2017
       3      891689557279858688              13.0                10.0  07-30-2017
       4      891327558926688256              12.0                10.0  07-29-2017
       5      891087950875897856              13.0                10.0  07-29-2017
       6      890971913173991426              13.0                10.0  07-28-2017
       7      890729181411237888              13.0                10.0  07-28-2017
       8      890609185150312448              13.0                10.0  07-27-2017
       9      890240255349198849              14.0                10.0  07-26-2017
       10     890006608113172480              13.0                10.0  07-26-2017
       11     889880896479866881              13.0                10.0  07-25-2017
       12     889665388333682689              13.0                10.0  07-25-2017
       13     889638837579907072              12.0                10.0  07-25-2017
       14     889531135344209921              13.0                10.0  07-24-2017
       15     889278841981685760              13.0                10.0  07-24-2017
       16     888917238123831296              12.0                10.0  07-23-2017
       17     888804989199671297              13.0                10.0  07-22-2017
       18     888554962724278272              13.0                10.0  07-22-2017
       20     888078434458587136              12.0                10.0  07-20-2017
       21     887705289381826560              13.0                10.0  07-19-2017
       22     887517139158093824              14.0                10.0  07-19-2017
       23     887473957103951883              13.0                10.0  07-19-2017
       24     887343217045368832              13.0                10.0  07-18-2017
       25     887101392804085760              12.0                10.0  07-18-2017
       26     886983233522544640              13.0                10.0  07-17-2017
       27     886736880519319552              13.0                10.0  07-16-2017
       28     886680336477933568              13.0                10.0  07-16-2017
       29     886366144734445568              12.0                10.0  07-15-2017
       30     886267009285017600              12.0                10.0  07-15-2017
       ...                    ...               ...                 ...         ...
       2326   666411507551481857               2.0                10.0  11-17-2015
       2327   666407126856765440               7.0                10.0  11-17-2015
       2328   666396247373291520               9.0                10.0  11-16-2015
       2329   666373753744588802              11.0                10.0  11-16-2015
       2330   666362758909284353               6.0                10.0  11-16-2015
       2331   666353288456101888               8.0                10.0  11-16-2015
       2332   666345417576210432              10.0                10.0  11-16-2015
       2333   666337882303524864               9.0                10.0  11-16-2015
       2334   666293911632134144               3.0                10.0  11-16-2015
       2335   666287406224695296               1.0                 2.0  11-16-2015
       2336   666273097616637952              11.0                10.0  11-16-2015
       2337   666268910803644416              10.0                10.0  11-16-2015
       2338   666104133288665088               1.0                10.0  11-16-2015
       2339   666102155909144576              11.0                10.0  11-16-2015
       2340   666099513787052032               8.0                10.0  11-16-2015
       2341   666094000022159362               9.0                10.0  11-16-2015
```

2342	666082916733198337	6.0	10.0	11-16-2015
2343	666073100786774016	10.0	10.0	11-16-2015
2344	666071193221509120	9.0	10.0	11-16-2015
2345	666063827256086533	10.0	10.0	11-16-2015
2346	666058600524156928	8.0	10.0	11-16-2015
2347	666057090499244032	9.0	10.0	11-16-2015
2348	666055525042405380	10.0	10.0	11-16-2015
2349	666051853826850816	2.0	10.0	11-16-2015
2350	666050758794694657	10.0	10.0	11-16-2015
2351	666049248165822465	5.0	10.0	11-16-2015
2352	666044226329800704	6.0	10.0	11-16-2015
2353	666033412701032449	9.0	10.0	11-15-2015
2354	666029285002620928	7.0	10.0	11-15-2015
2355	666020888022790149	8.0	10.0	11-15-2015

	time	name	stage
0	16:23	Phineas	None
1	00:17	Tilly	None
2	00:18	Archie	None
3	15:58	Darla	None
4	16:00	Franklin	None
5	00:08	None	None
6	16:27	Jax	None
7	00:22	None	None
8	16:25	Zoey	None
9	15:59	Cassie	doggo
10	00:31	Koda	None
11	16:11	Bruno	None
12	01:55	None	puppo
13	00:10	Ted	None
14	17:02	Stuart	puppo
15	00:19	Oliver	None
16	00:22	Jim	None
17	16:56	Zeke	None
18	00:23	Ralphus	None
20	16:49	Gerald	None
21	16:06	Jeffrey	None
22	03:39	None	None
23	00:47	Canela	None
24	16:08	None	None
25	00:07	None	None
26	16:17	Maya	None
27	23:58	Mingus	None
28	20:14	Derek	None
29	23:25	Roscoe	pupper
30	16:51	None	None
...	...	...	...
2326	00:24	None	None

```
2327  00:06       None    None
2328  23:23       None    None
2329  21:54       None    None
2330  21:10       None    None
2331  20:32       None    None
2332  20:01       None    None
2333  19:31       None    None
2334  16:37       None    None
2335  16:11       None    None
2336  15:14       None    None
2337  14:57       None    None
2338  04:02       None    None
2339  03:55       None    None
2340  03:44       None    None
2341  03:22       None    None
2342  02:38       None    None
2343  01:59       None    None
2344  01:52       None    None
2345  01:22       None    None
2346  01:01       None    None
2347  00:55       None    None
2348  00:49       None    None
2349  00:35       None    None
2350  00:30       None    None
2351  00:24       None    None
2352  00:04       None    None
2353  23:21       None    None
2354  23:05       None    None
2355  22:32       None    None

[2175 rows x 7 columns]
```

31 define - Date and Time columns should be datetime objects

32 code for coversion and info command to test the conversion

```
In [53]: df_clean['date'] = pd.to_datetime(df_clean['date'])
         df_clean['time'] = pd.to_datetime(df_clean['time'])

In [54]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 7 columns):
tweet_id             2175 non-null object
rating_numerator     2175 non-null float64
rating_denominator   2175 non-null float64
```

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```
date                        2175 non-null datetime64[ns]
time                        2175 non-null datetime64[ns]
name                        2175 non-null object
stage                       2175 non-null object
dtypes: datetime64[ns](2), float64(2), object(3)
memory usage: 135.9+ KB
```

33 saving data in CSV or TSV format for next day of analysis and visualization.

34 Archived twitter data

35 Cleaning up of DF_tweets_clean dataframe.

```
In [55]: df_tweets_clean.columns
```

```
Out[55]: Index(['contributors', 'coordinates', 'created_at', 'entities',
                'extended_entities', 'favorite_count', 'favorited', 'geo', 'id',
                'id_str', 'in_reply_to_screen_name', 'in_reply_to_status_id',
                'in_reply_to_status_id_str', 'in_reply_to_user_id',
                'in_reply_to_user_id_str', 'is_quote_status', 'lang', 'place',
                'possibly_sensitive', 'possibly_sensitive_appealable', 'quoted_status',
                'quoted_status_id', 'quoted_status_id_str', 'retweet_count',
                'retweeted', 'retweeted_status', 'source', 'text', 'truncated', 'user'],
               dtype='object')
```

36 Define -exclude retweeted_status tweets which are notnull as these are retweeted.

37 code to exclude the retweeted tweets and finally drop them

```
In [56]: df_tweets_clean[df_tweets_clean['retweeted_status'].notnull()==True] # finding the retu
         df_tweets_clean.drop(df_tweets_clean[df_tweets_clean['retweeted_status'].notnull()== Tr
```

38 testing to make sure all the 175 retweeted are dropped .

```
In [57]: df_tweets=pd.read_json('tweet_json.txt')

         df_tweets.info()
         df_tweets_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 30 entries, contributors to user
Columns: 2350 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
```

```
dtypes: object(2350)
memory usage: 551.0+ KB
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2175 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 30 columns):
contributors                 0 non-null float64
coordinates                  0 non-null float64
created_at                   2175 non-null datetime64[ns]
entities                     2175 non-null object
extended_entities            1749 non-null object
favorite_count               2175 non-null int64
favorited                    2175 non-null int64
geo                          0 non-null float64
id                           2175 non-null int64
id_str                       2175 non-null int64
in_reply_to_screen_name      78 non-null object
in_reply_to_status_id        78 non-null float64
in_reply_to_status_id_str    78 non-null float64
in_reply_to_user_id          78 non-null float64
in_reply_to_user_id_str      78 non-null float64
is_quote_status              2175 non-null int64
lang                         2175 non-null object
place                        1 non-null object
possibly_sensitive           2117 non-null float64
possibly_sensitive_appealable 2117 non-null float64
quoted_status                27 non-null object
quoted_status_id             27 non-null float64
quoted_status_id_str         27 non-null float64
retweet_count                2175 non-null int64
retweeted                    2175 non-null int64
retweeted_status             0 non-null object
source                       2175 non-null object
text                         2175 non-null object
truncated                    2175 non-null int64
user                         2175 non-null object
dtypes: datetime64[ns](1), float64(11), int64(8), object(10)
memory usage: 526.8+ KB



In [58]: df_tweets_clean.info()

<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2175 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 30 columns):
contributors                 0 non-null float64
coordinates                  0 non-null float64
created_at                   2175 non-null datetime64[ns]
entities                     2175 non-null object
```

```
extended_entities            1749 non-null object
favorite_count               2175 non-null int64
favorited                    2175 non-null int64
geo                          0 non-null float64
id                           2175 non-null int64
id_str                       2175 non-null int64
in_reply_to_screen_name      78 non-null object
in_reply_to_status_id        78 non-null float64
in_reply_to_status_id_str    78 non-null float64
in_reply_to_user_id          78 non-null float64
in_reply_to_user_id_str      78 non-null float64
is_quote_status              2175 non-null int64
lang                         2175 non-null object
place                        1 non-null object
possibly_sensitive           2117 non-null float64
possibly_sensitive_appealable 2117 non-null float64
quoted_status                27 non-null object
quoted_status_id             27 non-null float64
quoted_status_id_str         27 non-null float64
retweet_count                2175 non-null int64
retweeted                    2175 non-null int64
retweeted_status             0 non-null object
source                       2175 non-null object
text                         2175 non-null object
truncated                    2175 non-null int64
user                         2175 non-null object
dtypes: datetime64[ns](1), float64(11), int64(8), object(10)
memory usage: 526.8+ KB
```

39   Define - remove null values , unncessary columns df_tweets_clean

40   Code - to remove unnecessary columns .

```
In [59]: df_tweets_clean.drop(['contributors',
                               'coordinates',
                               'created_at',
                               'entities',
                               'extended_entities',
                               'favorited',
                               'geo',
                               'id_str',
                               'in_reply_to_screen_name',
                               'in_reply_to_status_id',
                               'in_reply_to_status_id_str',
                               'in_reply_to_user_id',
                               'in_reply_to_user_id_str',
```

```
                              'is_quote_status',
                              'lang',
                              'place',
                              'possibly_sensitive',
                              'possibly_sensitive_appealable',
                              'quoted_status',
                              'quoted_status_id',
                              'quoted_status_id_str',
                              'retweeted',
                              'retweeted_status',
                              'source',
                              'truncated',
                              'user'], axis=1,inplace=True)
```

41   test to make sure all the unncessary columns are dropped .

```
In [60]: df_tweets_clean.info()

<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2175 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 4 columns):
favorite_count    2175 non-null int64
id                2175 non-null int64
retweet_count     2175 non-null int64
text              2175 non-null object
dtypes: int64(3), object(1)
memory usage: 85.0+ KB
```

42   Define - convert tweet_id column from int64 to a string . first change the name from id to tweet_id to make sure it is consistent across other dataframes.

43   code for conversion -

```
In [61]: df_tweets_clean.rename(columns={'id': 'tweet_id'}, inplace=True)

         df_tweets_clean.tweet_id = df_tweets_clean.tweet_id.astype(str)
```

44   testing to make sure it is converted into string and column name is also changed .

```
In [62]: df_tweets_clean.info()

<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2175 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
```

```
Data columns (total 4 columns):
favorite_count    2175 non-null int64
tweet_id          2175 non-null object
retweet_count     2175 non-null int64
text              2175 non-null object
dtypes: int64(2), object(2)
memory usage: 85.0+ KB
```

45   starting cleaning up image dataframe.

46   Define - drop 66 duplicated jpg_url from images .

47   Code to delete duplicated jpg_url

```
In [63]: images_clean = images_clean.drop_duplicates(subset=['jpg_url'], keep='last')
```

48   Test to make sure duplicates dropped .

```
In [64]: sum(images_clean['jpg_url'].duplicated())
```

```
Out[64]: 0
```

```
In [65]: images.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 [66]: images_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2009 entries, 0 to 2074
Data columns (total 12 columns):
tweet_id     2009 non-null int64
jpg_url      2009 non-null object
img_num      2009 non-null int64
p1           2009 non-null object
p1_conf      2009 non-null float64
p1_dog       2009 non-null bool
p2           2009 non-null object
p2_conf      2009 non-null float64
p2_dog       2009 non-null bool
p3           2009 non-null object
p3_conf      2009 non-null float64
p3_dog       2009 non-null bool
dtypes: bool(3), float64(3), int64(2), object(4)
memory usage: 162.8+ KB
```

49   define - change tweet_id from int64 to string

50   code for conversion

```
In [67]: images_clean.tweet_id = images_clean.tweet_id.astype(str)
```

51   testing to check the tweet_id datatype .

```
In [68]: images_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2009 entries, 0 to 2074
Data columns (total 12 columns):
tweet_id     2009 non-null object
jpg_url      2009 non-null object
img_num      2009 non-null int64
p1           2009 non-null object
p1_conf      2009 non-null float64
p1_dog       2009 non-null bool
p2           2009 non-null object
p2_conf      2009 non-null float64
p2_dog       2009 non-null bool
p3           2009 non-null object
p3_conf      2009 non-null float64
p3_dog       2009 non-null bool
dtypes: bool(3), float64(3), int64(1), object(5)
memory usage: 162.8+ KB
```

```
In [69]: images_clean

Out[69]:               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_3WEAAlOoZ.jpg
         12    666073100786774016      https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
         13    666082916733198337      https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
         14    666094000022159362      https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
         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/CT56LSZWoAAlJj2.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/CT9OwFIWEAAMuRje.jpg
         23    666345417576210432      https://pbs.twimg.com/media/CT9Vn7PWoAA_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/CT9vZEYWUAAlZ05.jpg
         27    666396247373291520      https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
         28    666407126856765440      https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
         29    666411507551481857      https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
         ...                  ...                                             ...
         2044  886258384151887873      https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.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/DE5Se8FXcAAJFx4.jpg
         2048  886983233522544640      https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg
         2049  887101392804085760      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
         2050  887343217045368832    https://pbs.twimg.com/ext_tw_video_thumb/88734...
         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/DFDw2tyUQAAFke.jpg
         2056  888554962724278272      https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg
         2057  888804989199671297      https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
         2058  888917238123831296      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.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/DFrEyVuW0AAO3t9.jpg
2066  890609185150312448    https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
2067  890729181411237888    https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
2068  890971913173991426    https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
2069  891087950875897856    https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
2070  891327558926688256    https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
2071  891689557279858688    https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
2072  891815181378084864    https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
2073  892177421306343426    https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2074  892420643555336193    https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg

      img_num                         p1    p1_conf  p1_dog  \
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
```

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```
...            ...                              ...       ...    ...
2044             1                              pug  0.943575   True
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
2052             1                        limousine  0.130432  False
2053             1                           basset  0.821664   True
2054             1                   French_bulldog  0.995026   True
2055             2                         Pembroke  0.809197   True
2056             3                    Siberian_husky  0.700377   True
2057             1                 golden_retriever  0.469760   True
2058             1                 golden_retriever  0.714719   True
2059             1                          whippet  0.626152   True
2060             1                 golden_retriever  0.953442   True
2061             1                   French_bulldog  0.991650   True
2062             1                         Pembroke  0.966327   True
2063             1                   French_bulldog  0.377417   True
2064             1                          Samoyed  0.957979   True
2065             1                         Pembroke  0.511319   True
2066             1                    Irish_terrier  0.487574   True
2067             2                       Pomeranian  0.566142   True
2068             1                       Appenzeller  0.341703   True
2069             1          Chesapeake_Bay_retriever  0.425595   True
2070             2                           basset  0.555712   True
2071             1                      paper_towel  0.170278  False
2072             1                        Chihuahua  0.716012   True
2073             1                        Chihuahua  0.323581   True
2074             1                           orange  0.097049  False

                          p2  p2_conf  p2_dog                         p3  \
0                      collie  0.156665    True            Shetland_sheepdog
1           miniature_pinscher  0.074192    True            Rhodesian_ridgeback
2                    malinois  0.138584    True                     bloodhound
3                     redbone  0.360687    True             miniature_pinscher
4                  Rottweiler  0.243682    True                       Doberman
5             English_springer  0.263788    True    Greater_Swiss_Mountain_dog
6                  mud_turtle  0.045885   False                        terrapin
7             Tibetan_mastiff  0.058279    True                       fur_coat
8             shopping_basket  0.014594   False               golden_retriever
9                   komondor  0.192305    True    soft-coated_wheaten_terrier
10            Tibetan_mastiff  0.093718    True             Labrador_retriever
11          Yorkshire_terrier  0.174201    True                       Pekinese
12            English_foxhound  0.175382    True                    Ibizan_hound
13                bull_mastiff  0.404722    True                 French_bulldog
14            German_shepherd  0.078260    True                       malinois
```

15	Shih-Tzu	0.166192	True	Dandie_Dinmont
16	Newfoundland	0.149842	True	borzoi
17	cock	0.033919	False	partridge
18	desk	0.085547	False	bookcase
19	toy_terrier	0.111884	True	basenji
20	toy_poodle	0.063064	True	miniature_poodle
21	otter	0.015250	False	great_grey_owl
22	Newfoundland	0.278407	True	groenendael
23	Chesapeake_Bay_retriever	0.054787	True	Labrador_retriever
24	Siberian_husky	0.147655	True	Eskimo_dog
25	skunk	0.002402	False	hamster
26	Afghan_hound	0.259551	True	briard
27	toy_terrier	0.009397	True	papillon
28	bloodhound	0.244220	True	flat-coated_retriever
29	barracouta	0.271485	False	gar
...	...	...	...	...
2044	shower_cap	0.025286	False	Siamese_cat
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
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
...         ...       ...
2044    0.002849    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
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

[2009 rows x 12 columns]
```

52 Define - removing underscore in the columns values of p1,p2,p3 .

```
In [70]: images_clean['p1'] = images_clean['p1'].str.replace('_', ' ')
         images_clean['p2'] = images_clean['p2'].str.replace('_', ' ')
         images_clean['p3'] = images_clean['p3'].str.replace('_', ' ')

In [71]: images_clean

Out[71]:                 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_3WEAAlOoZ.jpg
         12    666073100786774016    https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
         13    666082916733198337    https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
         14    666094000022159362    https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
         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/CT56LSZWoAAlJj2.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/CT9OwFIWEAMuRje.jpg
```

```
23      666345417576210432      https://pbs.twimg.com/media/CT9Vn7PWoAA_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/CT9vZEYWUAAlZ05.jpg
27      666396247373291520      https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg
28      664407126856765440      https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg
29      666411507551481857      https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
...                    ...                                                   ...
2044    886258384151887873      https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg
2045    886366144734445568      https://pbs.twimg.com/media/DEOBTnQUwAApKEH.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/DE8yicJWOAAAvBJ.jpg
2049    887101392804085760      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
2050    887343217045368832      https://pbs.twimg.com/ext_tw_video_thumb/88734...
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_O-UQAACu20.jpg
2057    888804989199671297      https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
2058    888917238123831296      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.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/DFl99B1WsAITKsg.jpg
2064    890006608113172480      https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
2065    890240255349198849      https://pbs.twimg.com/media/DFrEyVuWOAAO3t9.jpg
2066    890609185150312448      https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
2067    890729181411237888      https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
2068    890971913173991426      https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
2069    891087950875897856      https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
2070    891327558926688256      https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
2071    891689557279858688      https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
2072    891815181378084864      https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
2073    892177421306343426      https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2074    892420643555336193      https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg

      img_num                           p1    p1_conf  p1_dog  \
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
...	...	...	...	...
2044	1	pug	0.943575	True
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
2052	1	limousine	0.130432	False
2053	1	basset	0.821664	True
2054	1	French bulldog	0.995026	True
2055	2	Pembroke	0.809197	True
2056	3	Siberian husky	0.700377	True
2057	1	golden retriever	0.469760	True
2058	1	golden retriever	0.714719	True
2059	1	whippet	0.626152	True
2060	1	golden retriever	0.953442	True
2061	1	French bulldog	0.991650	True
2062	1	Pembroke	0.966327	True
2063	1	French bulldog	0.377417	True
2064	1	Samoyed	0.957979	True
2065	1	Pembroke	0.511319	True
2066	1	Irish terrier	0.487574	True
2067	2	Pomeranian	0.566142	True
2068	1	Appenzeller	0.341703	True
2069	1	Chesapeake Bay retriever	0.425595	True

2070	2	basset	0.555712	True
2071	1	paper towel	0.170278	False
2072	1	Chihuahua	0.716012	True
2073	1	Chihuahua	0.323581	True
2074	1	orange	0.097049	False

	p2	p2_conf	p2_dog	p3 \
0	collie	0.156665	True	Shetland sheepdog
1	miniature pinscher	0.074192	True	Rhodesian ridgeback
2	malinois	0.138584	True	bloodhound
3	redbone	0.360687	True	miniature pinscher
4	Rottweiler	0.243682	True	Doberman
5	English springer	0.263788	True	Greater Swiss Mountain dog
6	mud turtle	0.045885	False	terrapin
7	Tibetan mastiff	0.058279	True	fur coat
8	shopping basket	0.014594	False	golden retriever
9	komondor	0.192305	True	soft-coated wheaten terrier
10	Tibetan mastiff	0.093718	True	Labrador retriever
11	Yorkshire terrier	0.174201	True	Pekinese
12	English foxhound	0.175382	True	Ibizan hound
13	bull mastiff	0.404722	True	French bulldog
14	German shepherd	0.078260	True	malinois
15	Shih-Tzu	0.166192	True	Dandie Dinmont
16	Newfoundland	0.149842	True	borzoi
17	cock	0.033919	False	partridge
18	desk	0.085547	False	bookcase
19	toy terrier	0.111884	True	basenji
20	toy poodle	0.063064	True	miniature poodle
21	otter	0.015250	False	great grey owl
22	Newfoundland	0.278407	True	groenendael
23	Chesapeake Bay retriever	0.054787	True	Labrador retriever
24	Siberian husky	0.147655	True	Eskimo dog
25	skunk	0.002402	False	hamster
26	Afghan hound	0.259551	True	briard
27	toy terrier	0.009397	True	papillon
28	bloodhound	0.244220	True	flat-coated retriever
29	barracouta	0.271485	False	gar
...	...	...	...	...
2044	shower cap	0.025286	False	Siamese cat
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
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
...         ...      ...
2044  0.002849    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
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

[2009 rows x 12 columns]

In [72]: images_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2009 entries, 0 to 2074
Data columns (total 12 columns):
tweet_id    2009 non-null object
jpg_url     2009 non-null object
img_num     2009 non-null int64
p1          2009 non-null object
p1_conf     2009 non-null float64
```

```
p1_dog       2009 non-null bool
p2           2009 non-null object
p2_conf      2009 non-null float64
p2_dog       2009 non-null bool
p3           2009 non-null object
p3_conf      2009 non-null float64
p3_dog       2009 non-null bool
dtypes: bool(3), float64(3), int64(1), object(5)
memory usage: 162.8+ KB
```

53 Join all the dataframe to make master dataframe

In [73]: images_clean

Out[73]:   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_3WEAA1OoZ.jpg
         12   666073100786774016   https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg
         13   666082916733198337   https://pbs.twimg.com/media/CT5m4VGWEAAtKc8.jpg
         14   666094000022159362   https://pbs.twimg.com/media/CT5w9gUW4AAsBNN.jpg
         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/CT56LSZWoAA1Jj2.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/CT9OwFIWEAMuRje.jpg
         23   666345417576210432   https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
         24   666353288456101888   https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.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-NvwmW4AAugGZ.jpg
         29   666411507551481857   https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
         ...   .
```

```
2044  886258384151887873        https://pbs.twimg.com/media/DEyfTG4UMAE4aE9.jpg
2045  886366144734445568        https://pbs.twimg.com/media/DEOBTnQUwAApKEH.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/DE8yicJWOAAAvBJ.jpg
2049  887101392804085760        https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg
2050  887343217045368832  https://pbs.twimg.com/ext_tw_video_thumb/88734...
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_O-UQAACu20.jpg
2057  888804989199671297        https://pbs.twimg.com/media/DFWra-3VYAA2piG.jpg
2058  888917238123831296        https://pbs.twimg.com/media/DFYRgsOUQAARGhO.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/DFl99B1WsAITKsg.jpg
2064  890006608113172480        https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg
2065  890240255349198849        https://pbs.twimg.com/media/DFrEyVuWOAAO3t9.jpg
2066  890609185150312448        https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg
2067  890729181411237888        https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg
2068  890971913173991426        https://pbs.twimg.com/media/DF1eOmZXUAALUcq.jpg
2069  891087950875897856        https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg
2070  891327558926688256        https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
2071  891689557279858688        https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
2072  891815181378084864        https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
2073  892177421306343426        https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
2074  892420643555336193        https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg

      img_num                     p1   p1_conf  p1_dog  \
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
...	...	...	...	...
2044	1	pug	0.943575	True
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
2052	1	limousine	0.130432	False
2053	1	basset	0.821664	True
2054	1	French bulldog	0.995026	True
2055	2	Pembroke	0.809197	True
2056	3	Siberian husky	0.700377	True
2057	1	golden retriever	0.469760	True
2058	1	golden retriever	0.714719	True
2059	1	whippet	0.626152	True
2060	1	golden retriever	0.953442	True
2061	1	French bulldog	0.991650	True
2062	1	Pembroke	0.966327	True
2063	1	French bulldog	0.377417	True
2064	1	Samoyed	0.957979	True
2065	1	Pembroke	0.511319	True
2066	1	Irish terrier	0.487574	True
2067	2	Pomeranian	0.566142	True
2068	1	Appenzeller	0.341703	True
2069	1	Chesapeake Bay retriever	0.425595	True
2070	2	basset	0.555712	True
2071	1	paper towel	0.170278	False
2072	1	Chihuahua	0.716012	True
2073	1	Chihuahua	0.323581	True
2074	1	orange	0.097049	False

	p2	p2_conf	p2_dog	p3 \
0	collie	0.156665	True	Shetland sheepdog

1	miniature pinscher	0.074192	True	Rhodesian ridgeback
2	malinois	0.138584	True	bloodhound
3	redbone	0.360687	True	miniature pinscher
4	Rottweiler	0.243682	True	Doberman
5	English springer	0.263788	True	Greater Swiss Mountain dog
6	mud turtle	0.045885	False	terrapin
7	Tibetan mastiff	0.058279	True	fur coat
8	shopping basket	0.014594	False	golden retriever
9	komondor	0.192305	True	soft-coated wheaten terrier
10	Tibetan mastiff	0.093718	True	Labrador retriever
11	Yorkshire terrier	0.174201	True	Pekinese
12	English foxhound	0.175382	True	Ibizan hound
13	bull mastiff	0.404722	True	French bulldog
14	German shepherd	0.078260	True	malinois
15	Shih-Tzu	0.166192	True	Dandie Dinmont
16	Newfoundland	0.149842	True	borzoi
17	cock	0.033919	False	partridge
18	desk	0.085547	False	bookcase
19	toy terrier	0.111884	True	basenji
20	toy poodle	0.063064	True	miniature poodle
21	otter	0.015250	False	great grey owl
22	Newfoundland	0.278407	True	groenendael
23	Chesapeake Bay retriever	0.054787	True	Labrador retriever
24	Siberian husky	0.147655	True	Eskimo dog
25	skunk	0.002402	False	hamster
26	Afghan hound	0.259551	True	briard
27	toy terrier	0.009397	True	papillon
28	bloodhound	0.244220	True	flat-coated retriever
29	barracouta	0.271485	False	gar
...	...	...	...	...
2044	shower cap	0.025286	False	Siamese cat
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
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
...	...	...
2044	0.002849	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
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

[2009 rows x 12 columns]
```

In [74]: images_clean.info()

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2009 entries, 0 to 2074
Data columns (total 12 columns):
tweet_id    2009 non-null object
jpg_url     2009 non-null object
img_num     2009 non-null int64
p1          2009 non-null object
p1_conf     2009 non-null float64
p1_dog      2009 non-null bool
p2          2009 non-null object
p2_conf     2009 non-null float64
p2_dog      2009 non-null bool
p3          2009 non-null object
p3_conf     2009 non-null float64
p3_dog      2009 non-null bool
dtypes: bool(3), float64(3), int64(1), object(5)
```

```
memory usage: 162.8+ KB


In [75]: df_clean

Out[75]:                 tweet_id  rating_numerator  rating_denominator       date  \
         0     892420643555336193              13.0                10.0  2017-08-01
         1     892177421306343426              13.0                10.0  2017-08-01
         2     891815181378084864              12.0                10.0  2017-07-31
         3     891689557279858688              13.0                10.0  2017-07-30
         4     891327558926688256              12.0                10.0  2017-07-29
         5     891087950875897856              13.0                10.0  2017-07-29
         6     890971913173991426              13.0                10.0  2017-07-28
         7     890729181411237888              13.0                10.0  2017-07-28
         8     890609185150312448              13.0                10.0  2017-07-27
         9     890240255349198849              14.0                10.0  2017-07-26
         10    890006608113172480              13.0                10.0  2017-07-26
         11    889880896479866881              13.0                10.0  2017-07-25
         12    889665388333682689              13.0                10.0  2017-07-25
         13    889638837579907072              12.0                10.0  2017-07-25
         14    889531135344209921              13.0                10.0  2017-07-24
         15    889278841981685760              13.0                10.0  2017-07-24
         16    888917238123831296              12.0                10.0  2017-07-23
         17    888804989199671297              13.0                10.0  2017-07-22
         18    888554962724278272              13.0                10.0  2017-07-22
         20    888078434458587136              12.0                10.0  2017-07-20
         21    887705289381826560              13.0                10.0  2017-07-19
         22    887517139158093824              14.0                10.0  2017-07-19
         23    887473957103951883              13.0                10.0  2017-07-19
         24    887343217045368832              13.0                10.0  2017-07-18
         25    887101392804085760              12.0                10.0  2017-07-18
         26    886983233522544640              13.0                10.0  2017-07-17
         27    886736880519319552              13.0                10.0  2017-07-16
         28    886680336477933568              13.0                10.0  2017-07-16
         29    886366144734445568              12.0                10.0  2017-07-15
         30    886267009285017600              12.0                10.0  2017-07-15
         ...                  ...               ...                 ...        ...
         2326  666411507551481857               2.0                10.0  2015-11-17
         2327  666407126856765440               7.0                10.0  2015-11-17
         2328  666396247373291520               9.0                10.0  2015-11-16
         2329  666373753744588802              11.0                10.0  2015-11-16
         2330  666362758909284353               6.0                10.0  2015-11-16
         2331  666353288456101888               8.0                10.0  2015-11-16
         2332  666345417576210432              10.0                10.0  2015-11-16
         2333  666337882303524864               9.0                10.0  2015-11-16
         2334  666293911632134144               3.0                10.0  2015-11-16
         2335  666287406224695296               1.0                 2.0  2015-11-16
         2336  666273097616637952              11.0                10.0  2015-11-16
```

```
2337    666268910803644416                       10.0                      10.0  2015-11-16
2338    666104133288665088                        1.0                      10.0  2015-11-16
2339    666102155909144576                       11.0                      10.0  2015-11-16
2340    666099513787052032                        8.0                      10.0  2015-11-16
2341    666094000022159362                        9.0                      10.0  2015-11-16
2342    666082916733198337                        6.0                      10.0  2015-11-16
2343    666073100786774016                       10.0                      10.0  2015-11-16
2344    666071193221509120                        9.0                      10.0  2015-11-16
2345    666063827256086533                       10.0                      10.0  2015-11-16
2346    666058600524156928                        8.0                      10.0  2015-11-16
2347    666057090499244032                        9.0                      10.0  2015-11-16
2348    666055525042405380                       10.0                      10.0  2015-11-16
2349    666051853826850816                        2.0                      10.0  2015-11-16
2350    666050758794694657                       10.0                      10.0  2015-11-16
2351    666049248165822465                        5.0                      10.0  2015-11-16
2352    666044226329800704                        6.0                      10.0  2015-11-16
2353    666033412701032449                        9.0                      10.0  2015-11-15
2354    666029285002620928                        7.0                      10.0  2015-11-15
2355    666020888022790149                        8.0                      10.0  2015-11-15

                      time      name  stage
0      2018-09-15 16:23:00   Phineas   None
1      2018-09-15 00:17:00     Tilly   None
2      2018-09-15 00:18:00    Archie   None
3      2018-09-15 15:58:00     Darla   None
4      2018-09-15 16:00:00  Franklin   None
5      2018-09-15 00:08:00      None   None
6      2018-09-15 16:27:00       Jax   None
7      2018-09-15 00:22:00      None   None
8      2018-09-15 16:25:00      Zoey   None
9      2018-09-15 15:59:00    Cassie  doggo
10     2018-09-15 00:31:00      Koda   None
11     2018-09-15 16:11:00     Bruno   None
12     2018-09-15 01:55:00      None  puppo
13     2018-09-15 00:10:00       Ted   None
14     2018-09-15 17:02:00    Stuart  puppo
15     2018-09-15 00:19:00    Oliver   None
16     2018-09-15 00:22:00       Jim   None
17     2018-09-15 16:56:00      Zeke   None
18     2018-09-15 00:23:00   Ralphus   None
20     2018-09-15 16:49:00    Gerald   None
21     2018-09-15 16:06:00   Jeffrey   None
22     2018-09-15 03:39:00      None   None
23     2018-09-15 00:47:00    Canela   None
24     2018-09-15 16:08:00      None   None
25     2018-09-15 00:07:00      None   None
26     2018-09-15 16:17:00      Maya   None
27     2018-09-15 23:58:00    Mingus   None
```

```
28    2018-09-15 20:14:00       Derek    None
29    2018-09-15 23:25:00       Roscoe   pupper
30    2018-09-15 16:51:00        None    None
...                     ...         ...     ...
2326  2018-09-15 00:24:00        None    None
2327  2018-09-15 00:06:00        None    None
2328  2018-09-15 23:23:00        None    None
2329  2018-09-15 21:54:00        None    None
2330  2018-09-15 21:10:00        None    None
2331  2018-09-15 20:32:00        None    None
2332  2018-09-15 20:01:00        None    None
2333  2018-09-15 19:31:00        None    None
2334  2018-09-15 16:37:00        None    None
2335  2018-09-15 16:11:00        None    None
2336  2018-09-15 15:14:00        None    None
2337  2018-09-15 14:57:00        None    None
2338  2018-09-15 04:02:00        None    None
2339  2018-09-15 03:55:00        None    None
2340  2018-09-15 03:44:00        None    None
2341  2018-09-15 03:22:00        None    None
2342  2018-09-15 02:38:00        None    None
2343  2018-09-15 01:59:00        None    None
2344  2018-09-15 01:52:00        None    None
2345  2018-09-15 01:22:00        None    None
2346  2018-09-15 01:01:00        None    None
2347  2018-09-15 00:55:00        None    None
2348  2018-09-15 00:49:00        None    None
2349  2018-09-15 00:35:00        None    None
2350  2018-09-15 00:30:00        None    None
2351  2018-09-15 00:24:00        None    None
2352  2018-09-15 00:04:00        None    None
2353  2018-09-15 23:21:00        None    None
2354  2018-09-15 23:05:00        None    None
2355  2018-09-15 22:32:00        None    None

[2175 rows x 7 columns]

In [76]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 7 columns):
tweet_id             2175 non-null object
rating_numerator     2175 non-null float64
rating_denominator   2175 non-null float64
date                 2175 non-null datetime64[ns]
time                 2175 non-null datetime64[ns]
name                 2175 non-null object
```

```
stage                2175 non-null object
dtypes: datetime64[ns](2), float64(2), object(3)
memory usage: 135.9+ KB


In [77]: df_tweets_clean.info()

<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2175 entries, 1991-02-08 13:48:08.022790149 to 1998-04-12 22:37:23.555336193
Data columns (total 4 columns):
favorite_count    2175 non-null int64
tweet_id          2175 non-null object
retweet_count     2175 non-null int64
text              2175 non-null object
dtypes: int64(2), object(2)
memory usage: 85.0+ KB


In [78]: df_tweets_clean

Out[78]:                                 favorite_count          tweet_id  \
        1991-02-08 13:48:08.022790149            2529  666020888022790144
        1991-02-08 16:08:05.002620928             132  666029285002620928
        1991-02-08 17:16:52.701032449             128  666033412701032448
        1991-02-08 20:17:06.329800704             308  666044226329800704
        1991-02-08 21:40:48.165822465             111  666049248165822464
        1991-02-08 22:05:58.794694657             136  666050758794694656
        1991-02-08 22:24:13.826850816            1248  666051853826850816
        1991-02-08 23:25:25.042405380             448  666055525042405376
        1991-02-08 23:51:30.499244032             304  666057090499244032
        1991-02-09 00:16:40.524156928             117  666058600524156928
        1991-02-09 01:43:47.256086533             492  666063827256086528
        1991-02-09 03:46:33.221509120             154  666071193221509120
        1991-02-09 04:18:20.786774016             333  666073100786774016
        1991-02-09 07:01:56.733198337             121  666082916733198336
        1991-02-09 10:06:40.022159362             167  666094000022159360
        1991-02-09 11:38:33.787052032             161  666099513787052032
        1991-02-09 12:22:35.909144576              81  666102155909144576
        1991-02-09 12:55:33.288665088           14656  666104133288665088
        1991-02-11 10:41:50.803644416             108  666268910803644416
        1991-02-11 11:51:37.616637952             182  666273097616637952
        1991-02-11 15:50:06.224695296             152  666287406224695296
        1991-02-11 17:38:31.632134144             515  666293911632134144
        1991-02-12 05:51:22.303524864             203  666337882303524864
        1991-02-12 07:56:57.576210432             307  666345417576210432
        1991-02-12 10:08:08.456101888             228  666353288456101888
        1991-02-12 12:45:58.909284353             799  666362758909284352
        1991-02-12 15:49:13.744588802             194  666373753744588800
        1991-02-12 22:04:07.373291520             171  666396247373291520

                                      149
```

```
1991-02-13 01:05:26.856765440                113  666407126856765440
1991-02-13 02:18:27.551481857                457  666411507551481856
...                                          ...                 ...
1998-01-31 17:16:49.285017600                117  886267009285017600
1998-02-01 20:49:04.734445568              21435  886366144734445568
1998-02-05 12:05:36.477933568              22740  886680336477933568
1998-02-06 03:48:00.519319552              12250  886736880519319552
1998-02-09 00:13:53.522544640              35680  886983233522544640
1998-02-10 09:03:12.804085760              30972  887101392804085760
1998-02-13 04:13:37.045368832              34127  887343217045368832
1998-02-14 16:32:37.103951883              69815  887473957103951872
1998-02-15 04:32:19.158093824              46829  887517139158093824
1998-02-17 08:48:09.381826560              30616  887705289381826560
1998-02-21 16:27:14.458587136              22085  888078434458587136
1998-02-27 04:49:22.724278272              20217  888554962724278272
1998-03-02 02:16:29.199671297              25955  888804989199671296
1998-03-03 09:27:18.123831296              29484  888917238123831296
1998-03-07 13:54:01.981685760              25645  889278841981685760
1998-03-10 11:58:55.344209921              15302  889531135344209920
1998-03-11 17:53:57.579907072              27551  889638837579907072
1998-03-12 01:16:28.333682689              38626  889665388333682688
1998-03-14 13:08:16.479866881              28144  889880896479866880
1998-03-16 00:03:28.113172480              31031  890006608113172480
1998-03-18 16:57:35.349198849              32379  890240255349198848
1998-03-22 23:26:25.150312448              28137  890609185150312448
1998-03-24 08:46:21.411237888              66532  890729181411237888
1998-03-27 04:11:53.173991426              12031  890971913173991424
1998-03-28 12:25:50.875897856              20505  891087950875897856
1998-03-31 06:59:18.926688256              40903  891327558926688256
1998-04-04 11:32:37.279858688              42747  891689557279858688
1998-04-05 22:26:21.378084864              25395  891815181378084864
1998-04-10 03:03:41.306343426              33694  892177421306343424
1998-04-12 22:37:23.555336193              39370  892420643555336192

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1991-02-08 16:08:05.002620928                 47
1991-02-08 17:16:52.701032449                 46
1991-02-08 20:17:06.329800704                144
1991-02-08 21:40:48.165822465                 40
1991-02-08 22:05:58.794694657                 59
1991-02-08 22:24:13.826850816                874
1991-02-08 23:25:25.042405380                260
1991-02-08 23:51:30.499244032                145
1991-02-09 00:16:40.524156928                 60
1991-02-09 01:43:47.256086533                226
1991-02-09 03:46:33.221509120                 65
1991-02-09 04:18:20.786774016                172
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1991-02-09 07:01:56.733198337          46
1991-02-09 10:06:40.022159362          77
1991-02-09 11:38:33.787052032          72
1991-02-09 12:22:35.909144576          14
1991-02-09 12:55:33.288665088        6808
1991-02-11 10:41:50.803644416          36
1991-02-11 11:51:37.616637952          80
1991-02-11 15:50:06.224695296          70
1991-02-11 17:38:31.632134144         365
1991-02-12 05:51:22.303524864          95
1991-02-12 07:56:57.576210432         145
1991-02-12 10:08:08.456101888          74
1991-02-12 12:45:58.909284353         588
1991-02-12 15:49:13.744588802          95
1991-02-12 22:04:07.373291520          90
1991-02-13 01:05:26.856765440          42
1991-02-13 02:18:27.551481857         337
...                                    ...
1998-01-31 17:16:49.285017600           4
1998-02-01 20:49:04.734445568        3278
1998-02-05 12:05:36.477933568        4582
1998-02-06 03:48:00.519319552        3395
1998-02-09 00:13:53.522544640        7999
1998-02-10 09:03:12.804085760        6121
1998-02-13 04:13:37.045368832       10667
1998-02-14 16:32:37.103951883       18700
1998-02-15 04:32:19.158093824       11998
1998-02-17 08:48:09.381826560        5556
1998-02-21 16:27:14.458587136        3616
1998-02-27 04:49:22.724278272        3702
1998-03-02 02:16:29.199671297        4506
1998-03-03 09:27:18.123831296        4649
1998-03-07 13:54:01.981685760        5603
1998-03-10 11:58:55.344209921        2296
1998-03-11 17:53:57.579907072        4676
1998-03-12 01:16:28.333682689        8465
1998-03-14 13:08:16.479866881        5095
1998-03-16 00:03:28.113172480        7538
1998-03-18 16:57:35.349198849        7640
1998-03-22 23:26:25.150312448        4373
1998-03-24 08:46:21.411237888       19478
1998-03-27 04:11:53.173991426        2132
1998-03-28 12:25:50.875897856        3218
1998-03-31 06:59:18.926688256        9672
1998-04-04 11:32:37.279858688        8886
1998-04-05 22:26:21.378084864        4276
1998-04-10 03:03:41.306343426        6451
1998-04-12 22:37:23.555336193        8797
```

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                                                                       text
1991-02-08 13:48:08.022790149   Here we have a Japanese Irish Setter. Lost eye...
1991-02-08 16:08:05.002620928   This is a western brown Mitsubishi terrier. Up...
1991-02-08 17:16:52.701032449   Here is a very happy pup. Big fan of well-main...
1991-02-08 20:17:06.329800704   This is a purebred Piers Morgan. Loves to Netf...
1991-02-08 21:40:48.165822465   Here we have a 1949 1st generation vulpix. Enj...
1991-02-08 22:05:58.794694657   This is a truly beautiful English Wilson Staff...
1991-02-08 22:24:13.826850816   This is an odd dog. Hard on the outside but lo...
1991-02-08 23:25:25.042405380   Here is a Siberian heavily armored polar bear ...
1991-02-08 23:51:30.499244032   My oh my. This is a rare blond Canadian terrie...
1991-02-09 00:16:40.524156928   Here is the Rand Paul of retrievers folks! He'...
1991-02-09 01:43:47.256086533   This is the happiest dog you will ever see. Ve...
1991-02-09 03:46:33.221509120   Here we have a northern speckled Rhododendron...
1991-02-09 04:18:20.786774016   Let's hope this flight isn't Malaysian (lol). ...
1991-02-09 07:01:56.733198337   Here we have a well-established sunblockerspan...
1991-02-09 10:06:40.022159362   This appears to be a Mongolian Presbyterian mi...
1991-02-09 11:38:33.787052032   Can stand on stump for what seems like a while...
1991-02-09 12:22:35.909144576   Oh my. Here you are seeing an Adobe Setter giv...
1991-02-09 12:55:33.288665088   Not familiar with this breed. No tail (weird)...
1991-02-11 10:41:50.803644416   Very concerned about fellow dog trapped in com...
1991-02-11 11:51:37.616637952       Can take selfies 11/10 https://t.co/ws2AMaNwPW
1991-02-11 15:50:06.224695296   This is an Albanian 3 1/2 legged  Episcopalian...
1991-02-11 17:38:31.632134144   This is a funny dog. Weird toes. Won't come do...
1991-02-12 05:51:22.303524864   This is an extremely rare horned Parthenon. No...
1991-02-12 07:56:57.576210432   Look at this jokester thinking seat belt laws ...
1991-02-12 10:08:08.456101888   Here we have a mixed Asiago from the Galpagos...
1991-02-12 12:45:58.909284353   Unique dog here. Very small. Lives in containe...
1991-02-12 15:49:13.744588802   Those are sunglasses and a jean jacket. 11/10 ...
1991-02-12 22:04:07.373291520   Oh goodness. A super rare northeast Qdoba kang...
1991-02-13 01:05:26.856765440   This is a southern Vesuvius bumblegruff. Can d...
1991-02-13 02:18:27.551481857   This is quite the dog. Gets really excited whe...
...                                                                         ...
1998-01-31 17:16:49.285017600   @NonWhiteHat @MayhewMayhem omg hello tanner yo...
1998-02-01 20:49:04.734445568   This is Roscoe. Another pupper fallen victim t...
1998-02-05 12:05:36.477933568   This is Derek. He's late for a dog meeting. 13...
1998-02-06 03:48:00.519319552   This is Mingus. He's a wonderful father to his...
1998-02-09 00:13:53.522544640   This is Maya. She's very shy. Rarely leaves he...
1998-02-10 09:03:12.804085760   This... is a Jubilant Antarctic House Bear. We...
1998-02-13 04:13:37.045368832   You may not have known you needed to see this ...
1998-02-14 16:32:37.103951883   This is Canela. She attempted some fancy porch...
1998-02-15 04:32:19.158093824   I've yet to rate a Venezuelan Hover Wiener. Th...
1998-02-17 08:48:09.381826560   This is Jeffrey. He has a monopoly on the pool...
1998-02-21 16:27:14.458587136   This is Gerald. He was just told he didn't get...
1998-02-27 04:49:22.724278272   This is Ralphus. He's powering up. Attempting ...
1998-03-02 02:16:29.199671297   This is Zeke. He has a new stick. Very proud o...
1998-03-03 09:27:18.123831296   This is Jim. He found a fren. Taught him how t...
1998-03-07 13:54:01.981685760   This is Oliver. You're witnessing one of his m...
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152

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       1998-03-10 11:58:55.344209921   This is Stuart. He's sporting his favorite fan...
       1998-03-11 17:53:57.579907072   This is Ted. He does his best. Sometimes that'...
       1998-03-12 01:16:28.333682689   Here's a puppo that seems to be on the fence a...
       1998-03-14 13:08:16.479866881   This is Bruno. He is a service shark. Only get...
       1998-03-16 00:03:28.113172480   This is Koda. He is a South Australian decksha...
       1998-03-18 16:57:35.349198849   This is Cassie. She is a college pup. Studying...
       1998-03-22 23:26:25.150312448   This is Zoey. She doesn't want to be one of th...
       1998-03-24 08:46:21.411237888   When you watch your owner call another dog a g...
       1998-03-27 04:11:53.173991426   Meet Jax. He enjoys ice cream so much he gets ...
       1998-03-28 12:25:50.875897856   Here we have a majestic great white breaching ...
       1998-03-31 06:59:18.926688256   This is Franklin. He would like you to stop ca...
       1998-04-04 11:32:37.279858688   This is Darla. She commenced a snooze mid meal...
       1998-04-05 22:26:21.378084864   This is Archie. He is a rare Norwegian Pouncin...
       1998-04-10 03:03:41.306343426   This is Tilly. She's just checking pup on you...
       1998-04-12 22:37:23.555336193   This is Phineas. He's a mystical boy. Only eve...

       [2175 rows x 4 columns]

In [79]: type(df_clean['tweet_id'].iloc[0])

Out[79]: str

In [80]: df_clean.tweet_id = df_clean.tweet_id.astype(str)

In [81]: df_clean.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 7 columns):
tweet_id            2175 non-null object
rating_numerator    2175 non-null float64
rating_denominator  2175 non-null float64
date                2175 non-null datetime64[ns]
time                2175 non-null datetime64[ns]
name                2175 non-null object
stage               2175 non-null object
dtypes: datetime64[ns](2), float64(2), object(3)
memory usage: 135.9+ KB


In [82]: #combining archived twitter cleaned dataframe with twitter json dataframe then combinin
         # join on tweet_id and used inner join .

         twitter_archive_master = pd.merge(df_tweets_clean, images_clean,on='tweet_id', how='inn

In [83]: twitter_archive_master.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 1253 entries, 0 to 1252
```

```
Data columns (total 15 columns):
favorite_count     1253 non-null int64
tweet_id           1253 non-null object
retweet_count      1253 non-null int64
text               1253 non-null object
jpg_url            1253 non-null object
img_num            1253 non-null int64
p1                 1253 non-null object
p1_conf            1253 non-null float64
p1_dog             1253 non-null bool
p2                 1253 non-null object
p2_conf            1253 non-null float64
p2_dog             1253 non-null bool
p3                 1253 non-null object
p3_conf            1253 non-null float64
p3_dog             1253 non-null bool
dtypes: bool(3), float64(3), int64(3), object(6)
memory usage: 130.9+ KB


In [84]: twitter_archive_master

Out[84]:        favorite_count            tweet_id  retweet_count  \
        0                132  666029285002620928             47
        1                308  666044226329800704            144
        2               1248  666051853826850816            874
        3                304  666057090499244032            145
        4                117  666058600524156928             60
        5                154  666071193221509120             65
        6                333  666073100786774016            172
        7                161  666099513787052032             72
        8                 81  666102155909144576             14
        9              14656  666104133288665088           6808
        10               108  666268910803644416             36
        11               182  666273097616637952             80
        12               152  666287406224695296             70
        13               515  666293911632134144            365
        14               203  666337882303524864             95
        15               307  666345417576210432            145
        16               228  666353288456101888             74
        17               171  666396247373291520             90
        18               113  666407126856765440             42
        19               128  666418789513326592             47
        20               324  666421158376562688            117
        21               170  666428276349472768             89
        22               171  666435652385423360             54
        23               237  666644823164719104             87
        24               193  666691418707132416             50
```

25	447	666701168228331520	228
26	363	666776908487630848	184
27	401	666781792255496192	208
28	798	666786068205871104	517
29	249	666804364988780544	94
...	...	...	...
1223	28281	882627270321602560	6273
1224	28744	882762694511734784	5067
1225	24311	882992080364220416	4070
1226	37733	883117836046086144	6872
1227	46615	883482846933004288	10300
1228	27364	884441805382717440	5815
1229	24655	884562892145688576	5065
1230	22250	885167619883638784	4506
1231	36517	885528943205470208	6617
1232	33200	885984800019947520	7012
1233	21435	886366144734445568	3278
1234	22740	886680336477933568	4582
1235	12250	886736880519319552	3395
1236	35680	886983233522544640	7999
1237	30972	887101392804085760	6121
1238	34127	887343217045368832	10667
1239	46829	887517139158093824	11998
1240	30616	887705289381826560	5556
1241	22085	888078434458587136	3616
1242	20217	888554962724278272	3702
1243	29484	888917238123831296	4649
1244	25645	889278841981685760	5603
1245	27551	889638837579907072	4676
1246	31031	890006608113172480	7538
1247	28137	890609185150312448	4373
1248	66532	890729181411237888	19478
1249	20505	891087950875897856	3218
1250	40903	891327558926688256	9672
1251	42747	891689557279858688	8886
1252	25395	891815181378084864	4276

```
                                         text  \
0    This is a western brown Mitsubishi terrier. Up...
1    This is a purebred Piers Morgan. Loves to Netf...
2    This is an odd dog. Hard on the outside but lo...
3    My oh my. This is a rare blond Canadian terrie...
4    Here is the Rand Paul of retrievers folks! He'...
5    Here we have a northern speckled Rhododendron...
6    Let's hope this flight isn't Malaysian (lol). ...
7    Can stand on stump for what seems like a while...
8    Oh my. Here you are seeing an Adobe Setter giv...
9    Not familiar with this breed. No tail (weird)...
```

```
10    Very concerned about fellow dog trapped in com...
11      Can take selfies 11/10 https://t.co/ws2AMaNwPW
12    This is an Albanian 3 1/2 legged  Episcopalian...
13    This is a funny dog. Weird toes. Won't come do...
14    This is an extremely rare horned Parthenon. No...
15    Look at this jokester thinking seat belt laws ...
16    Here we have a mixed Asiago from the Galpagos...
17    Oh goodness. A super rare northeast Qdoba kang...
18    This is a southern Vesuvius bumblegruff. Can d...
19    This is Walter. He is an Alaskan Terrapin. Lov...
20    *internally screaming* 12/10 https://t.co/YMcr...
21    Here we have an Austrian Pulitzer. Collectors ...
22    "Can you behave? You're ruining my wedding day...
23    This is Jimothy. He is a Botwanian Gouda. Can ...
24    This is Christoper. He is a spotted Penne. Can...
25    This is a golden Buckminsterfullerene named Jo...
26    This is Josep. He is a Rye Manganese mix. Can ...
27    This is a purebred Bacardi named Octaviath. Ca...
28    Unfamiliar with this breed. Ears pointy af. Wo...
29    This is Jockson. He is a Pinnacle Sagittarius...
...                                              ...
1223  This is Stanley. He has his first swim lesson ...
1224  This is Gus. He's quite the cheeky pupper. Alr...
1225  This is Rusty. He wasn't ready for the first p...
1226  Please only send dogs. We don't rate mechanics...
1227  This is Bella. She hopes her smile made you sm...
1228  I present to you, Pup in Hat. Pup in Hat is gr...
1229  This is Kevin. He's just so happy. 13/10 what ...
1230  Here we have a corgi undercover as a malamute...
1231  This is Maisey. She fell asleep mid-excavation...
1232  Viewer discretion advised. This is Jimbo. He w...
1233  This is Roscoe. Another pupper fallen victim t...
1234  This is Derek. He's late for a dog meeting. 13...
1235  This is Mingus. He's a wonderful father to his...
1236  This is Maya. She's very shy. Rarely leaves he...
1237  This... is a Jubilant Antarctic House Bear. We...
1238  You may not have known you needed to see this ...
1239  I've yet to rate a Venezuelan Hover Wiener. Th...
1240  This is Jeffrey. He has a monopoly on the pool...
1241  This is Gerald. He was just told he didn't get...
1242  This is Ralphus. He's powering up. Attempting ...
1243  This is Jim. He found a fren. Taught him how t...
1244  This is Oliver. You're witnessing one of his m...
1245  This is Ted. He does his best. Sometimes that'...
1246  This is Koda. He is a South Australian decksha...
1247  This is Zoey. She doesn't want to be one of th...
1248  When you watch your owner call another dog a g...
1249  Here we have a majestic great white breaching ...
```

```
1250   This is Franklin. He would like you to stop ca...
1251   This is Darla. She commenced a snooze mid meal...
1252   This is Archie. He is a rare Norwegian Pouncin...

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1229     https://pbs.twimg.com/media/DEaZQkfXUAEC7qB.jpg        1
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1239	https://pbs.twimg.com/ext_tw_video_thumb/88751...	1
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1241	https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg	1
1242	https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg	3
1243	https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg	1
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1247	https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg	1
1248	https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg	2
1249	https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg	1
1250	https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg	2
1251	https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg	1
1252	https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg	1

	p1	p1_conf	p1_dog	p2 \
0	redbone	0.506826	True	miniature pinscher
1	Rhodesian ridgeback	0.408143	True	redbone
2	box turtle	0.933012	False	mud turtle
3	shopping cart	0.962465	False	shopping basket
4	miniature poodle	0.201493	True	komondor
5	Gordon setter	0.503672	True	Yorkshire terrier
6	Walker hound	0.260857	True	English foxhound
7	Lhasa	0.582330	True	Shih-Tzu
8	English setter	0.298617	True	Newfoundland
9	hen	0.965932	False	cock
10	desktop computer	0.086502	False	desk
11	Italian greyhound	0.176053	True	toy terrier
12	Maltese dog	0.857531	True	toy poodle
13	three-toed sloth	0.914671	False	otter
14	ox	0.416669	False	Newfoundland
15	golden retriever	0.858744	True	Chesapeake Bay retriever
16	malamute	0.336874	True	Siberian husky
17	Chihuahua	0.978108	True	toy terrier
18	black-and-tan coonhound	0.529139	True	bloodhound
19	toy terrier	0.149680	True	papillon
20	Blenheim spaniel	0.906777	True	cocker spaniel
21	Pembroke	0.371361	True	chow
22	Chesapeake Bay retriever	0.184130	True	chain saw
23	Ibizan hound	0.044333	True	Pembroke
24	German shepherd	0.975401	True	beagle
25	Labrador retriever	0.887707	True	Chihuahua
26	seat belt	0.375057	False	miniature pinscher
27	Italian greyhound	0.618316	True	Weimaraner

28	snail	0.999888	False	slug
29	English setter	0.328792	True	Brittany spaniel
...	...	...	...	...
1223	Pembroke	0.542982	True	Chihuahua
1224	Labrador retriever	0.850050	True	Chesapeake Bay retriever
1225	Eskimo dog	0.466778	True	Siberian husky
1226	golden retriever	0.949562	True	Labrador retriever
1227	golden retriever	0.943082	True	Labrador retriever
1228	Pembroke	0.993225	True	Cardigan
1229	pug	0.546406	True	French bulldog
1230	malamute	0.812482	True	Siberian husky
1231	pug	0.369275	True	Labrador retriever
1232	Blenheim spaniel	0.972494	True	Shih-Tzu
1233	French bulldog	0.999201	True	Chihuahua
1234	convertible	0.738995	False	sports car
1235	kuvasz	0.309706	True	Great Pyrenees
1236	Chihuahua	0.793469	True	toy terrier
1237	Samoyed	0.733942	True	Eskimo dog
1238	Mexican hairless	0.330741	True	sea lion
1239	limousine	0.130432	False	tow truck
1240	basset	0.821664	True	redbone
1241	French bulldog	0.995026	True	pug
1242	Siberian husky	0.700377	True	Eskimo dog
1243	golden retriever	0.714719	True	Tibetan mastiff
1244	whippet	0.626152	True	borzoi
1245	French bulldog	0.991650	True	boxer
1246	Samoyed	0.957979	True	Pomeranian
1247	Irish terrier	0.487574	True	Irish setter
1248	Pomeranian	0.566142	True	Eskimo dog
1249	Chesapeake Bay retriever	0.425595	True	Irish terrier
1250	basset	0.555712	True	English springer
1251	paper towel	0.170278	False	Labrador retriever
1252	Chihuahua	0.716012	True	malamute

	p2_conf	p2_dog	p3	p3_conf	p3_dog
0	0.074192	True	Rhodesian ridgeback	0.072010	True
1	0.360687	True	miniature pinscher	0.222752	True
2	0.045885	False	terrapin	0.017885	False
3	0.014594	False	golden retriever	0.007959	True
4	0.192305	True	soft-coated wheaten terrier	0.082086	True
5	0.174201	True	Pekinese	0.109454	True
6	0.175382	True	Ibizan hound	0.097471	True
7	0.166192	True	Dandie Dinmont	0.089688	True
8	0.149842	True	borzoi	0.133649	True
9	0.033919	False	partridge	0.000052	False
10	0.085547	False	bookcase	0.079480	False
11	0.111884	True	basenji	0.111152	True
12	0.063064	True	miniature poodle	0.025581	True

13	0.015250	False	great grey owl	0.013207	False
14	0.278407	True	groenendael	0.102643	True
15	0.054787	True	Labrador retriever	0.014241	True
16	0.147655	True	Eskimo dog	0.093412	True
17	0.009397	True	papillon	0.004577	True
18	0.244220	True	flat-coated retriever	0.173810	True
19	0.148258	True	Chihuahua	0.142860	True
20	0.090346	True	Shih-Tzu	0.001117	True
21	0.249394	True	Pomeranian	0.241878	True
22	0.056775	False	power drill	0.036763	False
23	0.043209	True	West Highland white terrier	0.038906	True
24	0.008687	True	bloodhound	0.005394	True
25	0.029307	True	French bulldog	0.020756	True
26	0.167175	True	Chihuahua	0.086951	True
27	0.151363	True	vizsla	0.085989	True
28	0.000055	False	acorn	0.000026	False
29	0.283545	True	Ibizan hound	0.057461	True
...	...	...	...	...	...
1223	0.251988	True	Cardigan	0.107699	True
1224	0.074257	True	flat-coated retriever	0.015579	True
1225	0.406044	True	dingo	0.073414	False
1226	0.045948	True	kuvasz	0.002471	True
1227	0.032409	True	kuvasz	0.005501	True
1228	0.003216	True	Chihuahua	0.002081	True
1229	0.404291	True	Brabancon griffon	0.044002	True
1230	0.071712	True	Eskimo dog	0.055770	True
1231	0.265835	True	kuvasz	0.134697	True
1232	0.006630	True	Bernese mountain dog	0.006239	True
1233	0.000361	True	Boston bull	0.000076	True
1234	0.139952	False	car wheel	0.044173	False
1235	0.186136	True	Dandie Dinmont	0.086346	True
1236	0.143528	True	can opener	0.032253	False
1237	0.035029	True	Staffordshire bullterrier	0.029705	True
1238	0.275645	False	Weimaraner	0.134203	True
1239	0.029175	False	shopping cart	0.026321	False
1240	0.087582	True	Weimaraner	0.026236	True
1241	0.000932	True	bull mastiff	0.000903	True
1242	0.166511	True	malamute	0.111411	True
1243	0.120184	True	Labrador retriever	0.105506	True
1244	0.194742	True	Saluki	0.027351	True
1245	0.002129	True	Staffordshire bullterrier	0.001498	True
1246	0.013884	True	chow	0.008167	True
1247	0.193054	True	Chesapeake Bay retriever	0.118184	True
1248	0.178406	True	Pembroke	0.076507	True
1249	0.116317	True	Indian elephant	0.076902	False
1250	0.225770	True	German short-haired pointer	0.175219	True
1251	0.168086	True	spatula	0.040836	False
1252	0.078253	True	kelpie	0.031379	True

```
          [1253 rows x 15 columns]

In [85]: twitter_archive_master = pd.merge(twitter_archive_master, df_clean,on='tweet_id', how='

In [86]: twitter_archive_master

Out[86]:         favorite_count              tweet_id  retweet_count  \
          0                 132  666029285002620928             47
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          3                 304  666057090499244032            145
          4                 117  666058600524156928             60
          5                 154  666071193221509120             65
          6                 333  666073100786774016            172
          7                 161  666099513787052032             72
          8                  81  666102155909144576             14
          9               14656  666104133288665088           6808
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          11                182  666273097616637952             80
          12                152  666287406224695296             70
          13                515  666293911632134144            365
          14                203  666337882303524864             95
          15                307  666345417576210432            145
          16                228  666353288456101888             74
          17                171  666396247373291520             90
          18                113  666407126856765440             42
          19                128  666418789513326592             47
          20                324  666421158376562688            117
          21                170  666428276349472768             89
          22                171  666435652385423360             54
          23                237  666644823164719104             87
          24                193  666691418707132416             50
          25                447  666701168228331520            228
          26                363  666776908487630848            184
          27                401  666781792255496192            208
          28                798  666786068205871104            517
          29                249  666804364988780544             94
          ...               ...                 ...            ...
          1223            28281  882627270321602560           6273
          1224            28744  882762694511734784           5067
          1225            24311  882992080364220416           4070
          1226            37733  883117836046086144           6872
          1227            46615  883482846933004288          10300
          1228            27364  884441805382717440           5815
          1229            24655  884562892145688576           5065
          1230            22250  885167619883638784           4506
          1231            36517  885528943205470208           6617
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1232        33200   885984800019947520          7012
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1237        30972   887101392804085760          6121
1238        34127   887343217045368832         10667
1239        46829   887517139158093824         11998
1240        30616   887705289381826560          5556
1241        22085   888078434458587136          3616
1242        20217   888554962724278272          3702
1243        29484   888917238123831296          4649
1244        25645   889278841981685760          5603
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1246        31031   890006608113172480          7538
1247        28137   890609185150312448          4373
1248        66532   890729181411237888         19478
1249        20505   891087950875897856          3218
1250        40903   891327558926688256          9672
1251        42747   891689557279858688          8886
1252        25395   891815181378084864          4276

                                                  text  \
0      This is a western brown Mitsubishi terrier. Up...
1      This is a purebred Piers Morgan. Loves to Netf...
2      This is an odd dog. Hard on the outside but lo...
3      My oh my. This is a rare blond Canadian terrie...
4      Here is the Rand Paul of retrievers folks! He'...
5      Here we have a northern speckled Rhododendron...
6      Let's hope this flight isn't Malaysian (lol). ...
7      Can stand on stump for what seems like a while...
8      Oh my. Here you are seeing an Adobe Setter giv...
9      Not familiar with this breed. No tail (weird)...
10     Very concerned about fellow dog trapped in com...
11        Can take selfies 11/10 https://t.co/ws2AMaNwPW
12     This is an Albanian 3 1/2 legged  Episcopalian...
13     This is a funny dog. Weird toes. Won't come do...
14     This is an extremely rare horned Parthenon. No...
15     Look at this jokester thinking seat belt laws ...
16     Here we have a mixed Asiago from the Galpagos...
17     Oh goodness. A super rare northeast Qdoba kang...
18     This is a southern Vesuvius bumblegruff. Can d...
19     This is Walter. He is an Alaskan Terrapin. Lov...
20     *internally screaming* 12/10 https://t.co/YMcr...
21     Here we have an Austrian Pulitzer. Collectors ...
22     "Can you behave? You're ruining my wedding day...
23     This is Jimothy. He is a Botwanian Gouda. Can ...
24     This is Christoper. He is a spotted Penne. Can...
```

```
25      This is a golden Buckminsterfullerene named Jo...
26      This is Josep. He is a Rye Manganese mix. Can ...
27      This is a purebred Bacardi named Octaviath. Ca...
28      Unfamiliar with this breed. Ears pointy af. Wo...
29      This is Jockson. He is a Pinnacle Sagittarius...
...                                                     ...
1223    This is Stanley. He has his first swim lesson ...
1224    This is Gus. He's quite the cheeky pupper. Alr...
1225    This is Rusty. He wasn't ready for the first p...
1226    Please only send dogs. We don't rate mechanics...
1227    This is Bella. She hopes her smile made you sm...
1228    I present to you, Pup in Hat. Pup in Hat is gr...
1229    This is Kevin. He's just so happy. 13/10 what ...
1230    Here we have a corgi undercover as a malamute...
1231    This is Maisey. She fell asleep mid-excavation...
1232    Viewer discretion advised. This is Jimbo. He w...
1233    This is Roscoe. Another pupper fallen victim t...
1234    This is Derek. He's late for a dog meeting. 13...
1235    This is Mingus. He's a wonderful father to his...
1236    This is Maya. She's very shy. Rarely leaves he...
1237    This... is a Jubilant Antarctic House Bear. We...
1238    You may not have known you needed to see this ...
1239    I've yet to rate a Venezuelan Hover Wiener. Th...
1240    This is Jeffrey. He has a monopoly on the pool...
1241    This is Gerald. He was just told he didn't get...
1242    This is Ralphus. He's powering up. Attempting ...
1243    This is Jim. He found a fren. Taught him how t...
1244    This is Oliver. You're witnessing one of his m...
1245    This is Ted. He does his best. Sometimes that'...
1246    This is Koda. He is a South Australian decksha...
1247    This is Zoey. She doesn't want to be one of th...
1248    When you watch your owner call another dog a g...
1249    Here we have a majestic great white breaching ...
1250    This is Franklin. He would like you to stop ca...
1251    This is Darla. She commenced a snooze mid meal...
1252    This is Archie. He is a rare Norwegian Pouncin...

                                               jpg_url  img_num  \
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1241	https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg	1
1242	https://pbs.twimg.com/media/DFTH_O-UQAACu2O.jpg	3
1243	https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg	1
1244	https://pbs.twimg.com/ext_tw_video_thumb/88927...	1
1245	https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg	1
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1247	https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg	1
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1249	https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg	1

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1251       https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg          1
1252       https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg          1


                               p1    p1_conf  p1_dog                        p2  \
0                         redbone   0.506826    True         miniature pinscher
1              Rhodesian ridgeback  0.408143    True                    redbone
2                       box turtle  0.933012   False                  mud turtle
3                    shopping cart  0.962465   False            shopping basket
4                  miniature poodle  0.201493    True                   komondor
5                     Gordon setter  0.503672    True           Yorkshire terrier
6                     Walker hound   0.260857    True           English foxhound
7                            Lhasa  0.582330    True                   Shih-Tzu
8                   English setter  0.298617    True               Newfoundland
9                              hen  0.965932   False                       cock
10              desktop computer    0.086502   False                       desk
11              Italian greyhound   0.176053    True                toy terrier
12                    Maltese dog   0.857531    True                 toy poodle
13                three-toed sloth  0.914671   False                      otter
14                              ox  0.416669   False               Newfoundland
15               golden retriever   0.858744    True   Chesapeake Bay retriever
16                        malamute  0.336874    True              Siberian husky
17                       Chihuahua  0.978108    True                toy terrier
18           black-and-tan coonhound 0.529139   True                  bloodhound
19                      toy terrier  0.149680    True                   papillon
20               Blenheim spaniel   0.906777    True              cocker spaniel
21                        Pembroke  0.371361    True                       chow
22        Chesapeake Bay retriever  0.184130    True                  chain saw
23                     Ibizan hound  0.044333    True                   Pembroke
24                 German shepherd  0.975401    True                     beagle
25              Labrador retriever  0.887707    True                  Chihuahua
26                       seat belt  0.375057   False         miniature pinscher
27              Italian greyhound   0.618316    True                 Weimaraner
28                           snail  0.999888   False                       slug
29                  English setter  0.328792    True            Brittany spaniel
...                           ...        ...     ...                        ...
1223                      Pembroke  0.542982    True                  Chihuahua
1224            Labrador retriever  0.850050    True   Chesapeake Bay retriever
1225                     Eskimo dog  0.466778    True              Siberian husky
1226              golden retriever  0.949562    True         Labrador retriever
1227              golden retriever  0.943082    True         Labrador retriever
1228                      Pembroke  0.993225    True                   Cardigan
1229                           pug  0.546406    True             French bulldog
1230                       malamute 0.812482    True              Siberian husky
1231                           pug  0.369275    True         Labrador retriever
1232               Blenheim spaniel 0.972494    True                   Shih-Tzu
1233               French bulldog   0.999201    True                  Chihuahua
1234                   convertible  0.738995   False                 sports car
```

165

1235	kuvasz	0.309706	True	Great Pyrenees
1236	Chihuahua	0.793469	True	toy terrier
1237	Samoyed	0.733942	True	Eskimo dog
1238	Mexican hairless	0.330741	True	sea lion
1239	limousine	0.130432	False	tow truck
1240	basset	0.821664	True	redbone
1241	French bulldog	0.995026	True	pug
1242	Siberian husky	0.700377	True	Eskimo dog
1243	golden retriever	0.714719	True	Tibetan mastiff
1244	whippet	0.626152	True	borzoi
1245	French bulldog	0.991650	True	boxer
1246	Samoyed	0.957979	True	Pomeranian
1247	Irish terrier	0.487574	True	Irish setter
1248	Pomeranian	0.566142	True	Eskimo dog
1249	Chesapeake Bay retriever	0.425595	True	Irish terrier
1250	basset	0.555712	True	English springer
1251	paper towel	0.170278	False	Labrador retriever
1252	Chihuahua	0.716012	True	malamute

	...	p2_dog	p3	p3_conf	p3_dog	\
0	...	True	Rhodesian ridgeback	0.072010	True	
1	...	True	miniature pinscher	0.222752	True	
2	...	False	terrapin	0.017885	False	
3	...	False	golden retriever	0.007959	True	
4	...	True	soft-coated wheaten terrier	0.082086	True	
5	...	True	Pekinese	0.109454	True	
6	...	True	Ibizan hound	0.097471	True	
7	...	True	Dandie Dinmont	0.089688	True	
8	...	True	borzoi	0.133649	True	
9	...	False	partridge	0.000052	False	
10	...	False	bookcase	0.079480	False	
11	...	True	basenji	0.111152	True	
12	...	True	miniature poodle	0.025581	True	
13	...	False	great grey owl	0.013207	False	
14	...	True	groenendael	0.102643	True	
15	...	True	Labrador retriever	0.014241	True	
16	...	True	Eskimo dog	0.093412	True	
17	...	True	papillon	0.004577	True	
18	...	True	flat-coated retriever	0.173810	True	
19	...	True	Chihuahua	0.142860	True	
20	...	True	Shih-Tzu	0.001117	True	
21	...	True	Pomeranian	0.241878	True	
22	...	False	power drill	0.036763	False	
23	...	True	West Highland white terrier	0.038906	True	
24	...	True	bloodhound	0.005394	True	
25	...	True	French bulldog	0.020756	True	
26	...	True	Chihuahua	0.086951	True	
27	...	True	vizsla	0.085989	True	

28	...	False	acorn	0.000026	False
29	...	True	Ibizan hound	0.057461	True
...	...	...	...	...	...
1223	...	True	Cardigan	0.107699	True
1224	...	True	flat-coated retriever	0.015579	True
1225	...	True	dingo	0.073414	False
1226	...	True	kuvasz	0.002471	True
1227	...	True	kuvasz	0.005501	True
1228	...	True	Chihuahua	0.002081	True
1229	...	True	Brabancon griffon	0.044002	True
1230	...	True	Eskimo dog	0.055770	True
1231	...	True	kuvasz	0.134697	True
1232	...	True	Bernese mountain dog	0.006239	True
1233	...	True	Boston bull	0.000076	True
1234	...	False	car wheel	0.044173	False
1235	...	True	Dandie Dinmont	0.086346	True
1236	...	True	can opener	0.032253	False
1237	...	True	Staffordshire bullterrier	0.029705	True
1238	...	False	Weimaraner	0.134203	True
1239	...	False	shopping cart	0.026321	False
1240	...	True	Weimaraner	0.026236	True
1241	...	True	bull mastiff	0.000903	True
1242	...	True	malamute	0.111411	True
1243	...	True	Labrador retriever	0.105506	True
1244	...	True	Saluki	0.027351	True
1245	...	True	Staffordshire bullterrier	0.001498	True
1246	...	True	chow	0.008167	True
1247	...	True	Chesapeake Bay retriever	0.118184	True
1248	...	True	Pembroke	0.076507	True
1249	...	True	Indian elephant	0.076902	False
1250	...	True	German short-haired pointer	0.175219	True
1251	...	True	spatula	0.040836	False
1252	...	True	kelpie	0.031379	True

	rating_numerator	rating_denominator	date	time \
0	7.0	10.0	2015-11-15	2018-09-15 23:05:00
1	6.0	10.0	2015-11-16	2018-09-15 00:04:00
2	2.0	10.0	2015-11-16	2018-09-15 00:35:00
3	9.0	10.0	2015-11-16	2018-09-15 00:55:00
4	8.0	10.0	2015-11-16	2018-09-15 01:01:00
5	9.0	10.0	2015-11-16	2018-09-15 01:52:00
6	10.0	10.0	2015-11-16	2018-09-15 01:59:00
7	8.0	10.0	2015-11-16	2018-09-15 03:44:00
8	11.0	10.0	2015-11-16	2018-09-15 03:55:00
9	1.0	10.0	2015-11-16	2018-09-15 04:02:00
10	10.0	10.0	2015-11-16	2018-09-15 14:57:00
11	11.0	10.0	2015-11-16	2018-09-15 15:14:00
12	1.0	2.0	2015-11-16	2018-09-15 16:11:00

13	3.0	10.0	2015-11-16	2018-09-15 16:37:00
14	9.0	10.0	2015-11-16	2018-09-15 19:31:00
15	10.0	10.0	2015-11-16	2018-09-15 20:01:00
16	8.0	10.0	2015-11-16	2018-09-15 20:32:00
17	9.0	10.0	2015-11-16	2018-09-15 23:23:00
18	7.0	10.0	2015-11-17	2018-09-15 00:06:00
19	10.0	10.0	2015-11-17	2018-09-15 00:53:00
20	12.0	10.0	2015-11-17	2018-09-15 01:02:00
21	7.0	10.0	2015-11-17	2018-09-15 01:30:00
22	10.0	10.0	2015-11-17	2018-09-15 02:00:00
23	9.0	10.0	2015-11-17	2018-09-15 15:51:00
24	8.0	10.0	2015-11-17	2018-09-15 18:56:00
25	8.0	10.0	2015-11-17	2018-09-15 19:35:00
26	5.0	10.0	2015-11-18	2018-09-15 00:36:00
27	10.0	10.0	2015-11-18	2018-09-15 00:55:00
28	2.0	10.0	2015-11-18	2018-09-15 01:12:00
29	8.0	10.0	2015-11-18	2018-09-15 02:25:00
...	...	...	...	...
1223	13.0	10.0	2017-07-05	2018-09-15 15:48:00
1224	12.0	10.0	2017-07-06	2018-09-15 00:46:00
1225	13.0	10.0	2017-07-06	2018-09-15 15:58:00
1226	13.0	10.0	2017-07-07	2018-09-15 00:17:00
1227	5.0	10.0	2017-07-08	2018-09-15 00:28:00
1228	14.0	10.0	2017-07-10	2018-09-15 15:58:00
1229	13.0	10.0	2017-07-11	2018-09-15 00:00:00
1230	13.0	10.0	2017-07-12	2018-09-15 16:03:00
1231	13.0	10.0	2017-07-13	2018-09-15 15:58:00
1232	12.0	10.0	2017-07-14	2018-09-15 22:10:00
1233	12.0	10.0	2017-07-15	2018-09-15 23:25:00
1234	13.0	10.0	2017-07-16	2018-09-15 20:14:00
1235	13.0	10.0	2017-07-16	2018-09-15 23:58:00
1236	13.0	10.0	2017-07-17	2018-09-15 16:17:00
1237	12.0	10.0	2017-07-18	2018-09-15 00:07:00
1238	13.0	10.0	2017-07-18	2018-09-15 16:08:00
1239	14.0	10.0	2017-07-19	2018-09-15 03:39:00
1240	13.0	10.0	2017-07-19	2018-09-15 16:06:00
1241	12.0	10.0	2017-07-20	2018-09-15 16:49:00
1242	13.0	10.0	2017-07-22	2018-09-15 00:23:00
1243	12.0	10.0	2017-07-23	2018-09-15 00:22:00
1244	13.0	10.0	2017-07-24	2018-09-15 00:19:00
1245	12.0	10.0	2017-07-25	2018-09-15 00:10:00
1246	13.0	10.0	2017-07-26	2018-09-15 00:31:00
1247	13.0	10.0	2017-07-27	2018-09-15 16:25:00
1248	13.0	10.0	2017-07-28	2018-09-15 00:22:00
1249	13.0	10.0	2017-07-29	2018-09-15 00:08:00
1250	12.0	10.0	2017-07-29	2018-09-15 16:00:00
1251	13.0	10.0	2017-07-30	2018-09-15 15:58:00
1252	12.0	10.0	2017-07-31	2018-09-15 00:18:00

	name	stage
0	None	None
1	None	None
2	None	None
3	None	None
4	None	None
5	None	None
6	None	None
7	None	None
8	None	None
9	None	None
10	None	None
11	None	None
12	None	None
13	None	None
14	None	None
15	None	None
16	None	None
17	None	None
18	None	None
19	Walter	None
20	None	None
21	None	None
22	None	None
23	Jimothy	None
24	Christoper	None
25	None	None
26	Josep	None
27	None	None
28	None	None
29	Jockson	None
...	...	...
1223	Stanley	None
1224	Gus	pupper
1225	Rusty	None
1226	None	None
1227	Bella	None
1228	None	None
1229	Kevin	None
1230	None	None
1231	Maisey	None
1232	Jimbo	None
1233	Roscoe	pupper
1234	Derek	None
1235	Mingus	None
1236	Maya	None
1237	None	None

```
1238           None    None
1239           None    None
1240        Jeffrey    None
1241         Gerald    None
1242        Ralphus    None
1243            Jim    None
1244         Oliver    None
1245            Ted    None
1246           Koda    None
1247           Zoey    None
1248           None    None
1249           None    None
1250       Franklin    None
1251          Darla    None
1252         Archie    None

[1253 rows x 21 columns]
```

In [87]: twitter_archive_master.info()

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1253 entries, 0 to 1252
Data columns (total 21 columns):
favorite_count       1253 non-null int64
tweet_id             1253 non-null object
retweet_count        1253 non-null int64
text                 1253 non-null object
jpg_url              1253 non-null object
img_num              1253 non-null int64
p1                   1253 non-null object
p1_conf              1253 non-null float64
p1_dog               1253 non-null bool
p2                   1253 non-null object
p2_conf              1253 non-null float64
p2_dog               1253 non-null bool
p3                   1253 non-null object
p3_conf              1253 non-null float64
p3_dog               1253 non-null bool
rating_numerator     1253 non-null float64
rating_denominator   1253 non-null float64
date                 1253 non-null datetime64[ns]
time                 1253 non-null datetime64[ns]
name                 1253 non-null object
stage                1253 non-null object
dtypes: bool(3), datetime64[ns](2), float64(5), int64(3), object(8)
memory usage: 189.7+ KB
```

54   Storing, Analyzing, and Visualizing Data-

save all the the cleaned up df's in a CSV file. Analyze and visualize your wrangled data in your wrangle_act.ipynb Jupyter Notebook. At least three (3) insights and one (1) visualization must be produced.

In [88]: *# saving all the cleaned dataframes into files and newly combined and joined dataframe*

```
twitter_archive_master.to_csv('twitter_archive_master.csv')
df_clean.to_csv('df_clean.csv')
df_tweets_clean.to_csv('df_tweets_clean.csv')
images_clean.to_csv('images_clean.csv')
```

In [89]: twitter_archive_master

Out[89]:

	favorite_count	tweet_id	retweet_count \
0	132	666029285002620928	47
1	308	666044226329800704	144
2	1248	666051853826850816	874
3	304	666057090499244032	145
4	117	666058600524156928	60
5	154	666071193221509120	65
6	333	666073100786774016	172
7	161	666099513787052032	72
8	81	666102155909144576	14
9	14656	666104133288665088	6808
10	108	666268910803644416	36
11	182	666273097616637952	80
12	152	666287406224695296	70
13	515	666293911632134144	365
14	203	666337882303524864	95
15	307	666345417576210432	145
16	228	666353288456101888	74
17	171	666396247373291520	90
18	113	666407126856765440	42
19	128	666418789513326592	47
20	324	666421158376562688	117
21	170	666428276349472768	89
22	171	666435652385423360	54
23	237	666644823164719104	87
24	193	666691418707132416	50
25	447	666701168228331520	228
26	363	666776908487630848	184
27	401	666781792255496192	208
28	798	666786068205871104	517
29	249	666804364988780544	94
...	...	...	...
1223	28281	882627270321602560	6273
1224	28744	882762694511734784	5067

171

```
1225          24311   882992080364220416          4070
1226          37733   883117836046086144          6872
1227          46615   883482846933004288         10300
1228          27364   884441805382717440          5815
1229          24655   884562892145688576          5065
1230          22250   885167619883638784          4506
1231          36517   885528943205470208          6617
1232          33200   885984800019947520          7012
1233          21435   886366144734445568          3278
1234          22740   886680336477933568          4582
1235          12250   886736880519319552          3395
1236          35680   886983233522544640          7999
1237          30972   887101392804085760          6121
1238          34127   887343217045368832         10667
1239          46829   887517139158093824         11998
1240          30616   887705289381826560          5556
1241          22085   888078434458587136          3616
1242          20217   888554962724278272          3702
1243          29484   888917238123831296          4649
1244          25645   889278841981685760          5603
1245          27551   889638837579907072          4676
1246          31031   890006608113172480          7538
1247          28137   890609185150312448          4373
1248          66532   890729181411237888         19478
1249          20505   891087950875897856          3218
1250          40903   891327558926688256          9672
1251          42747   891689557279858688          8886
1252          25395   891815181378084864          4276

                                                    text   \
0      This is a western brown Mitsubishi terrier. Up...
1      This is a purebred Piers Morgan. Loves to Netf...
2      This is an odd dog. Hard on the outside but lo...
3      My oh my. This is a rare blond Canadian terrie...
4      Here is the Rand Paul of retrievers folks! He'...
5      Here we have a northern speckled Rhododendron...
6      Let's hope this flight isn't Malaysian (lol). ...
7      Can stand on stump for what seems like a while...
8      Oh my. Here you are seeing an Adobe Setter giv...
9      Not familiar with this breed. No tail (weird)...
10     Very concerned about fellow dog trapped in com...
11        Can take selfies 11/10 https://t.co/ws2AMaNwPW
12     This is an Albanian 3 1/2 legged  Episcopalian...
13     This is a funny dog. Weird toes. Won't come do...
14     This is an extremely rare horned Parthenon. No...
15     Look at this jokester thinking seat belt laws ...
16     Here we have a mixed Asiago from the Galpagos...
17     Oh goodness. A super rare northeast Qdoba kang...
```

```
18      This is a southern Vesuvius bumblegruff. Can d...
19      This is Walter. He is an Alaskan Terrapin. Lov...
20      *internally screaming* 12/10 https://t.co/YMcr...
21      Here we have an Austrian Pulitzer. Collectors ...
22      "Can you behave? You're ruining my wedding day...
23      This is Jimothy. He is a Botwanian Gouda. Can ...
24      This is Christoper. He is a spotted Penne. Can...
25      This is a golden Buckminsterfullerene named Jo...
26      This is Josep. He is a Rye Manganese mix. Can ...
27      This is a purebred Bacardi named Octaviath. Ca...
28      Unfamiliar with this breed. Ears pointy af. Wo...
29      This is Jockson. He is a Pinnacle Sagittarius...
...                                                  ...
1223    This is Stanley. He has his first swim lesson ...
1224    This is Gus. He's quite the cheeky pupper. Alr...
1225    This is Rusty. He wasn't ready for the first p...
1226    Please only send dogs. We don't rate mechanics...
1227    This is Bella. She hopes her smile made you sm...
1228    I present to you, Pup in Hat. Pup in Hat is gr...
1229    This is Kevin. He's just so happy. 13/10 what ...
1230    Here we have a corgi undercover as a malamute...
1231    This is Maisey. She fell asleep mid-excavation...
1232    Viewer discretion advised. This is Jimbo. He w...
1233    This is Roscoe. Another pupper fallen victim t...
1234    This is Derek. He's late for a dog meeting. 13...
1235    This is Mingus. He's a wonderful father to his...
1236    This is Maya. She's very shy. Rarely leaves he...
1237    This... is a Jubilant Antarctic House Bear. We...
1238    You may not have known you needed to see this ...
1239    I've yet to rate a Venezuelan Hover Wiener. Th...
1240    This is Jeffrey. He has a monopoly on the pool...
1241    This is Gerald. He was just told he didn't get...
1242    This is Ralphus. He's powering up. Attempting ...
1243    This is Jim. He found a fren. Taught him how t...
1244    This is Oliver. You're witnessing one of his m...
1245    This is Ted. He does his best. Sometimes that'...
1246    This is Koda. He is a South Australian decksha...
1247    This is Zoey. She doesn't want to be one of th...
1248    When you watch your owner call another dog a g...
1249    Here we have a majestic great white breaching ...
1250    This is Franklin. He would like you to stop ca...
1251    This is Darla. She commenced a snooze mid meal...
1252    This is Archie. He is a rare Norwegian Pouncin...

                                            jpg_url  img_num  \
0       https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg        1
1       https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg        1
2       https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg        1
```

3	https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg	1
4	https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg	1
5	https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg	1
6	https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg	1
7	https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg	1
8	https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg	1
9	https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg	1
10	https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg	1
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12	https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg	1
13	https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg	1
14	https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg	1
15	https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg	1
16	https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg	1
17	https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg	1
18	https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg	1
19	https://pbs.twimg.com/media/CT-YWb7U8AA7QnN.jpg	1
20	https://pbs.twimg.com/media/CT-aggCXAAIMfT3.jpg	1
21	https://pbs.twimg.com/media/CT-g-ODUwAEQdSn.jpg	1
22	https://pbs.twimg.com/media/CT-nsTQWEAEkyDn.jpg	1
23	https://pbs.twimg.com/media/CUBl6IwVAAA9_zT.jpg	1
24	https://pbs.twimg.com/media/CUCQTpEWEAA7EDz.jpg	1
25	https://pbs.twimg.com/media/CUCZLHlUAAAeAig.jpg	1
26	https://pbs.twimg.com/media/CUDeDoWUYAAD-EM.jpg	1
27	https://pbs.twimg.com/media/CUDigRXXIAATI_H.jpg	1
28	https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg	1
29	https://pbs.twimg.com/media/CUD3A7YWoAA82NO.jpg	1
...	...	...
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1224	https://pbs.twimg.com/media/DEAz_HHXsAA-p_z.jpg	1
1225	https://pbs.twimg.com/media/DEEEnIqXYAAiJh_.jpg	1
1226	https://pbs.twimg.com/media/DEF2-_hXoAAs62q.jpg	2
1227	https://pbs.twimg.com/media/DELC9dZXUAADqUk.jpg	1
1228	https://pbs.twimg.com/media/DEYrIZwWsAA2Wo5.jpg	1
1229	https://pbs.twimg.com/media/DEaZQkfXUAEC7qB.jpg	1
1230	https://pbs.twimg.com/media/DEi_N9qXYAAgEEw.jpg	4
1231	https://pbs.twimg.com/media/DEoH3yvXgAAzQtS.jpg	1
1232	https://pbs.twimg.com/media/DEumeWWVOAA-Z61.jpg	1
1233	https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg	1
1234	https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg	1
1235	https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg	1
1236	https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg	2
1237	https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg	1
1238	https://pbs.twimg.com/ext_tw_video_thumb/88734...	1
1239	https://pbs.twimg.com/ext_tw_video_thumb/88751...	1
1240	https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg	1
1241	https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg	1
1242	https://pbs.twimg.com/media/DFTH_O-UQAACu2O.jpg	3

```
1243           https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg           1
1244    https://pbs.twimg.com/ext_tw_video_thumb/88927...           1
1245           https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg           1
1246           https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg           1
1247           https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg           1
1248           https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg           2
1249           https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg           1
1250           https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg           2
1251           https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg           1
1252           https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg           1
```

```
                               p1    p1_conf  p1_dog                        p2  \
0                         redbone   0.506826    True         miniature pinscher
1             Rhodesian ridgeback   0.408143    True                    redbone
2                       box turtle   0.933012   False                 mud turtle
3                    shopping cart   0.962465   False            shopping basket
4                  miniature poodle   0.201493    True                   komondor
5                    Gordon setter   0.503672    True           Yorkshire terrier
6                     Walker hound   0.260857    True            English foxhound
7                            Lhasa   0.582330    True                   Shih-Tzu
8                   English setter   0.298617    True                Newfoundland
9                              hen   0.965932   False                       cock
10               desktop computer   0.086502   False                       desk
11              Italian greyhound   0.176053    True                 toy terrier
12                     Maltese dog   0.857531    True                 toy poodle
13                three-toed sloth   0.914671   False                      otter
14                              ox   0.416669   False                Newfoundland
15                 golden retriever   0.858744    True    Chesapeake Bay retriever
16                         malamute   0.336874    True              Siberian husky
17                        Chihuahua   0.978108    True                 toy terrier
18            black-and-tan coonhound   0.529139    True                  bloodhound
19                      toy terrier   0.149680    True                    papillon
20                 Blenheim spaniel   0.906777    True               cocker spaniel
21                         Pembroke   0.371361    True                        chow
22        Chesapeake Bay retriever   0.184130    True                    chain saw
23                     Ibizan hound   0.044333    True                    Pembroke
24                 German shepherd   0.975401    True                      beagle
25                Labrador retriever   0.887707    True                   Chihuahua
26                        seat belt   0.375057   False         miniature pinscher
27              Italian greyhound   0.618316    True                  Weimaraner
28                            snail   0.999888   False                        slug
29                  English setter   0.328792    True            Brittany spaniel
...                            ...        ...     ...                         ...
1223                      Pembroke   0.542982    True                   Chihuahua
1224               Labrador retriever   0.850050    True    Chesapeake Bay retriever
1225                     Eskimo dog   0.466778    True              Siberian husky
1226                 golden retriever   0.949562    True          Labrador retriever
1227                 golden retriever   0.943082    True          Labrador retriever
```

	p1	p1_conf	p1_dog	p2
1228	Pembroke	0.993225	True	Cardigan
1229	pug	0.546406	True	French bulldog
1230	malamute	0.812482	True	Siberian husky
1231	pug	0.369275	True	Labrador retriever
1232	Blenheim spaniel	0.972494	True	Shih-Tzu
1233	French bulldog	0.999201	True	Chihuahua
1234	convertible	0.738995	False	sports car
1235	kuvasz	0.309706	True	Great Pyrenees
1236	Chihuahua	0.793469	True	toy terrier
1237	Samoyed	0.733942	True	Eskimo dog
1238	Mexican hairless	0.330741	True	sea lion
1239	limousine	0.130432	False	tow truck
1240	basset	0.821664	True	redbone
1241	French bulldog	0.995026	True	pug
1242	Siberian husky	0.700377	True	Eskimo dog
1243	golden retriever	0.714719	True	Tibetan mastiff
1244	whippet	0.626152	True	borzoi
1245	French bulldog	0.991650	True	boxer
1246	Samoyed	0.957979	True	Pomeranian
1247	Irish terrier	0.487574	True	Irish setter
1248	Pomeranian	0.566142	True	Eskimo dog
1249	Chesapeake Bay retriever	0.425595	True	Irish terrier
1250	basset	0.555712	True	English springer
1251	paper towel	0.170278	False	Labrador retriever
1252	Chihuahua	0.716012	True	malamute

	...	p2_dog	p3	p3_conf	p3_dog	\
0	...	True	Rhodesian ridgeback	0.072010	True	
1	...	True	miniature pinscher	0.222752	True	
2	...	False	terrapin	0.017885	False	
3	...	False	golden retriever	0.007959	True	
4	...	True	soft-coated wheaten terrier	0.082086	True	
5	...	True	Pekinese	0.109454	True	
6	...	True	Ibizan hound	0.097471	True	
7	...	True	Dandie Dinmont	0.089688	True	
8	...	True	borzoi	0.133649	True	
9	...	False	partridge	0.000052	False	
10	...	False	bookcase	0.079480	False	
11	...	True	basenji	0.111152	True	
12	...	True	miniature poodle	0.025581	True	
13	...	False	great grey owl	0.013207	False	
14	...	True	groenendael	0.102643	True	
15	...	True	Labrador retriever	0.014241	True	
16	...	True	Eskimo dog	0.093412	True	
17	...	True	papillon	0.004577	True	
18	...	True	flat-coated retriever	0.173810	True	
19	...	True	Chihuahua	0.142860	True	
20	...	True	Shih-Tzu	0.001117	True	

21	...	True	Pomeranian	0.241878	True
22	...	False	power drill	0.036763	False
23	...	True	West Highland white terrier	0.038906	True
24	...	True	bloodhound	0.005394	True
25	...	True	French bulldog	0.020756	True
26	...	True	Chihuahua	0.086951	True
27	...	True	vizsla	0.085989	True
28	...	False	acorn	0.000026	False
29	...	True	Ibizan hound	0.057461	True
...	...	...	...	...	...
1223	...	True	Cardigan	0.107699	True
1224	...	True	flat-coated retriever	0.015579	True
1225	...	True	dingo	0.073414	False
1226	...	True	kuvasz	0.002471	True
1227	...	True	kuvasz	0.005501	True
1228	...	True	Chihuahua	0.002081	True
1229	...	True	Brabancon griffon	0.044002	True
1230	...	True	Eskimo dog	0.055770	True
1231	...	True	kuvasz	0.134697	True
1232	...	True	Bernese mountain dog	0.006239	True
1233	...	True	Boston bull	0.000076	True
1234	...	False	car wheel	0.044173	False
1235	...	True	Dandie Dinmont	0.086346	True
1236	...	True	can opener	0.032253	False
1237	...	True	Staffordshire bullterrier	0.029705	True
1238	...	False	Weimaraner	0.134203	True
1239	...	False	shopping cart	0.026321	False
1240	...	True	Weimaraner	0.026236	True
1241	...	True	bull mastiff	0.000903	True
1242	...	True	malamute	0.111411	True
1243	...	True	Labrador retriever	0.105506	True
1244	...	True	Saluki	0.027351	True
1245	...	True	Staffordshire bullterrier	0.001498	True
1246	...	True	chow	0.008167	True
1247	...	True	Chesapeake Bay retriever	0.118184	True
1248	...	True	Pembroke	0.076507	True
1249	...	True	Indian elephant	0.076902	False
1250	...	True	German short-haired pointer	0.175219	True
1251	...	True	spatula	0.040836	False
1252	...	True	kelpie	0.031379	True

	rating_numerator	rating_denominator	date	time \
0	7.0	10.0	2015-11-15	2018-09-15 23:05:00
1	6.0	10.0	2015-11-16	2018-09-15 00:04:00
2	2.0	10.0	2015-11-16	2018-09-15 00:35:00
3	9.0	10.0	2015-11-16	2018-09-15 00:55:00
4	8.0	10.0	2015-11-16	2018-09-15 01:01:00
5	9.0	10.0	2015-11-16	2018-09-15 01:52:00

6	10.0	10.0	2015-11-16	2018-09-15	01:59:00
7	8.0	10.0	2015-11-16	2018-09-15	03:44:00
8	11.0	10.0	2015-11-16	2018-09-15	03:55:00
9	1.0	10.0	2015-11-16	2018-09-15	04:02:00
10	10.0	10.0	2015-11-16	2018-09-15	14:57:00
11	11.0	10.0	2015-11-16	2018-09-15	15:14:00
12	1.0	2.0	2015-11-16	2018-09-15	16:11:00
13	3.0	10.0	2015-11-16	2018-09-15	16:37:00
14	9.0	10.0	2015-11-16	2018-09-15	19:31:00
15	10.0	10.0	2015-11-16	2018-09-15	20:01:00
16	8.0	10.0	2015-11-16	2018-09-15	20:32:00
17	9.0	10.0	2015-11-16	2018-09-15	23:23:00
18	7.0	10.0	2015-11-17	2018-09-15	00:06:00
19	10.0	10.0	2015-11-17	2018-09-15	00:53:00
20	12.0	10.0	2015-11-17	2018-09-15	01:02:00
21	7.0	10.0	2015-11-17	2018-09-15	01:30:00
22	10.0	10.0	2015-11-17	2018-09-15	02:00:00
23	9.0	10.0	2015-11-17	2018-09-15	15:51:00
24	8.0	10.0	2015-11-17	2018-09-15	18:56:00
25	8.0	10.0	2015-11-17	2018-09-15	19:35:00
26	5.0	10.0	2015-11-18	2018-09-15	00:36:00
27	10.0	10.0	2015-11-18	2018-09-15	00:55:00
28	2.0	10.0	2015-11-18	2018-09-15	01:12:00
29	8.0	10.0	2015-11-18	2018-09-15	02:25:00
...	...	...	...		...
1223	13.0	10.0	2017-07-05	2018-09-15	15:48:00
1224	12.0	10.0	2017-07-06	2018-09-15	00:46:00
1225	13.0	10.0	2017-07-06	2018-09-15	15:58:00
1226	13.0	10.0	2017-07-07	2018-09-15	00:17:00
1227	5.0	10.0	2017-07-08	2018-09-15	00:28:00
1228	14.0	10.0	2017-07-10	2018-09-15	15:58:00
1229	13.0	10.0	2017-07-11	2018-09-15	00:00:00
1230	13.0	10.0	2017-07-12	2018-09-15	16:03:00
1231	13.0	10.0	2017-07-13	2018-09-15	15:58:00
1232	12.0	10.0	2017-07-14	2018-09-15	22:10:00
1233	12.0	10.0	2017-07-15	2018-09-15	23:25:00
1234	13.0	10.0	2017-07-16	2018-09-15	20:14:00
1235	13.0	10.0	2017-07-16	2018-09-15	23:58:00
1236	13.0	10.0	2017-07-17	2018-09-15	16:17:00
1237	12.0	10.0	2017-07-18	2018-09-15	00:07:00
1238	13.0	10.0	2017-07-18	2018-09-15	16:08:00
1239	14.0	10.0	2017-07-19	2018-09-15	03:39:00
1240	13.0	10.0	2017-07-19	2018-09-15	16:06:00
1241	12.0	10.0	2017-07-20	2018-09-15	16:49:00
1242	13.0	10.0	2017-07-22	2018-09-15	00:23:00
1243	12.0	10.0	2017-07-23	2018-09-15	00:22:00
1244	13.0	10.0	2017-07-24	2018-09-15	00:19:00
1245	12.0	10.0	2017-07-25	2018-09-15	00:10:00

```
1246                   13.0              10.0 2017-07-26 2018-09-15 00:31:00
1247                   13.0              10.0 2017-07-27 2018-09-15 16:25:00
1248                   13.0              10.0 2017-07-28 2018-09-15 00:22:00
1249                   13.0              10.0 2017-07-29 2018-09-15 00:08:00
1250                   12.0              10.0 2017-07-29 2018-09-15 16:00:00
1251                   13.0              10.0 2017-07-30 2018-09-15 15:58:00
1252                   12.0              10.0 2017-07-31 2018-09-15 00:18:00

              name    stage
0             None    None
1             None    None
2             None    None
3             None    None
4             None    None
5             None    None
6             None    None
7             None    None
8             None    None
9             None    None
10            None    None
11            None    None
12            None    None
13            None    None
14            None    None
15            None    None
16            None    None
17            None    None
18            None    None
19          Walter    None
20            None    None
21            None    None
22            None    None
23         Jimothy    None
24      Christoper    None
25            None    None
26           Josep    None
27            None    None
28            None    None
29         Jockson    None
...            ...     ...
1223       Stanley    None
1224           Gus  pupper
1225         Rusty    None
1226          None    None
1227         Bella    None
1228          None    None
1229         Kevin    None
1230          None    None
```

```
1231      Maisey      None
1232       Jimbo      None
1233      Roscoe    pupper
1234       Derek      None
1235      Mingus      None
1236        Maya      None
1237        None      None
1238        None      None
1239        None      None
1240     Jeffrey      None
1241      Gerald      None
1242     Ralphus      None
1243         Jim      None
1244      Oliver      None
1245         Ted      None
1246        Koda      None
1247        Zoey      None
1248        None      None
1249        None      None
1250    Franklin      None
1251       Darla      None
1252      Archie      None

[1253 rows x 21 columns]
```

In [90]: twitter_archive_master.describe()

Out[90]:   favorite_count   retweet_count   img_num   p1_conf   p2_conf \
       count   1253.000000   1253.000000   1253.000000   1253.000000   1.253000e+03
       mean   7767.709497   2317.924980   1.185954   0.586124   1.364630e-01
       std   10426.720864   3383.676314   0.538956   0.274958   1.016470e-01
       min   81.000000   14.000000   1.000000   0.044333   1.011300e-08
       25%   1663.000000   576.000000   1.000000   0.352547   5.443110e-02
       50%   3721.000000   1246.000000   1.000000   0.575637   1.198050e-01
       75%   9574.000000   2741.000000   1.000000   0.837448   1.978610e-01
       max   93873.000000   33100.000000   4.000000   1.000000   4.676780e-01

                   p3_conf   rating_numerator   rating_denominator
       count   1.253000e+03   1253.000000   1253.000000
       mean   6.138274e-02   12.885874   10.565842
       std   5.199768e-02   52.077868   8.017145
       min   1.740170e-10   1.000000   2.000000
       25%   1.648340e-02   10.000000   10.000000
       50%   4.990060e-02   11.000000   10.000000
       75%   9.452260e-02   12.000000   10.000000
       max   2.710420e-01   1776.000000   170.000000
```

55   Insight # 1 -

56   Define Lets find lowest rated dogs -

code - below

```
In [91]: twitter_archive_master[twitter_archive_master['rating_numerator']==1]

Out[91]:      favorite_count              tweet_id  retweet_count  \
        9             14656  666104133288665088           6808
        12              152  666287406224695296             70
        63             6086  667549055577362432           2438
        327            6025  675153376133427200           2710


                                                        text  \
        9     Not familiar with this breed. No tail (weird)...
        12    This is an Albanian 3 1/2 legged  Episcopalian...
        63    Never seen dog like this. Breathes heavy. Tilt...
        327   What kind of person sends in a picture without...


                                          jpg_url  img_num          p1  \
        9    https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg        1         hen
        12   https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg        1  Maltese dog
        63   https://pbs.twimg.com/media/CUOcVCwWsAERUKY.jpg        1  electric fan
        327  https://pbs.twimg.com/media/CV6gaUUWEAAnETq.jpg        1  paper towel


               p1_conf  p1_dog        p2  ...    p2_dog               p3  p3_conf  \
        9     0.965932  False       cock  ...     False        partridge  0.000052
        12    0.857531   True  toy poodle  ...      True  miniature poodle  0.025581
        63    0.984377  False   spotlight  ...     False         lampshade  0.001901
        327   0.327957  False     mailbox  ...     False         seat belt  0.034995


               p3_dog  rating_numerator  rating_denominator        date  \
        9       False               1.0                10.0  2015-11-16
        12       True               1.0                 2.0  2015-11-16
        63      False               1.0                10.0  2015-11-20
        327     False               1.0                10.0  2015-12-11


                            time  name  stage
        9    2018-09-15 04:02:00  None  None
        12   2018-09-15 16:11:00  None  None
        63   2018-09-15 03:44:00  None  None
        327  2018-09-15 03:21:00  None  None


        [4 rows x 21 columns]

In [92]: print(twitter_archive_master.loc[twitter_archive_master.rating_numerator == 1, 'jpg_url
```

```
9        https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg
12       https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg
63       https://pbs.twimg.com/media/CUOcVCwWsAERUKY.jpg
327      https://pbs.twimg.com/media/CV6gaUUWEAAnETq.jpg
Name: jpg_url, dtype: object
```

57 2 pics are wrong - fan and hen .

58 Insights # 2 & visual # 1

59 Define - ratings vs time & favorites_counts , retweets_count vs time plots .

60 code below

```
In [93]: twitter_archive_master.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 1253 entries, 0 to 1252
Data columns (total 21 columns):
favorite_count       1253 non-null int64
tweet_id             1253 non-null object
retweet_count        1253 non-null int64
text                 1253 non-null object
jpg_url              1253 non-null object
img_num              1253 non-null int64
p1                   1253 non-null object
p1_conf              1253 non-null float64
p1_dog               1253 non-null bool
p2                   1253 non-null object
p2_conf              1253 non-null float64
p2_dog               1253 non-null bool
p3                   1253 non-null object
p3_conf              1253 non-null float64
p3_dog               1253 non-null bool
rating_numerator     1253 non-null float64
rating_denominator   1253 non-null float64
date                 1253 non-null datetime64[ns]
time                 1253 non-null datetime64[ns]
name                 1253 non-null object
stage                1253 non-null object
dtypes: bool(3), datetime64[ns](2), float64(5), int64(3), object(8)
memory usage: 189.7+ KB


In [94]: twitter_archive_master.set_index('date', inplace=True)
```
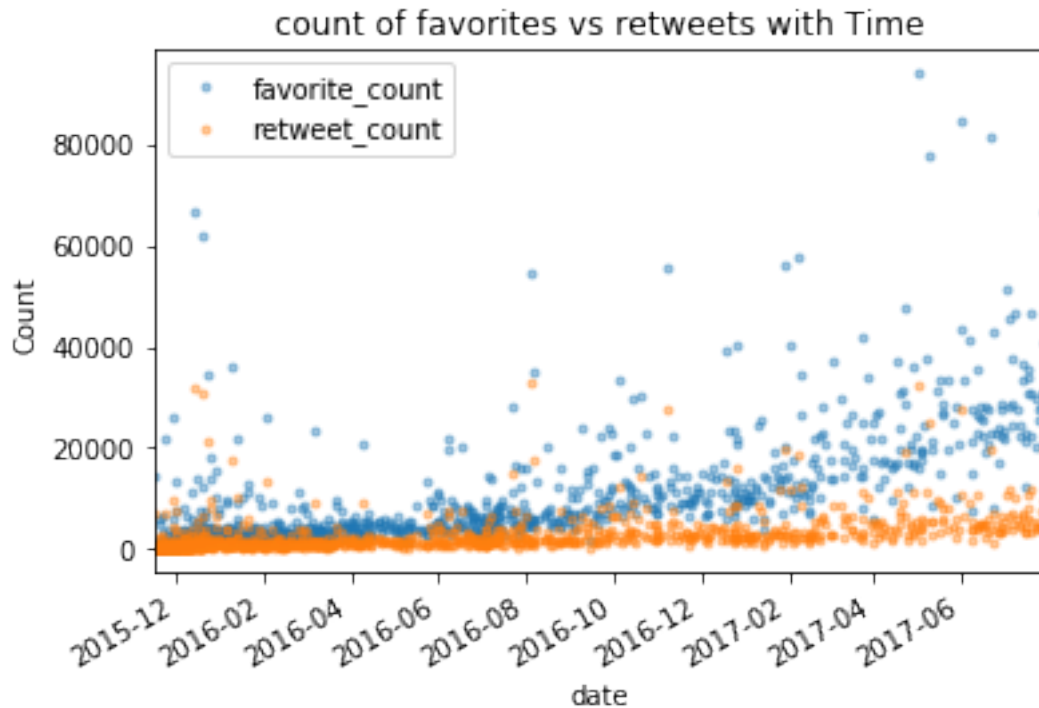
```
In [95]: twitter_archive_master[['favorite_count', 'retweet_count']].plot(style = '.', alpha = 0
         plt.title('count of favorites vs retweets with Time')
         plt.xlabel('date')
         plt.ylabel('Count');
```


61 favorite and retweet counts increases with time .

```
In [96]: twitter_archive_master['rating']=twitter_archive_master['rating_numerator'] / twitter_a

In [97]: twitter_archive_master

Out[97]:             favorite_count           tweet_id  retweet_count  \
         date
         2015-11-15             132  666029285002620928            47
         2015-11-16             308  666044226329800704           144
         2015-11-16            1248  666051853826850816           874
         2015-11-16             304  666057090499244032           145
         2015-11-16             117  666058600524156928            60
         2015-11-16             154  666071193221509120            65
         2015-11-16             333  666073100786774016           172
         2015-11-16             161  666099513787052032            72
         2015-11-16              81  666102155909144576            14
         2015-11-16           14656  666104133288665088          6808
```

183

2015-11-16	108	666268910803644416	36
2015-11-16	182	666273097616637952	80
2015-11-16	152	666287406224695296	70
2015-11-16	515	666293911632134144	365
2015-11-16	203	666337882303524864	95
2015-11-16	307	666345417576210432	145
2015-11-16	228	666353288456101888	74
2015-11-16	171	666396247373291520	90
2015-11-17	113	666407126856765440	42
2015-11-17	128	666418789513326592	47
2015-11-17	324	666421158376562688	117
2015-11-17	170	666428276349472768	89
2015-11-17	171	666435652385423360	54
2015-11-17	237	666644823164719104	87
2015-11-17	193	666691418707132416	50
2015-11-17	447	666701168228331520	228
2015-11-18	363	666776908487630848	184
2015-11-18	401	666781792255496192	208
2015-11-18	798	666786068205871104	517
2015-11-18	249	666804364988780544	94
...	...	...	...
2017-07-05	28281	882627270321602560	6273
2017-07-06	28744	882762694511734784	5067
2017-07-06	24311	882992080364220416	4070
2017-07-07	37733	883117836046086144	6872
2017-07-08	46615	883482846933004288	10300
2017-07-10	27364	884441805382717440	5815
2017-07-11	24655	884562892145688576	5065
2017-07-12	22250	885167619883638784	4506
2017-07-13	36517	885528943205470208	6617
2017-07-14	33200	885984800019947520	7012
2017-07-15	21435	886366144734445568	3278
2017-07-16	22740	886680336477933568	4582
2017-07-16	12250	886736880519319552	3395
2017-07-17	35680	886983233522544640	7999
2017-07-18	30972	887101392804085760	6121
2017-07-18	34127	887343217045368832	10667
2017-07-19	46829	887517139158093824	11998
2017-07-19	30616	887705289381826560	5556
2017-07-20	22085	888078434458587136	3616
2017-07-22	20217	888554962724278272	3702
2017-07-23	29484	888917238123831296	4649
2017-07-24	25645	889278841981685760	5603
2017-07-25	27551	889638837579907072	4676
2017-07-26	31031	890006608113172480	7538
2017-07-27	28137	890609185150312448	4373
2017-07-28	66532	890729181411237888	19478
2017-07-29	20505	891087950875897856	3218

```
2017-07-29              40903  891327558926688256           9672
2017-07-30              42747  891689557279858688           8886
2017-07-31              25395  891815181378084864           4276

                                                          text  \
date
2015-11-15  This is a western brown Mitsubishi terrier. Up...
2015-11-16  This is a purebred Piers Morgan. Loves to Netf...
2015-11-16  This is an odd dog. Hard on the outside but lo...
2015-11-16  My oh my. This is a rare blond Canadian terrie...
2015-11-16  Here is the Rand Paul of retrievers folks! He'...
2015-11-16  Here we have a northern speckled Rhododendron...
2015-11-16  Let's hope this flight isn't Malaysian (lol). ...
2015-11-16  Can stand on stump for what seems like a while...
2015-11-16  Oh my. Here you are seeing an Adobe Setter giv...
2015-11-16  Not familiar with this breed. No tail (weird)...
2015-11-16  Very concerned about fellow dog trapped in com...
2015-11-16     Can take selfies 11/10 https://t.co/ws2AMaNwPW
2015-11-16  This is an Albanian 3 1/2 legged  Episcopalian...
2015-11-16  This is a funny dog. Weird toes. Won't come do...
2015-11-16  This is an extremely rare horned Parthenon. No...
2015-11-16  Look at this jokester thinking seat belt laws ...
2015-11-16  Here we have a mixed Asiago from the Galpagos...
2015-11-16  Oh goodness. A super rare northeast Qdoba kang...
2015-11-17  This is a southern Vesuvius bumblegruff. Can d...
2015-11-17  This is Walter. He is an Alaskan Terrapin. Lov...
2015-11-17  *internally screaming* 12/10 https://t.co/YMcr...
2015-11-17  Here we have an Austrian Pulitzer. Collectors ...
2015-11-17  "Can you behave? You're ruining my wedding day...
2015-11-17  This is Jimothy. He is a Botwanian Gouda. Can ...
2015-11-17  This is Christoper. He is a spotted Penne. Can...
2015-11-17  This is a golden Buckminsterfullerene named Jo...
2015-11-18  This is Josep. He is a Rye Manganese mix. Can ...
2015-11-18  This is a purebred Bacardi named Octaviath. Ca...
2015-11-18  Unfamiliar with this breed. Ears pointy af. Wo...
2015-11-18  This is Jockson. He is a Pinnacle Sagittarius...
...                                                       ...
2017-07-05  This is Stanley. He has his first swim lesson ...
2017-07-06  This is Gus. He's quite the cheeky pupper. Alr...
2017-07-06  This is Rusty. He wasn't ready for the first p...
2017-07-07  Please only send dogs. We don't rate mechanics...
2017-07-08  This is Bella. She hopes her smile made you sm...
2017-07-10  I present to you, Pup in Hat. Pup in Hat is gr...
2017-07-11  This is Kevin. He's just so happy. 13/10 what ...
2017-07-12  Here we have a corgi undercover as a malamute...
2017-07-13  This is Maisey. She fell asleep mid-excavation...
2017-07-14  Viewer discretion advised. This is Jimbo. He w...
2017-07-15  This is Roscoe. Another pupper fallen victim t...
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2017-07-16    This is Derek. He's late for a dog meeting. 13...
2017-07-16    This is Mingus. He's a wonderful father to his...
2017-07-17    This is Maya. She's very shy. Rarely leaves he...
2017-07-18    This... is a Jubilant Antarctic House Bear. We...
2017-07-18    You may not have known you needed to see this ...
2017-07-19    I've yet to rate a Venezuelan Hover Wiener. Th...
2017-07-19    This is Jeffrey. He has a monopoly on the pool...
2017-07-20    This is Gerald. He was just told he didn't get...
2017-07-22    This is Ralphus. He's powering up. Attempting ...
2017-07-23    This is Jim. He found a fren. Taught him how t...
2017-07-24    This is Oliver. You're witnessing one of his m...
2017-07-25    This is Ted. He does his best. Sometimes that'...
2017-07-26    This is Koda. He is a South Australian decksha...
2017-07-27    This is Zoey. She doesn't want to be one of th...
2017-07-28    When you watch your owner call another dog a g...
2017-07-29    Here we have a majestic great white breaching ...
2017-07-29    This is Franklin. He would like you to stop ca...
2017-07-30    This is Darla. She commenced a snooze mid meal...
2017-07-31    This is Archie. He is a rare Norwegian Pouncin...

                                                  jpg_url  img_num  \
date
2015-11-15      https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9cxOtUEAAhNN_.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg        1
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2015-11-17      https://pbs.twimg.com/media/CT-nsTQWEAEkyDn.jpg        1
2015-11-17      https://pbs.twimg.com/media/CUBl6IwVAAA9_zT.jpg        1
2015-11-17      https://pbs.twimg.com/media/CUCQTpEWEAA7EDz.jpg        1
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2015-11-18      https://pbs.twimg.com/media/CUDeDoWUYAAD-EM.jpg         1
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2015-11-18      https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg         1
2015-11-18      https://pbs.twimg.com/media/CUD3A7YWoAA82N0.jpg         1
...                                                          ...      ...
2017-07-05      https://pbs.twimg.com/media/DD-40X3WAAAJPU5.jpg         1
2017-07-06      https://pbs.twimg.com/media/DEAz_HHXsAA-p_z.jpg         1
2017-07-06      https://pbs.twimg.com/media/DEEEnIqXYAAiJh_.jpg         1
2017-07-07      https://pbs.twimg.com/media/DEF2-_hXoAAs62q.jpg         2
2017-07-08      https://pbs.twimg.com/media/DELC9dZXUAADqUk.jpg         1
2017-07-10      https://pbs.twimg.com/media/DEYrIZwWsAA2Wo5.jpg         1
2017-07-11      https://pbs.twimg.com/media/DEaZQkfXUAEC7qB.jpg         1
2017-07-12      https://pbs.twimg.com/media/DEi_N9qXYAAgEEw.jpg         4
2017-07-13      https://pbs.twimg.com/media/DEoH3yvXgAAzQtS.jpg         1
2017-07-14      https://pbs.twimg.com/media/DEumeWWVOAA-Z61.jpg         1
2017-07-15      https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg         1
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2017-07-16      https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg         1
2017-07-17      https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg         2
2017-07-18      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg         1
2017-07-18  https://pbs.twimg.com/ext_tw_video_thumb/88734...         1
2017-07-19  https://pbs.twimg.com/ext_tw_video_thumb/88751...         1
2017-07-19      https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg         1
2017-07-20      https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg         1
2017-07-22      https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg         3
2017-07-23      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg         1
2017-07-24  https://pbs.twimg.com/ext_tw_video_thumb/88927...         1
2017-07-25      https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg         1
2017-07-26      https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg         1
2017-07-27      https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg         1
2017-07-28      https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg         2
2017-07-29      https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg         1
2017-07-29      https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg         2
2017-07-30      https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg         1
2017-07-31      https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg         1


                              p1    p1_conf  p1_dog  \
date
2015-11-15                redbone   0.506826    True
2015-11-16      Rhodesian ridgeback   0.408143    True
2015-11-16              box turtle   0.933012   False
2015-11-16           shopping cart   0.962465   False
2015-11-16         miniature poodle   0.201493    True
2015-11-16            Gordon setter   0.503672    True
2015-11-16            Walker hound   0.260857    True
2015-11-16                   Lhasa   0.582330    True
2015-11-16           English setter   0.298617    True
2015-11-16                     hen   0.965932   False
```

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2015-11-16            desktop computer  0.086502     False
2015-11-16            Italian greyhound  0.176053      True
2015-11-16                  Maltese dog  0.857531      True
2015-11-16             three-toed sloth  0.914671     False
2015-11-16                           ox  0.416669     False
2015-11-16             golden retriever  0.858744      True
2015-11-16                     malamute  0.336874      True
2015-11-16                    Chihuahua  0.978108      True
2015-11-17       black-and-tan coonhound  0.529139      True
2015-11-17                  toy terrier  0.149680      True
2015-11-17              Blenheim spaniel  0.906777      True
2015-11-17                     Pembroke  0.371361      True
2015-11-17      Chesapeake Bay retriever  0.184130      True
2015-11-17                  Ibizan hound  0.044333      True
2015-11-17              German shepherd  0.975401      True
2015-11-17            Labrador retriever  0.887707      True
2015-11-18                     seat belt  0.375057     False
2015-11-18            Italian greyhound  0.618316      True
2015-11-18                        snail  0.999888     False
2015-11-18                English setter  0.328792      True
...                             ...       ...        ...
2017-07-05                     Pembroke  0.542982      True
2017-07-06            Labrador retriever  0.850050      True
2017-07-06                    Eskimo dog  0.466778      True
2017-07-07             golden retriever  0.949562      True
2017-07-08             golden retriever  0.943082      True
2017-07-10                     Pembroke  0.993225      True
2017-07-11                           pug  0.546406      True
2017-07-12                     malamute  0.812482      True
2017-07-13                           pug  0.369275      True
2017-07-14              Blenheim spaniel  0.972494      True
2017-07-15                French bulldog  0.999201      True
2017-07-16                   convertible  0.738995     False
2017-07-16                       kuvasz  0.309706      True
2017-07-17                    Chihuahua  0.793469      True
2017-07-18                      Samoyed  0.733942      True
2017-07-18             Mexican hairless  0.330741      True
2017-07-19                     limousine  0.130432     False
2017-07-19                       basset  0.821664      True
2017-07-20                French bulldog  0.995026      True
2017-07-22                Siberian husky  0.700377      True
2017-07-23             golden retriever  0.714719      True
2017-07-24                       whippet  0.626152      True
2017-07-25                French bulldog  0.991650      True
2017-07-26                      Samoyed  0.957979      True
2017-07-27                 Irish terrier  0.487574      True
2017-07-28                    Pomeranian  0.566142      True
2017-07-29      Chesapeake Bay retriever  0.425595      True
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2017-07-29                             basset  0.555712    True
2017-07-30                        paper towel  0.170278   False
2017-07-31                          Chihuahua  0.716012    True

                                        p2  ...    p2_dog  \
date                                        ...
2015-11-15              miniature pinscher  ...      True
2015-11-16                         redbone  ...      True
2015-11-16                      mud turtle  ...     False
2015-11-16                 shopping basket  ...     False
2015-11-16                        komondor  ...      True
2015-11-16               Yorkshire terrier  ...      True
2015-11-16                 English foxhound  ...      True
2015-11-16                        Shih-Tzu  ...      True
2015-11-16                    Newfoundland  ...      True
2015-11-16                            cock  ...     False
2015-11-16                            desk  ...     False
2015-11-16                     toy terrier  ...      True
2015-11-16                      toy poodle  ...      True
2015-11-16                           otter  ...     False
2015-11-16                    Newfoundland  ...      True
2015-11-16        Chesapeake Bay retriever  ...      True
2015-11-16                   Siberian husky  ...      True
2015-11-16                     toy terrier  ...      True
2015-11-17                      bloodhound  ...      True
2015-11-17                        papillon  ...      True
2015-11-17                   cocker spaniel  ...      True
2015-11-17                            chow  ...      True
2015-11-17                       chain saw  ...     False
2015-11-17                        Pembroke  ...      True
2015-11-17                          beagle  ...      True
2015-11-17                       Chihuahua  ...      True
2015-11-18              miniature pinscher  ...      True
2015-11-18                      Weimaraner  ...      True
2015-11-18                            slug  ...     False
2015-11-18                 Brittany spaniel  ...      True
...                                      ...  ...       ...
2017-07-05                       Chihuahua  ...      True
2017-07-06        Chesapeake Bay retriever  ...      True
2017-07-06                   Siberian husky  ...      True
2017-07-07               Labrador retriever  ...      True
2017-07-08               Labrador retriever  ...      True
2017-07-10                        Cardigan  ...      True
2017-07-11                   French bulldog  ...      True
2017-07-12                   Siberian husky  ...      True
2017-07-13               Labrador retriever  ...      True
2017-07-14                        Shih-Tzu  ...      True
2017-07-15                       Chihuahua  ...      True
```

2017-07-16	sports car	...	False
2017-07-16	Great Pyrenees	...	True
2017-07-17	toy terrier	...	True
2017-07-18	Eskimo dog	...	True
2017-07-18	sea lion	...	False
2017-07-19	tow truck	...	False
2017-07-19	redbone	...	True
2017-07-20	pug	...	True
2017-07-22	Eskimo dog	...	True
2017-07-23	Tibetan mastiff	...	True
2017-07-24	borzoi	...	True
2017-07-25	boxer	...	True
2017-07-26	Pomeranian	...	True
2017-07-27	Irish setter	...	True
2017-07-28	Eskimo dog	...	True
2017-07-29	Irish terrier	...	True
2017-07-29	English springer	...	True
2017-07-30	Labrador retriever	...	True
2017-07-31	malamute	...	True

date	p3	p3_conf	p3_dog	rating_numerator \
2015-11-15	Rhodesian ridgeback	0.072010	True	7.0
2015-11-16	miniature pinscher	0.222752	True	6.0
2015-11-16	terrapin	0.017885	False	2.0
2015-11-16	golden retriever	0.007959	True	9.0
2015-11-16	soft-coated wheaten terrier	0.082086	True	8.0
2015-11-16	Pekinese	0.109454	True	9.0
2015-11-16	Ibizan hound	0.097471	True	10.0
2015-11-16	Dandie Dinmont	0.089688	True	8.0
2015-11-16	borzoi	0.133649	True	11.0
2015-11-16	partridge	0.000052	False	1.0
2015-11-16	bookcase	0.079480	False	10.0
2015-11-16	basenji	0.111152	True	11.0
2015-11-16	miniature poodle	0.025581	True	1.0
2015-11-16	great grey owl	0.013207	False	3.0
2015-11-16	groenendael	0.102643	True	9.0
2015-11-16	Labrador retriever	0.014241	True	10.0
2015-11-16	Eskimo dog	0.093412	True	8.0
2015-11-16	papillon	0.004577	True	9.0
2015-11-17	flat-coated retriever	0.173810	True	7.0
2015-11-17	Chihuahua	0.142860	True	10.0
2015-11-17	Shih-Tzu	0.001117	True	12.0
2015-11-17	Pomeranian	0.241878	True	7.0
2015-11-17	power drill	0.036763	False	10.0
2015-11-17	West Highland white terrier	0.038906	True	9.0
2015-11-17	bloodhound	0.005394	True	8.0
2015-11-17	French bulldog	0.020756	True	8.0

date				
2015-11-18	Chihuahua	0.086951	True	5.0
2015-11-18	vizsla	0.085989	True	10.0
2015-11-18	acorn	0.000026	False	2.0
2015-11-18	Ibizan hound	0.057461	True	8.0
...	...	...	...	...
2017-07-05	Cardigan	0.107699	True	13.0
2017-07-06	flat-coated retriever	0.015579	True	12.0
2017-07-06	dingo	0.073414	False	13.0
2017-07-07	kuvasz	0.002471	True	13.0
2017-07-08	kuvasz	0.005501	True	5.0
2017-07-10	Chihuahua	0.002081	True	14.0
2017-07-11	Brabancon griffon	0.044002	True	13.0
2017-07-12	Eskimo dog	0.055770	True	13.0
2017-07-13	kuvasz	0.134697	True	13.0
2017-07-14	Bernese mountain dog	0.006239	True	12.0
2017-07-15	Boston bull	0.000076	True	12.0
2017-07-16	car wheel	0.044173	False	13.0
2017-07-16	Dandie Dinmont	0.086346	True	13.0
2017-07-17	can opener	0.032253	False	13.0
2017-07-18	Staffordshire bullterrier	0.029705	True	12.0
2017-07-18	Weimaraner	0.134203	True	13.0
2017-07-19	shopping cart	0.026321	False	14.0
2017-07-19	Weimaraner	0.026236	True	13.0
2017-07-20	bull mastiff	0.000903	True	12.0
2017-07-22	malamute	0.111411	True	13.0
2017-07-23	Labrador retriever	0.105506	True	12.0
2017-07-24	Saluki	0.027351	True	13.0
2017-07-25	Staffordshire bullterrier	0.001498	True	12.0
2017-07-26	chow	0.008167	True	13.0
2017-07-27	Chesapeake Bay retriever	0.118184	True	13.0
2017-07-28	Pembroke	0.076507	True	13.0
2017-07-29	Indian elephant	0.076902	False	13.0
2017-07-29	German short-haired pointer	0.175219	True	12.0
2017-07-30	spatula	0.040836	False	13.0
2017-07-31	kelpie	0.031379	True	12.0

date	rating_denominator	time	name	stage	rating
2015-11-15	10.0	2018-09-15 23:05:00	None	None	0.7
2015-11-16	10.0	2018-09-15 00:04:00	None	None	0.6
2015-11-16	10.0	2018-09-15 00:35:00	None	None	0.2
2015-11-16	10.0	2018-09-15 00:55:00	None	None	0.9
2015-11-16	10.0	2018-09-15 01:01:00	None	None	0.8
2015-11-16	10.0	2018-09-15 01:52:00	None	None	0.9
2015-11-16	10.0	2018-09-15 01:59:00	None	None	1.0
2015-11-16	10.0	2018-09-15 03:44:00	None	None	0.8
2015-11-16	10.0	2018-09-15 03:55:00	None	None	1.1
2015-11-16	10.0	2018-09-15 04:02:00	None	None	0.1

2015-11-16	10.0	2018-09-15 14:57:00	None	None	1.0
2015-11-16	10.0	2018-09-15 15:14:00	None	None	1.1
2015-11-16	2.0	2018-09-15 16:11:00	None	None	0.5
2015-11-16	10.0	2018-09-15 16:37:00	None	None	0.3
2015-11-16	10.0	2018-09-15 19:31:00	None	None	0.9
2015-11-16	10.0	2018-09-15 20:01:00	None	None	1.0
2015-11-16	10.0	2018-09-15 20:32:00	None	None	0.8
2015-11-16	10.0	2018-09-15 23:23:00	None	None	0.9
2015-11-17	10.0	2018-09-15 00:06:00	None	None	0.7
2015-11-17	10.0	2018-09-15 00:53:00	Walter	None	1.0
2015-11-17	10.0	2018-09-15 01:02:00	None	None	1.2
2015-11-17	10.0	2018-09-15 01:30:00	None	None	0.7
2015-11-17	10.0	2018-09-15 02:00:00	None	None	1.0
2015-11-17	10.0	2018-09-15 15:51:00	Jimothy	None	0.9
2015-11-17	10.0	2018-09-15 18:56:00	Christoper	None	0.8
2015-11-17	10.0	2018-09-15 19:35:00	None	None	0.8
2015-11-18	10.0	2018-09-15 00:36:00	Josep	None	0.5
2015-11-18	10.0	2018-09-15 00:55:00	None	None	1.0
2015-11-18	10.0	2018-09-15 01:12:00	None	None	0.2
2015-11-18	10.0	2018-09-15 02:25:00	Jockson	None	0.8
...	...	...	...	...	...
2017-07-05	10.0	2018-09-15 15:48:00	Stanley	None	1.3
2017-07-06	10.0	2018-09-15 00:46:00	Gus	pupper	1.2
2017-07-06	10.0	2018-09-15 15:58:00	Rusty	None	1.3
2017-07-07	10.0	2018-09-15 00:17:00	None	None	1.3
2017-07-08	10.0	2018-09-15 00:28:00	Bella	None	0.5
2017-07-10	10.0	2018-09-15 15:58:00	None	None	1.4
2017-07-11	10.0	2018-09-15 00:00:00	Kevin	None	1.3
2017-07-12	10.0	2018-09-15 16:03:00	None	None	1.3
2017-07-13	10.0	2018-09-15 15:58:00	Maisey	None	1.3
2017-07-14	10.0	2018-09-15 22:10:00	Jimbo	None	1.2
2017-07-15	10.0	2018-09-15 23:25:00	Roscoe	pupper	1.2
2017-07-16	10.0	2018-09-15 20:14:00	Derek	None	1.3
2017-07-16	10.0	2018-09-15 23:58:00	Mingus	None	1.3
2017-07-17	10.0	2018-09-15 16:17:00	Maya	None	1.3
2017-07-18	10.0	2018-09-15 00:07:00	None	None	1.2
2017-07-18	10.0	2018-09-15 16:08:00	None	None	1.3
2017-07-19	10.0	2018-09-15 03:39:00	None	None	1.4
2017-07-19	10.0	2018-09-15 16:06:00	Jeffrey	None	1.3
2017-07-20	10.0	2018-09-15 16:49:00	Gerald	None	1.2
2017-07-22	10.0	2018-09-15 00:23:00	Ralphus	None	1.3
2017-07-23	10.0	2018-09-15 00:22:00	Jim	None	1.2
2017-07-24	10.0	2018-09-15 00:19:00	Oliver	None	1.3
2017-07-25	10.0	2018-09-15 00:10:00	Ted	None	1.2
2017-07-26	10.0	2018-09-15 00:31:00	Koda	None	1.3
2017-07-27	10.0	2018-09-15 16:25:00	Zoey	None	1.3
2017-07-28	10.0	2018-09-15 00:22:00	None	None	1.3
2017-07-29	10.0	2018-09-15 00:08:00	None	None	1.3

```
2017-07-29                        10.0 2018-09-15 16:00:00     Franklin    None     1.2
2017-07-30                        10.0 2018-09-15 15:58:00       Darla     None     1.3
2017-07-31                        10.0 2018-09-15 00:18:00      Archie     None     1.2

[1253 rows x 21 columns]
```

In [98]: twitter_archive_master.info()

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 1253 entries, 2015-11-15 to 2017-07-31
Data columns (total 21 columns):
favorite_count       1253 non-null int64
tweet_id             1253 non-null object
retweet_count        1253 non-null int64
text                 1253 non-null object
jpg_url              1253 non-null object
img_num              1253 non-null int64
p1                   1253 non-null object
p1_conf              1253 non-null float64
p1_dog               1253 non-null bool
p2                   1253 non-null object
p2_conf              1253 non-null float64
p2_dog               1253 non-null bool
p3                   1253 non-null object
p3_conf              1253 non-null float64
p3_dog               1253 non-null bool
rating_numerator     1253 non-null float64
rating_denominator   1253 non-null float64
time                 1253 non-null datetime64[ns]
name                 1253 non-null object
stage                1253 non-null object
rating               1253 non-null float64
dtypes: bool(3), datetime64[ns](1), float64(6), int64(3), object(8)
memory usage: 229.7+ KB
```

In [99]: twitter_archive_master.plot(y ='rating_numerator', ylim=[0,14], style = '.', alpha = 0.
        plt.title('Rating with Time')
        plt.xlabel('date')
        plt.ylabel('rating');

Rating with Time

```
In [100]:  # rating gradually increases over time .
           #Below is the perason correlation for favorites , retweet and rating _ numerator.

In [101]:  twitter_archive_master[['favorite_count', 'retweet_count','rating_numerator']].corr(me

Out[101]:                    favorite_count   retweet_count   rating_numerator
           favorite_count          1.000000        0.915874           0.017996
           retweet_count           0.915874        1.000000           0.027699
           rating_numerator        0.017996        0.027699           1.000000

In [102]:  dog_type = []

           x = ['pupper', 'puppo', 'doggo', 'floof']
           y = ['pupper', 'puppo', 'doggo', 'floof']

           for row in twitter_archive_master['text']:
               row = row.lower()
               for word in x:
                   if word in str(row):
                       dog_type.append(y[x.index(word)])
                       break
               else:
                   dog_type.append('None')

           twitter_archive_master['dog_type'] = dog_type
```

```
In [103]: twitter_archive_master

Out[103]:              favorite_count          tweet_id  retweet_count  \
          date
          2015-11-15             132  666029285002620928             47
          2015-11-16             308  666044226329800704            144
          2015-11-16            1248  666051853826850816            874
          2015-11-16             304  666057090499244032            145
          2015-11-16             117  666058600524156928             60
          2015-11-16             154  666071193221509120             65
          2015-11-16             333  666073100786774016            172
          2015-11-16             161  666099513787052032             72
          2015-11-16              81  666102155909144576             14
          2015-11-16           14656  666104133288665088           6808
          2015-11-16             108  666268910803644416             36
          2015-11-16             182  666273097616637952             80
          2015-11-16             152  666287406224695296             70
          2015-11-16             515  666293911632134144            365
          2015-11-16             203  666337882303524864             95
          2015-11-16             307  666345417576210432            145
          2015-11-16             228  666353288456101888             74
          2015-11-16             171  666396247373291520             90
          2015-11-17             113  666407126856765440             42
          2015-11-17             128  666418789513326592             47
          2015-11-17             324  666421158376562688            117
          2015-11-17             170  666428276349472768             89
          2015-11-17             171  666435652385423360             54
          2015-11-17             237  666644823164719104             87
          2015-11-17             193  666691418707132416             50
          2015-11-17             447  666701168228331520            228
          2015-11-18             363  666776908487630848            184
          2015-11-18             401  666781792255496192            208
          2015-11-18             798  666786068205871104            517
          2015-11-18             249  666804364988780544             94
          ...                    ...                 ...            ...
          2017-07-05           28281  882627270321602560           6273
          2017-07-06           28744  882762694511734784           5067
          2017-07-06           24311  882992080364220416           4070
          2017-07-07           37733  883117836046086144           6872
          2017-07-08           46615  883482846933004288          10300
          2017-07-10           27364  884441805382717440           5815
          2017-07-11           24655  884562892145688576           5065
          2017-07-12           22250  885167619883638784           4506
          2017-07-13           36517  885528943205470208           6617
          2017-07-14           33200  885984800019947520           7012
          2017-07-15           21435  886366144734445568           3278
          2017-07-16           22740  886680336477933568           4582
          2017-07-16           12250  886736880519319552           3395
```

date			
2017-07-17	35680	886983233522544640	7999
2017-07-18	30972	887101392804085760	6121
2017-07-18	34127	887343217045368832	10667
2017-07-19	46829	887517139158093824	11998
2017-07-19	30616	887705289381826560	5556
2017-07-20	22085	888078434458587136	3616
2017-07-22	20217	888554962724278272	3702
2017-07-23	29484	888917238123831296	4649
2017-07-24	25645	889278841981685760	5603
2017-07-25	27551	889638837579907072	4676
2017-07-26	31031	890006608113172480	7538
2017-07-27	28137	890609185150312448	4373
2017-07-28	66532	890729181411237888	19478
2017-07-29	20505	891087950875897856	3218
2017-07-29	40903	891327558926688256	9672
2017-07-30	42747	891689557279858688	8886
2017-07-31	25395	891815181378084864	4276

```
                                                               text  \
date
2015-11-15  This is a western brown Mitsubishi terrier. Up...
2015-11-16  This is a purebred Piers Morgan. Loves to Netf...
2015-11-16  This is an odd dog. Hard on the outside but lo...
2015-11-16  My oh my. This is a rare blond Canadian terrie...
2015-11-16  Here is the Rand Paul of retrievers folks! He'...
2015-11-16  Here we have a northern speckled Rhododendron...
2015-11-16  Let's hope this flight isn't Malaysian (lol). ...
2015-11-16  Can stand on stump for what seems like a while...
2015-11-16  Oh my. Here you are seeing an Adobe Setter giv...
2015-11-16  Not familiar with this breed. No tail (weird)...
2015-11-16  Very concerned about fellow dog trapped in com...
2015-11-16      Can take selfies 11/10 https://t.co/ws2AMaNwPW
2015-11-16  This is an Albanian 3 1/2 legged  Episcopalian...
2015-11-16  This is a funny dog. Weird toes. Won't come do...
2015-11-16  This is an extremely rare horned Parthenon. No...
2015-11-16  Look at this jokester thinking seat belt laws ...
2015-11-16  Here we have a mixed Asiago from the Galpagos...
2015-11-16  Oh goodness. A super rare northeast Qdoba kang...
2015-11-17  This is a southern Vesuvius bumblegruff. Can d...
2015-11-17  This is Walter. He is an Alaskan Terrapin. Lov...
2015-11-17  *internally screaming* 12/10 https://t.co/YMcr...
2015-11-17  Here we have an Austrian Pulitzer. Collectors ...
2015-11-17  "Can you behave? You're ruining my wedding day...
2015-11-17  This is Jimothy. He is a Botwanian Gouda. Can ...
2015-11-17  This is Christoper. He is a spotted Penne. Can...
2015-11-17  This is a golden Buckminsterfullerene named Jo...
2015-11-18  This is Josep. He is a Rye Manganese mix. Can ...
2015-11-18  This is a purebred Bacardi named Octaviath. Ca...
```

```
2015-11-18   Unfamiliar with this breed. Ears pointy af. Wo...
2015-11-18   This is Jockson. He is a Pinnacle Sagittarius...
...                                                    ...
2017-07-05   This is Stanley. He has his first swim lesson ...
2017-07-06   This is Gus. He's quite the cheeky pupper. Alr...
2017-07-06   This is Rusty. He wasn't ready for the first p...
2017-07-07   Please only send dogs. We don't rate mechanics...
2017-07-08   This is Bella. She hopes her smile made you sm...
2017-07-10   I present to you, Pup in Hat. Pup in Hat is gr...
2017-07-11   This is Kevin. He's just so happy. 13/10 what ...
2017-07-12   Here we have a corgi undercover as a malamute...
2017-07-13   This is Maisey. She fell asleep mid-excavation...
2017-07-14   Viewer discretion advised. This is Jimbo. He w...
2017-07-15   This is Roscoe. Another pupper fallen victim t...
2017-07-16   This is Derek. He's late for a dog meeting. 13...
2017-07-16   This is Mingus. He's a wonderful father to his...
2017-07-17   This is Maya. She's very shy. Rarely leaves he...
2017-07-18   This... is a Jubilant Antarctic House Bear. We...
2017-07-18   You may not have known you needed to see this ...
2017-07-19   I've yet to rate a Venezuelan Hover Wiener. Th...
2017-07-19   This is Jeffrey. He has a monopoly on the pool...
2017-07-20   This is Gerald. He was just told he didn't get...
2017-07-22   This is Ralphus. He's powering up. Attempting ...
2017-07-23   This is Jim. He found a fren. Taught him how t...
2017-07-24   This is Oliver. You're witnessing one of his m...
2017-07-25   This is Ted. He does his best. Sometimes that'...
2017-07-26   This is Koda. He is a South Australian decksha...
2017-07-27   This is Zoey. She doesn't want to be one of th...
2017-07-28   When you watch your owner call another dog a g...
2017-07-29   Here we have a majestic great white breaching ...
2017-07-29   This is Franklin. He would like you to stop ca...
2017-07-30   This is Darla. She commenced a snooze mid meal...
2017-07-31   This is Archie. He is a rare Norwegian Pouncin...

                                            jpg_url  img_num  \
date
2015-11-15      https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5PY90WoAAQGLo.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5cN_3WEAAlOoZ.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT5d9DZXAAALcwe.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT51-JJUEAA6hV8.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT54YGiWUAEZnoK.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT56LSZWoAAlJj2.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT8QCd1WEAADXws.jpg         1
2015-11-16      https://pbs.twimg.com/media/CT8T1mtUwAA3aqm.jpg         1
```

```
2015-11-16      https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT8mx7KW4AEQu8N.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT9cx0tUEAAhNN_.jpg        1
2015-11-16      https://pbs.twimg.com/media/CT-D2ZHWIAA3gK1.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-NvwmW4AAugGZ.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-YWb7U8AA7QnN.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-aggCXAAIMfT3.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-g-0DUwAEQdSn.jpg        1
2015-11-17      https://pbs.twimg.com/media/CT-nsTQWEAEkyDn.jpg        1
2015-11-17      https://pbs.twimg.com/media/CUBl6IwVAAA9_zT.jpg        1
2015-11-17      https://pbs.twimg.com/media/CUCQTpEWEAA7EDz.jpg        1
2015-11-17      https://pbs.twimg.com/media/CUCZLHlUAAAeAig.jpg        1
2015-11-18      https://pbs.twimg.com/media/CUDeDoWUYAAD-EM.jpg        1
2015-11-18      https://pbs.twimg.com/media/CUDigRXXIAATI_H.jpg        1
2015-11-18      https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg        1
2015-11-18      https://pbs.twimg.com/media/CUD3A7YWoAA82N0.jpg        1
...                                                             ...   ...
2017-07-05      https://pbs.twimg.com/media/DD-40X3WAAAJPU5.jpg        1
2017-07-06      https://pbs.twimg.com/media/DEAz_HHXsAA-p_z.jpg        1
2017-07-06      https://pbs.twimg.com/media/DEEEnIqXYAAiJh_.jpg        1
2017-07-07      https://pbs.twimg.com/media/DEF2-_hXoAAs62q.jpg        2
2017-07-08      https://pbs.twimg.com/media/DELC9dZXUAADqUk.jpg        1
2017-07-10      https://pbs.twimg.com/media/DEYrIZwWsAA2Wo5.jpg        1
2017-07-11      https://pbs.twimg.com/media/DEaZQkfXUAEC7qB.jpg        1
2017-07-12      https://pbs.twimg.com/media/DEi_N9qXYAAgEEw.jpg        4
2017-07-13      https://pbs.twimg.com/media/DEoH3yvXgAAzQtS.jpg        1
2017-07-14      https://pbs.twimg.com/media/DEumeWWVOAA-Z61.jpg        1
2017-07-15      https://pbs.twimg.com/media/DEOBTnQUwAApKEH.jpg        1
2017-07-16      https://pbs.twimg.com/media/DE4fEDzWAAAyHMM.jpg        1
2017-07-16      https://pbs.twimg.com/media/DE5Se8FXcAAJFx4.jpg        1
2017-07-17      https://pbs.twimg.com/media/DE8yicJWOAAAvBJ.jpg        2
2017-07-18      https://pbs.twimg.com/media/DE-eAq6UwAA-jaE.jpg        1
2017-07-18      https://pbs.twimg.com/ext_tw_video_thumb/88734...      1
2017-07-19      https://pbs.twimg.com/ext_tw_video_thumb/88751...      1
2017-07-19      https://pbs.twimg.com/media/DFHDQBbXgAEqY7t.jpg        1
2017-07-20      https://pbs.twimg.com/media/DFMWn56WsAAkA7B.jpg        1
2017-07-22      https://pbs.twimg.com/media/DFTH_O-UQAACu20.jpg        3
2017-07-23      https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg        1
2017-07-24      https://pbs.twimg.com/ext_tw_video_thumb/88927...      1
2017-07-25      https://pbs.twimg.com/media/DFihzFfXsAYGDPR.jpg        1
2017-07-26      https://pbs.twimg.com/media/DFnwSY4WAAAMliS.jpg        1
2017-07-27      https://pbs.twimg.com/media/DFwUU__XcAEpyXI.jpg        1
2017-07-28      https://pbs.twimg.com/media/DFyBahAVwAAhUTd.jpg        2
2017-07-29      https://pbs.twimg.com/media/DF3HwyEWsAABqE6.jpg        1
2017-07-29      https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg        2
2017-07-30      https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg        1
```

```
2017-07-31     https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg          1

                                          p1    p1_conf  p1_dog  \
date
2015-11-15                      redbone   0.506826   True
2015-11-16          Rhodesian ridgeback   0.408143   True
2015-11-16                    box turtle 0.933012   False
2015-11-16                 shopping cart 0.962465   False
2015-11-16              miniature poodle 0.201493   True
2015-11-16                 Gordon setter 0.503672   True
2015-11-16                  Walker hound 0.260857   True
2015-11-16                         Lhasa 0.582330   True
2015-11-16                English setter 0.298617   True
2015-11-16                           hen 0.965932   False
2015-11-16              desktop computer 0.086502   False
2015-11-16             Italian greyhound 0.176053   True
2015-11-16                   Maltese dog 0.857531   True
2015-11-16               three-toed sloth 0.914671  False
2015-11-16                            ox 0.416669   False
2015-11-16              golden retriever 0.858744   True
2015-11-16                      malamute 0.336874   True
2015-11-16                     Chihuahua 0.978108   True
2015-11-17       black-and-tan coonhound 0.529139   True
2015-11-17                   toy terrier 0.149680   True
2015-11-17              Blenheim spaniel 0.906777   True
2015-11-17                      Pembroke 0.371361   True
2015-11-17       Chesapeake Bay retriever 0.184130  True
2015-11-17                   Ibizan hound 0.044333  True
2015-11-17               German shepherd 0.975401   True
2015-11-17             Labrador retriever 0.887707  True
2015-11-18                      seat belt 0.375057  False
2015-11-18             Italian greyhound 0.618316   True
2015-11-18                         snail 0.999888   False
2015-11-18                English setter 0.328792   True
...                                 ...        ...    ...
2017-07-05                      Pembroke 0.542982   True
2017-07-06             Labrador retriever 0.850050  True
2017-07-06                     Eskimo dog 0.466778  True
2017-07-07              golden retriever 0.949562   True
2017-07-08              golden retriever 0.943082   True
2017-07-10                      Pembroke 0.993225   True
2017-07-11                           pug 0.546406   True
2017-07-12                      malamute 0.812482   True
2017-07-13                           pug 0.369275   True
2017-07-14              Blenheim spaniel 0.972494   True
2017-07-15                French bulldog 0.999201   True
2017-07-16                   convertible 0.738995   False
2017-07-16                        kuvasz 0.309706   True
```

date				
2017-07-17	Chihuahua	0.793469	True
2017-07-18	Samoyed	0.733942	True
2017-07-18	Mexican hairless	0.330741	True
2017-07-19	limousine	0.130432	False
2017-07-19	basset	0.821664	True
2017-07-20	French bulldog	0.995026	True
2017-07-22	Siberian husky	0.700377	True
2017-07-23	golden retriever	0.714719	True
2017-07-24	whippet	0.626152	True
2017-07-25	French bulldog	0.991650	True
2017-07-26	Samoyed	0.957979	True
2017-07-27	Irish terrier	0.487574	True
2017-07-28	Pomeranian	0.566142	True
2017-07-29	Chesapeake Bay retriever	0.425595	True
2017-07-29	basset	0.555712	True
2017-07-30	paper towel	0.170278	False
2017-07-31	Chihuahua	0.716012	True

	p2	...	p3 \
date		...	
2015-11-15	miniature pinscher	...	Rhodesian ridgeback
2015-11-16	redbone	...	miniature pinscher
2015-11-16	mud turtle	...	terrapin
2015-11-16	shopping basket	...	golden retriever
2015-11-16	komondor	...	soft-coated wheaten terrier
2015-11-16	Yorkshire terrier	...	Pekinese
2015-11-16	English foxhound	...	Ibizan hound
2015-11-16	Shih-Tzu	...	Dandie Dinmont
2015-11-16	Newfoundland	...	borzoi
2015-11-16	cock	...	partridge
2015-11-16	desk	...	bookcase
2015-11-16	toy terrier	...	basenji
2015-11-16	toy poodle	...	miniature poodle
2015-11-16	otter	...	great grey owl
2015-11-16	Newfoundland	...	groenendael
2015-11-16	Chesapeake Bay retriever	...	Labrador retriever
2015-11-16	Siberian husky	...	Eskimo dog
2015-11-16	toy terrier	...	papillon
2015-11-17	bloodhound	...	flat-coated retriever
2015-11-17	papillon	...	Chihuahua
2015-11-17	cocker spaniel	...	Shih-Tzu
2015-11-17	chow	...	Pomeranian
2015-11-17	chain saw	...	power drill
2015-11-17	Pembroke	...	West Highland white terrier
2015-11-17	beagle	...	bloodhound
2015-11-17	Chihuahua	...	French bulldog
2015-11-18	miniature pinscher	...	Chihuahua
2015-11-18	Weimaraner	...	vizsla

```
2015-11-18                    slug  ...                    acorn
2015-11-18        Brittany spaniel  ...            Ibizan hound
...                             ...  ...                      ...
2017-07-05               Chihuahua  ...                 Cardigan
2017-07-06  Chesapeake Bay retriever  ...    flat-coated retriever
2017-07-06            Siberian husky  ...                    dingo
2017-07-07        Labrador retriever  ...                   kuvasz
2017-07-08        Labrador retriever  ...                   kuvasz
2017-07-10                 Cardigan  ...                Chihuahua
2017-07-11            French bulldog  ...        Brabancon griffon
2017-07-12            Siberian husky  ...               Eskimo dog
2017-07-13        Labrador retriever  ...                   kuvasz
2017-07-14                  Shih-Tzu  ...    Bernese mountain dog
2017-07-15                 Chihuahua  ...               Boston bull
2017-07-16                sports car  ...                car wheel
2017-07-16             Great Pyrenees  ...           Dandie Dinmont
2017-07-17               toy terrier  ...               can opener
2017-07-18                Eskimo dog  ...  Staffordshire bullterrier
2017-07-18                  sea lion  ...                Weimaraner
2017-07-19                  tow truck  ...             shopping cart
2017-07-19                   redbone  ...                Weimaraner
2017-07-20                       pug  ...               bull mastiff
2017-07-22                Eskimo dog  ...                  malamute
2017-07-23           Tibetan mastiff  ...        Labrador retriever
2017-07-24                    borzoi  ...                    Saluki
2017-07-25                     boxer  ...  Staffordshire bullterrier
2017-07-26                Pomeranian  ...                      chow
2017-07-27               Irish setter  ...    Chesapeake Bay retriever
2017-07-28                Eskimo dog  ...                  Pembroke
2017-07-29             Irish terrier  ...           Indian elephant
2017-07-29           English springer  ...  German short-haired pointer
2017-07-30        Labrador retriever  ...                  spatula
2017-07-31                  malamute  ...                    kelpie

              p3_conf p3_dog  rating_numerator  rating_denominator  \
date
2015-11-15  0.072010   True               7.0                10.0
2015-11-16  0.222752   True               6.0                10.0
2015-11-16  0.017885  False               2.0                10.0
2015-11-16  0.007959   True               9.0                10.0
2015-11-16  0.082086   True               8.0                10.0
2015-11-16  0.109454   True               9.0                10.0
2015-11-16  0.097471   True              10.0                10.0
2015-11-16  0.089688   True               8.0                10.0
2015-11-16  0.133649   True              11.0                10.0
2015-11-16  0.000052  False               1.0                10.0
2015-11-16  0.079480  False              10.0                10.0
2015-11-16  0.111152   True              11.0                10.0
```

```
2015-11-16  0.025581  True     1.0      2.0
2015-11-16  0.013207  False    3.0     10.0
2015-11-16  0.102643  True     9.0     10.0
2015-11-16  0.014241  True    10.0     10.0
2015-11-16  0.093412  True     8.0     10.0
2015-11-16  0.004577  True     9.0     10.0
2015-11-17  0.173810  True     7.0     10.0
2015-11-17  0.142860  True    10.0     10.0
2015-11-17  0.001117  True    12.0     10.0
2015-11-17  0.241878  True     7.0     10.0
2015-11-17  0.036763  False   10.0     10.0
2015-11-17  0.038906  True     9.0     10.0
2015-11-17  0.005394  True     8.0     10.0
2015-11-17  0.020756  True     8.0     10.0
2015-11-18  0.086951  True     5.0     10.0
2015-11-18  0.085989  True    10.0     10.0
2015-11-18  0.000026  False    2.0     10.0
2015-11-18  0.057461  True     8.0     10.0
...              ...  ...      ...      ...
2017-07-05  0.107699  True    13.0     10.0
2017-07-06  0.015579  True    12.0     10.0
2017-07-06  0.073414  False   13.0     10.0
2017-07-07  0.002471  True    13.0     10.0
2017-07-08  0.005501  True     5.0     10.0
2017-07-10  0.002081  True    14.0     10.0
2017-07-11  0.044002  True    13.0     10.0
2017-07-12  0.055770  True    13.0     10.0
2017-07-13  0.134697  True    13.0     10.0
2017-07-14  0.006239  True    12.0     10.0
2017-07-15  0.000076  True    12.0     10.0
2017-07-16  0.044173  False   13.0     10.0
2017-07-16  0.086346  True    13.0     10.0
2017-07-17  0.032253  False   13.0     10.0
2017-07-18  0.029705  True    12.0     10.0
2017-07-18  0.134203  True    13.0     10.0
2017-07-19  0.026321  False   14.0     10.0
2017-07-19  0.026236  True    13.0     10.0
2017-07-20  0.000903  True    12.0     10.0
2017-07-22  0.111411  True    13.0     10.0
2017-07-23  0.105506  True    12.0     10.0
2017-07-24  0.027351  True    13.0     10.0
2017-07-25  0.001498  True    12.0     10.0
2017-07-26  0.008167  True    13.0     10.0
2017-07-27  0.118184  True    13.0     10.0
2017-07-28  0.076507  True    13.0     10.0
2017-07-29  0.076902  False   13.0     10.0
2017-07-29  0.175219  True    12.0     10.0
2017-07-30  0.040836  False   13.0     10.0
```

2017-07-31	0.031379	True	12.0	10.0

date	time	name	stage	rating	dog_type
2015-11-15	2018-09-15 23:05:00	None	None	0.7	None
2015-11-16	2018-09-15 00:04:00	None	None	0.6	None
2015-11-16	2018-09-15 00:35:00	None	None	0.2	None
2015-11-16	2018-09-15 00:55:00	None	None	0.9	None
2015-11-16	2018-09-15 01:01:00	None	None	0.8	None
2015-11-16	2018-09-15 01:52:00	None	None	0.9	None
2015-11-16	2018-09-15 01:59:00	None	None	1.0	None
2015-11-16	2018-09-15 03:44:00	None	None	0.8	None
2015-11-16	2018-09-15 03:55:00	None	None	1.1	None
2015-11-16	2018-09-15 04:02:00	None	None	0.1	None
2015-11-16	2018-09-15 14:57:00	None	None	1.0	None
2015-11-16	2018-09-15 15:14:00	None	None	1.1	None
2015-11-16	2018-09-15 16:11:00	None	None	0.5	None
2015-11-16	2018-09-15 16:37:00	None	None	0.3	None
2015-11-16	2018-09-15 19:31:00	None	None	0.9	None
2015-11-16	2018-09-15 20:01:00	None	None	1.0	None
2015-11-16	2018-09-15 20:32:00	None	None	0.8	None
2015-11-16	2018-09-15 23:23:00	None	None	0.9	None
2015-11-17	2018-09-15 00:06:00	None	None	0.7	None
2015-11-17	2018-09-15 00:53:00	Walter	None	1.0	None
2015-11-17	2018-09-15 01:02:00	None	None	1.2	None
2015-11-17	2018-09-15 01:30:00	None	None	0.7	None
2015-11-17	2018-09-15 02:00:00	None	None	1.0	None
2015-11-17	2018-09-15 15:51:00	Jimothy	None	0.9	None
2015-11-17	2018-09-15 18:56:00	Christoper	None	0.8	None
2015-11-17	2018-09-15 19:35:00	None	None	0.8	None
2015-11-18	2018-09-15 00:36:00	Josep	None	0.5	None
2015-11-18	2018-09-15 00:55:00	None	None	1.0	None
2015-11-18	2018-09-15 01:12:00	None	None	0.2	None
2015-11-18	2018-09-15 02:25:00	Jockson	None	0.8	None
...	...	...	...	...	...
2017-07-05	2018-09-15 15:48:00	Stanley	None	1.3	None
2017-07-06	2018-09-15 00:46:00	Gus	pupper	1.2	pupper
2017-07-06	2018-09-15 15:58:00	Rusty	None	1.3	None
2017-07-07	2018-09-15 00:17:00	None	None	1.3	None
2017-07-08	2018-09-15 00:28:00	Bella	None	0.5	None
2017-07-10	2018-09-15 15:58:00	None	None	1.4	None
2017-07-11	2018-09-15 00:00:00	Kevin	None	1.3	None
2017-07-12	2018-09-15 16:03:00	None	None	1.3	None
2017-07-13	2018-09-15 15:58:00	Maisey	None	1.3	None
2017-07-14	2018-09-15 22:10:00	Jimbo	None	1.2	None
2017-07-15	2018-09-15 23:25:00	Roscoe	pupper	1.2	pupper
2017-07-16	2018-09-15 20:14:00	Derek	None	1.3	None
2017-07-16	2018-09-15 23:58:00	Mingus	None	1.3	None

```
2017-07-17  2018-09-15 16:17:00      Maya   None   1.3    None
2017-07-18  2018-09-15 00:07:00      None   None   1.2    None
2017-07-18  2018-09-15 16:08:00      None   None   1.3    None
2017-07-19  2018-09-15 03:39:00      None   None   1.4    None
2017-07-19  2018-09-15 16:06:00   Jeffrey   None   1.3    None
2017-07-20  2018-09-15 16:49:00    Gerald   None   1.2    None
2017-07-22  2018-09-15 00:23:00   Ralphus   None   1.3    None
2017-07-23  2018-09-15 00:22:00       Jim   None   1.2    None
2017-07-24  2018-09-15 00:19:00    Oliver   None   1.3    None
2017-07-25  2018-09-15 00:10:00       Ted   None   1.2    None
2017-07-26  2018-09-15 00:31:00      Koda   None   1.3    None
2017-07-27  2018-09-15 16:25:00      Zoey   None   1.3    None
2017-07-28  2018-09-15 00:22:00      None   None   1.3    None
2017-07-29  2018-09-15 00:08:00      None   None   1.3    None
2017-07-29  2018-09-15 16:00:00  Franklin   None   1.2    None
2017-07-30  2018-09-15 15:58:00     Darla   None   1.3    None
2017-07-31  2018-09-15 00:18:00    Archie   None   1.2    None

[1253 rows x 22 columns]
```

```
In [104]: twitter_archive_master['dog_type'].value_counts()

Out[104]: None      1032
          pupper     156
          doggo       34
          puppo       16
          floof       15
          Name: dog_type, dtype: int64
```

62   assigned 0.0 to ratings for none dog type .

```
In [105]: twitter_archive_master.loc[twitter_archive_master['dog_type'] == 'None', 'dog_type'] =
          twitter_archive_master.loc[twitter_archive_master['rating'] == 0.0, 'rating'] = np.nan

In [107]: twitter_archive_master.boxplot(column='rating', by='dog_type',figsize=(16,16));

/opt/conda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:57: FutureWarning: reshape is d
  return getattr(obj, method)(*args, **kwds)
```

rating
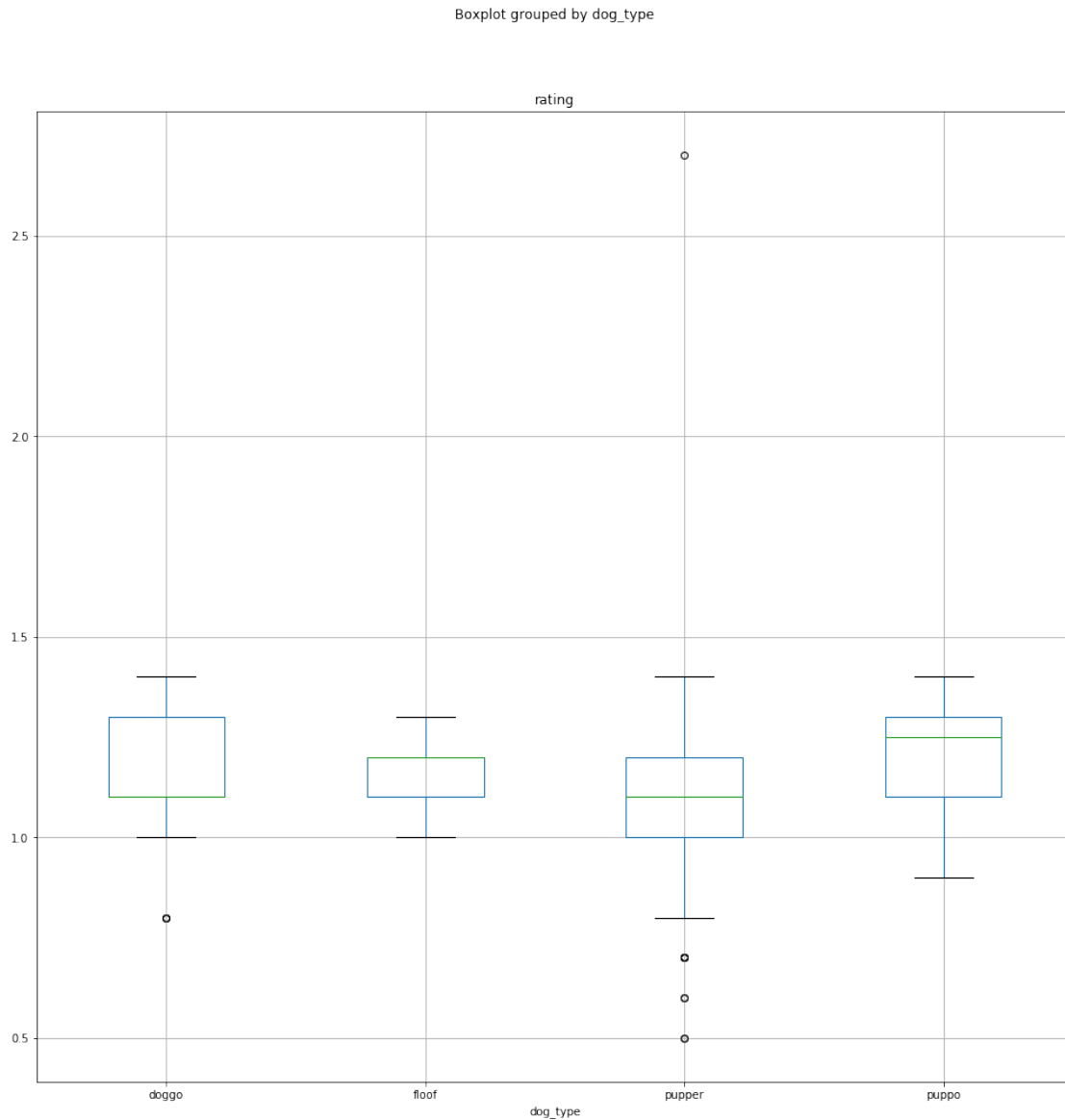
63 Insights # 3

64 Define most common used dog names

65 code below

```
In [108]: # count the most common dogs .
          from collections import Counter

          y = twitter_archive_master['name']
```

```
            count = Counter(y)

            #Test
            count.most_common(10)

Out[108]: [('None', 418),
           ('Oliver', 8),
           ('Winston', 7),
           ('Tucker', 6),
           ('Lucy', 6),
           ('Cooper', 6),
           ('Penny', 5),
           ('Bella', 5),
           ('Toby', 5),
           ('Sadie', 5)]
```

In [109]: *# Oliver =8 times used , winston =7 , tucker =6 , lucy=6 ,cooper =6 .*

66 insights # 4 & visual # 2

67 define - find the most common dog in the dataset, this cleanup should be done before analyzing . realize after starting analyzing the dataset .

```
In [111]: ###using  - prediction columns(p1, p2 or p3) along with confidence columns to come up
          # creating 2 columns . first storing data in lists .
          dog_breed_type = []
          confidence_list = []


          def image(twitter_archive_master):
              if twitter_archive_master['p1_dog'] == True:
                  dog_breed_type.append(twitter_archive_master['p1'])
                  confidence_list.append(twitter_archive_master['p1_conf'])
              elif twitter_archive_master['p2_dog'] == True:
                  dog_breed_type.append(twitter_archive_master['p2'])
                  confidence_list.append(twitter_archive_master['p2_conf'])
              elif twitter_archive_master['p3_dog'] == True:
                  dog_breed_type.append(twitter_archive_master['p3'])
                  confidence_list.append(twitter_archive_master['p3_conf'])
              else:
                  dog_breed_type.append('Error')
                  confidence_list.append('Error')


          twitter_archive_master.apply(image, axis=1)
```

```
          twitter_archive_master['dog_breed_type'] = dog_breed_type
          twitter_archive_master['confidence_list'] = confidence_list
```

In [112]: `twitter_archive_master['dog_breed_type'].value_counts()`

Out[112]:
```
Error                       196
golden retriever             98
Pembroke                     71
Labrador retriever           64
Chihuahua                    52
pug                          42
Pomeranian                   28
toy poodle                   25
chow                         24
Chesapeake Bay retriever     22
French bulldog               22
cocker spaniel               21
malamute                     21
Samoyed                      20
Eskimo dog                   16
Shih-Tzu                     15
miniature pinscher           14
Rottweiler                   13
beagle                       13
Cardigan                     13
Old English sheepdog         12
Shetland sheepdog            12
German shepherd              12
Siberian husky               11
Staffordshire bullterrier    11
Boston bull                  10
kuvasz                       10
basset                       10
Great Dane                   10
Pekinese                     10
                           ...
Scottish deerhound            3
Doberman                      3
bull mastiff                  3
Irish terrier                 3
Tibetan terrier               3
Tibetan mastiff               3
briard                        3
wire-haired fox terrier       2
komondor                      2
Sussex spaniel                2
```

```
Australian terrier          2
Leonberg                    2
Greater Swiss Mountain dog  2
Saluki                      2
cairn                       2
Weimaraner                  2
Irish setter                2
Irish water spaniel         2
Brabancon griffon           2
Welsh springer spaniel      1
bluetick                    1
Japanese spaniel            1
standard schnauzer          1
toy terrier                 1
Irish wolfhound             1
groenendael                 1
silky terrier               1
clumber                     1
Afghan hound                1
black-and-tan coonhound     1
Name: dog_breed_type, Length: 109, dtype: int64
```

In [113]: twitter_archive_master = twitter_archive_master[twitter_archive_master['dog_breed_type

In [114]: df_dog_type_breed = twitter_archive_master.groupby('dog_breed_type').filter(lambda x:

         df_dog_type_breed['dog_breed_type'].value_counts().plot(kind = 'bar')
         plt.title('Most rated Dog breed Type')
         plt.xlabel('Count')
         plt.ylabel('dog breed ')
         fig = plt.gcf()

Most rated Dog breed Type
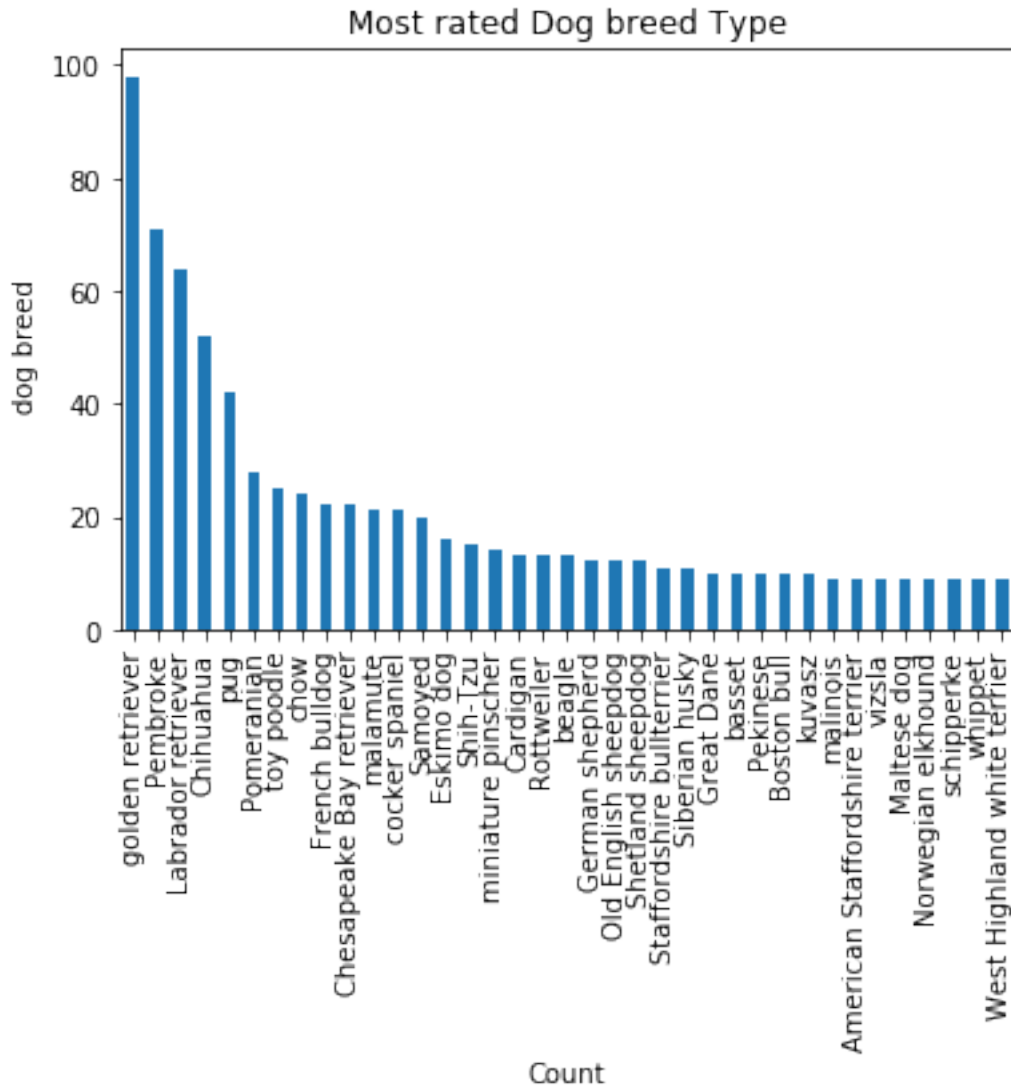

```
In [115]: dog_breed_type_mean = twitter_archive_master.groupby('dog_breed_type').mean()

In [116]: dog_breed_type_sorted = dog_breed_type_mean['rating_numerator'].sort_values()

          dog_breed_type_sorted

Out[116]: dog_breed_type
          Afghan hound                 3.000000
          Japanese spaniel             5.000000
          black-and-tan coonhound      7.000000
          soft-coated wheaten terrier  7.600000
          bluetick                     8.000000
          Maltese dog                  8.111111
          Walker hound                 9.000000
```

```
Airedale                    9.125000
English setter              9.200000
Saint Bernard               9.250000
Tibetan terrier             9.333333
Rhodesian ridgeback         9.333333
Dandie Dinmont              9.333333
dalmatian                   9.428571
Lakeland terrier            9.500000
miniature schnauzer         9.600000
redbone                     9.666667
Newfoundland                9.666667
Scottish deerhound          9.666667
English springer            9.666667
beagle                      9.692308
Boston bull                 9.700000
Great Dane                  9.700000
Bedlington terrier          9.750000
Mexican hairless            9.750000
Italian greyhound           9.750000
miniature poodle            9.857143
Ibizan hound               10.000000
papillon                   10.000000
groenendael                10.000000
                             ...
French bulldog             11.136364
Border collie              11.142857
Blenheim spaniel           11.166667
Yorkshire terrier          11.200000
Pekinese                   11.200000
Pembroke                   11.267606
wire-haired fox terrier    11.500000
cairn                      11.500000
Irish setter               11.500000
Bernese mountain dog       11.500000
giant schnauzer            11.500000
Australian terrier         11.500000
Samoyed                    11.500000
Norfolk terrier            11.666667
Gordon setter              11.750000
Tibetan mastiff            12.000000
Siberian husky             12.000000
silky terrier              12.000000
Border terrier             12.000000
standard schnauzer         12.000000
Irish water spaniel        12.000000
briard                     12.333333
golden retriever           12.918367
Saluki                     13.000000
```

```
            Pomeranian                          13.035714
            borzoi                              15.142857
            Labrador retriever                  15.296875
            chow                                16.708333
            Great Pyrenees                      18.428571
            clumber                             27.000000
            Name: rating_numerator, Length: 108, dtype: float64
```

68   Afghan hound and Japanese_spaniel has the lowest rating while Clumber & great pyreness have the highest average ratings

In [117]: print(twitter_archive_master.loc[twitter_archive_master.dog_breed_type == 'Japanese sp

```
date
2015-12-17    https://pbs.twimg.com/media/CWZBsjPWsAAZFFl.jpg
Name: jpg_url, dtype: object
```

In [118]: twitter_archive_master.groupby('dog_breed_type')['rating_numerator'].describe()

Out[118]:

dog_breed_type	count	mean	std	min	25% \
Afghan hound	1.0	3.000000	NaN	3.0	3.00
Airedale	8.0	9.125000	2.416461	6.0	6.75
American Staffordshire terrier	9.0	10.666667	1.414214	8.0	10.00
Australian terrier	2.0	11.500000	2.121320	10.0	10.75
Bedlington terrier	4.0	9.750000	3.304038	6.0	7.50
Bernese mountain dog	8.0	11.500000	1.069045	10.0	10.75
Blenheim spaniel	6.0	11.166667	1.329160	9.0	10.50
Border collie	7.0	11.142857	1.214986	9.0	10.50
Border terrier	5.0	12.000000	0.707107	11.0	12.00
Boston bull	10.0	9.700000	1.702939	6.0	9.25
Brabancon griffon	2.0	10.000000	0.000000	10.0	10.00
Brittany spaniel	6.0	10.500000	1.870829	7.0	10.25
Cardigan	13.0	10.923077	1.891276	7.0	10.00
Chesapeake Bay retriever	22.0	10.681818	1.554911	8.0	10.00
Chihuahua	52.0	10.384615	2.170695	3.0	9.75
Dandie Dinmont	6.0	9.333333	3.502380	3.0	8.50
Doberman	3.0	10.666667	0.577350	10.0	10.50
English setter	5.0	9.200000	1.303840	8.0	8.00
English springer	6.0	9.666667	2.422120	5.0	10.00
Eskimo dog	16.0	11.125000	1.500000	9.0	10.00
French bulldog	22.0	11.136364	1.726418	8.0	10.00
German shepherd	12.0	10.750000	1.544786	8.0	10.00
German short-haired pointer	4.0	10.500000	1.000000	10.0	10.00
Gordon setter	4.0	11.750000	2.217356	9.0	10.50
Great Dane	10.0	9.700000	2.626785	4.0	8.50
Great Pyrenees	7.0	18.428571	18.392545	9.0	11.00

Greater Swiss Mountain dog	2.0	10.500000	2.121320	9.0	9.75
Ibizan hound	4.0	10.000000	2.160247	8.0	8.75
Irish setter	2.0	11.500000	0.707107	11.0	11.25
Irish terrier	3.0	11.000000	1.732051	10.0	10.00
...	...	...	...	...	...
clumber	1.0	27.000000	NaN	27.0	27.00
cocker spaniel	21.0	11.000000	1.140175	9.0	10.00
collie	7.0	11.000000	1.414214	9.0	10.00
dalmatian	7.0	9.428571	2.760262	5.0	8.00
flat-coated retriever	8.0	10.875000	2.531939	5.0	10.75
giant schnauzer	4.0	11.500000	1.732051	10.0	10.00
golden retriever	98.0	12.918367	13.413083	5.0	11.00
groenendael	1.0	10.000000	NaN	10.0	10.00
keeshond	4.0	10.250000	1.500000	9.0	9.00
kelpie	8.0	11.125000	0.991031	10.0	10.75
komondor	2.0	10.500000	0.707107	10.0	10.25
kuvasz	10.0	10.600000	2.674987	4.0	11.00
malamute	21.0	10.666667	1.354006	8.0	10.00
malinois	9.0	10.444444	2.006932	6.0	10.00
miniature pinscher	14.0	10.357143	1.905746	5.0	10.00
miniature poodle	7.0	9.857143	1.676163	8.0	8.50
miniature schnauzer	5.0	9.600000	2.792848	5.0	9.00
papillon	5.0	10.000000	1.870829	8.0	8.00
pug	42.0	10.333333	1.856651	3.0	10.00
redbone	6.0	9.666667	2.250926	7.0	7.75
schipperke	9.0	10.888889	1.452966	8.0	10.00
silky terrier	1.0	12.000000	NaN	12.0	12.00
soft-coated wheaten terrier	5.0	7.600000	3.781534	3.0	4.00
standard poodle	5.0	10.400000	1.140175	9.0	10.00
standard schnauzer	1.0	12.000000	NaN	12.0	12.00
toy poodle	25.0	11.080000	0.996661	9.0	11.00
toy terrier	1.0	10.000000	NaN	10.0	10.00
vizsla	9.0	10.777778	1.201850	8.0	11.00
whippet	9.0	10.000000	1.936492	8.0	8.00
wire-haired fox terrier	2.0	11.500000	0.707107	11.0	11.25

	50%	75%	max
dog_breed_type			
Afghan hound	3.0	3.00	3.0
Airedale	10.0	11.00	12.0
American Staffordshire terrier	11.0	11.00	13.0
Australian terrier	11.5	12.25	13.0
Bedlington terrier	10.0	12.25	13.0
Bernese mountain dog	12.0	12.00	13.0
Blenheim spaniel	12.0	12.00	12.0
Border collie	12.0	12.00	12.0
Border terrier	12.0	12.00	13.0
Boston bull	10.0	10.75	12.0

```
Brabancon griffon                10.0   10.00    10.0
Brittany spaniel                 11.0   11.75    12.0
Cardigan                         11.0   13.00    13.0
Chesapeake Bay retriever         10.0   12.00    13.0
Chihuahua                        10.5   12.00    14.0
Dandie Dinmont                   10.5   11.00    13.0
Doberman                         11.0   11.00    11.0
English setter                    9.0   10.00    11.0
English springer                 10.0   10.75    12.0
Eskimo dog                       11.0   12.00    14.0
French bulldog                   12.0   12.00    14.0
German shepherd                  10.5   12.00    13.0
German short-haired pointer      10.0   10.50    12.0
Gordon setter                    12.0   13.25    14.0
Great Dane                       10.5   11.75    12.0
Great Pyrenees                   12.0   13.00    60.0
Greater Swiss Mountain dog       10.5   11.25    12.0
Ibizan hound                      9.5   10.75    13.0
Irish setter                     11.5   11.75    12.0
Irish terrier                    10.0   11.50    13.0
...                               ...    ...      ...
clumber                          27.0   27.00    27.0
cocker spaniel                   11.0   12.00    13.0
collie                           11.0   12.00    13.0
dalmatian                         9.0   11.50    13.0
flat-coated retriever            12.0   12.00    13.0
giant schnauzer                  11.5   13.00    13.0
golden retriever                 12.0   12.75   143.0
groenendael                      10.0   10.00    10.0
keeshond                         10.0   11.25    12.0
kelpie                           11.0   11.25    13.0
komondor                         10.5   10.75    11.0
kuvasz                           11.5   12.00    13.0
malamute                         10.0   12.00    13.0
malinois                         10.0   12.00    13.0
miniature pinscher               10.5   12.00    12.0
miniature poodle                 10.0   11.00    12.0
miniature schnauzer              11.0   11.00    12.0
papillon                         11.0   11.00    12.0
pug                              10.0   11.00    13.0
redbone                          10.0   11.50    12.0
schipperke                       11.0   12.00    13.0
silky terrier                    12.0   12.00    12.0
soft-coated wheaten terrier      10.0   10.00    11.0
standard poodle                  10.0   11.00    12.0
standard schnauzer               12.0   12.00    12.0
toy poodle                       11.0   12.00    13.0
toy terrier                      10.0   10.00    10.0
```

```
              vizsla                              11.0  11.00   12.0
              whippet                             10.0  12.00   13.0
              wire-haired fox terrier             11.5  11.75   12.0

              [108 rows x 8 columns]

In [119]: twitter_archive_master.to_csv('twitter_archive_master.csv')

In [120]: twitter_archive_master[twitter_archive_master['rating_numerator'] <= 14]['rating_numer

Out[120]: count    1047.000000
          mean       10.710602
          std         1.831139
          min         1.000000
          25%        10.000000
          50%        11.000000
          75%        12.000000
          max        14.000000
          Name: rating_numerator, dtype: float64

In [3]: import pandas as pd
        twitter_archive_master=pd.read_csv("twitter_archive_master.csv")

In [4]: print(twitter_archive_master.loc[twitter_archive_master.dog_breed_type == 'clumber', 'jp

772     https://pbs.twimg.com/media/Cswbc2yWcAAVsCJ.jpg
Name: jpg_url, dtype: object


In [6]: print(twitter_archive_master.loc[twitter_archive_master.dog_breed_type == 'golden retrie

2       https://pbs.twimg.com/media/CT5PY9OWoAAQGLo.jpg
11      https://pbs.twimg.com/media/CT9Vn7PWoAA_ZCM.jpg
28      https://pbs.twimg.com/media/CUHREBXXAAE6A9b.jpg
37      https://pbs.twimg.com/media/CUJppKJWoAA75NP.jpg
47      https://pbs.twimg.com/media/CUOLOuGUkAAx7yh.jpg
68      https://pbs.twimg.com/media/CUY6OusWoAAdBxx.jpg
85      https://pbs.twimg.com/media/CUg9gBvWoAAmx-2.jpg
89      https://pbs.twimg.com/media/CUixld6WoAArDrJ.jpg
98      https://pbs.twimg.com/media/CUntin8WIAADmLk.jpg
109     https://pbs.twimg.com/media/CUr9NjgU8AEpf5w.jpg
172     https://pbs.twimg.com/media/CVPeX2dWwAEwyaR.jpg
183     https://pbs.twimg.com/media/CVVIjGbWwAAxkNO.jpg
195     https://pbs.twimg.com/media/CVgGc9hWIAIe1bn.jpg
199     https://pbs.twimg.com/media/CVg6L2hWIAAYuEb.jpg
201     https://pbs.twimg.com/media/CVkMRUeWsAA9bMh.jpg
207     https://pbs.twimg.com/media/CVl-ZOdWcAAs7wr.jpg
224     https://pbs.twimg.com/media/CVwHgblWcAACWOD.jpg
244     https://pbs.twimg.com/media/CV4iqh5WcAEV1E6.jpg
```

```
248      https://pbs.twimg.com/media/CV6atgoWcAEsdv6.jpg
267      https://pbs.twimg.com/media/CWEs1b-WEAEhq82.jpg
274      https://pbs.twimg.com/media/CWMqV7WUYAEEC1G.jpg
299      https://pbs.twimg.com/media/CWnznDTU4AAa-6P.jpg
313      https://pbs.twimg.com/media/CWx2FaLWcAEQ3vh.jpg
325      https://pbs.twimg.com/media/CW-loUBWYAAn2Cb.jpg
356      https://pbs.twimg.com/media/CX7br3HWsAAQ9L1.jpg
390      https://pbs.twimg.com/media/CY2iwGNWUAI5zWi.jpg
410      https://pbs.twimg.com/media/CZX8nyeVAAEstKM.jpg
411      https://pbs.twimg.com/media/CZbIIM-WkAIPC1g.jpg
467      https://pbs.twimg.com/media/CbTj--1XEAIZjc_.jpg
469      https://pbs.twimg.com/media/CbYyCMcWIAAHHjF.jpg
                              ...
835      https://pbs.twimg.com/media/CyNPmJgXcAECPuB.jpg
846      https://pbs.twimg.com/media/CzMTcZoXUAEKqEt.jpg
847      https://pbs.twimg.com/media/CzU_YVGUUAA3Xsd.jpg
855      https://pbs.twimg.com/media/C0EyPZbXAAAceSc.jpg
860      https://pbs.twimg.com/media/C0iKPZIXUAAbDYV.jpg
865      https://pbs.twimg.com/media/C0kFzOQUoAAt6yb.jpg
872      https://pbs.twimg.com/media/C04taUjWIAA6Mo4.jpg
880      https://pbs.twimg.com/media/C1cs8uAWgAEwbXc.jpg
891      https://pbs.twimg.com/media/C2d_vnHWEAE9phX.jpg
892      https://pbs.twimg.com/media/C2ftAxnWIAEUdAR.jpg
906      https://pbs.twimg.com/media/C3s_pYrXAAA1eqZ.jpg
909      https://pbs.twimg.com/media/C3_0yhCWEAETXj2.jpg
911      https://pbs.twimg.com/media/C4GzztSWAAA_qi4.jpg
925      https://pbs.twimg.com/media/C5EdT4jWEAARv2C.jpg
927      https://pbs.twimg.com/media/C5O1UAaWIAAMBMd.jpg
935      https://pbs.twimg.com/media/C6CI_jbVAAA3-a1.jpg
961      https://pbs.twimg.com/media/C9VNNp1XkAEWRFb.jpg
973      https://pbs.twimg.com/media/C-TIEwMWOAEjb55.jpg
977      https://pbs.twimg.com/media/C-icm_WXUAAmuRR.jpg
979      https://pbs.twimg.com/media/C-s5oYZXkAAMHHq.jpg
981      https://pbs.twimg.com/media/C-3wvtxXcAUTuBE.jpg
988      https://pbs.twimg.com/media/C_4-8iPVOAA1Twg.jpg
992      https://pbs.twimg.com/media/DAOmEZiXYAAcv2S.jpg
1000     https://pbs.twimg.com/media/DBQwlFCXkAACSkI.jpg
1014     https://pbs.twimg.com/media/DCn1l_dUQAAkBdG.jpg
1025     https://pbs.twimg.com/media/DDgK-J4XUAIEV9W.jpg
1028     https://pbs.twimg.com/media/DD5yKdPWOAArzX8.jpg
1032     https://pbs.twimg.com/media/DEF2-_hXoAAs62q.jpg
1033     https://pbs.twimg.com/media/DELC9dZXUAADqUk.jpg
1047     https://pbs.twimg.com/media/DFYRgsOUQAARGhO.jpg
Name: jpg_url, Length: 98, dtype: object
```