wrangle_act

September 4, 2020

Gathering Data

[894]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import tweepy
import json
import requests
import os
import re
%matplotlib inline
```

[425]:
```
# Import twitter archive into it own dataframe
twitter_archive = pd.read_csv("twitter-archive-enhanced.csv")
```

[426]:
```
# make a copy of the dataframe for data cleaning purposes
twitter_archive_clean = twitter_archive.copy()
```

[427]:
```
# Saving file url
url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/
 ↪599fd2ad_image-predictions/image-predictions.tsv'
```

[428]:
```
# downlading required file
r = requests.get(url)
open('image_predictions.tsv','wb').write(r.content)
```

[428]: 335079

[429]:
```
image_predictions = pd.read_csv('image_predictions.tsv', sep='\t')
```

[16]:
```
# Authenticating twitter API
consumer_key =
consumer_secret =
access_token =
access_secret =

auth = tweepy.OAuthHandler(consumer_key, consumer_secret)
```

```
auth.set_access_token(access_token, access_secret)


api = tweepy.API(auth)
```

[17]:
```
# Getting each tweet data using the tweet's ID and storing it in a text file
with open('tweet_json.txt', 'w') as file:
    for tweet_id in twitter_archive_clean.tweet_id:
        try:
            tweet = api.get_status(tweet_id, tweet_mode='extended')
        except tweepy.TweepError :
            continue
        else:
            json.dump(tweet._json, file)
            file.write('\n')
```

[129]:
```
# Construct a dataframe using tweets_list
tweets_data = pd.DataFrame(tweets_list, columns=['tweet_id', 'favorite_count',␣
↪'retweet_count'])
```

[133]:
```
tweets_data_clean = tweets_data.copy()
```

[135]:
```
tweets_data.to_csv('tweets_data.csv')
```

1 Assessing Data

[358]:
```
twitter_archive_clean.head()
```

[358]:
```
             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" rel="nofollow">Twitter for
iPhone</a>
```

```
1  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
4  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>

 text  \
0  This is Phineas. He's a mystical boy. Only ever appears in the hole of a
donut. 13/10 https://t.co/MgUWQ76dJU
1  This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not,
she's available for pats, snugs, boops, the whole bit. 13/10
https://t.co/0Xxu71qeIV
2  This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall
grass. You never know when one may strike. 12/10 https://t.co/wUnZnhtVJB
3  This is Darla. She commenced a snooze mid meal. 13/10 happens to the best of
us https://t.co/tD36da7qLQ
4  This is Franklin. He would like you to stop calling him "cute." He is a very
fierce shark and should be respected as such. 12/10 #BarkWeek
https://t.co/AtUZn91f7f

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

                                    expanded_urls  \
0  https://twitter.com/dog_rates/status/892420643555336193/photo/1
1  https://twitter.com/dog_rates/status/892177421306343426/photo/1
2  https://twitter.com/dog_rates/status/891815181378084864/photo/1
3  https://twitter.com/dog_rates/status/891689557279858688/photo/1
4  https://twitter.com/dog_rates/status/891327558926688256/photo/1,https://twitt
er.com/dog_rates/status/891327558926688256/photo/1

   rating_numerator  rating_denominator      name doggo floofer pupper puppo
0  13                10                   Phineas   None  None    None   None
1  13                10                   Tilly     None  None    None   None
2  12                10                   Archie    None  None    None   None
3  13                10                   Darla     None  None    None   None
4  12                10                   Franklin  None  None    None   None
```

[359]:
```
twitter_archive_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2356 non-null   int64
 1   in_reply_to_status_id       78 non-null     float64
 2   in_reply_to_user_id         78 non-null     float64
 3   timestamp                   2356 non-null   object
 4   source                      2356 non-null   object
 5   text                        2356 non-null   object
 6   retweeted_status_id         181 non-null    float64
 7   retweeted_status_user_id    181 non-null    float64
 8   retweeted_status_timestamp  181 non-null    object
 9   expanded_urls               2297 non-null   object
 10  rating_numerator            2356 non-null   int64
 11  rating_denominator          2356 non-null   int64
 12  name                        2356 non-null   object
 13  doggo                       2356 non-null   object
 14  floofer                     2356 non-null   object
 15  pupper                      2356 non-null   object
 16  puppo                       2356 non-null   object
dtypes: float64(4), int64(3), object(10)
memory usage: 313.0+ KB
```

[360]:
```
twitter_archive_clean.text[1]
```

[360]:
```
"This is Tilly. She's just checking pup on you. Hopes you're doing ok. If not,
she's available for pats, snugs, boops, the whole bit. 13/10
https://t.co/0Xxu71qeIV"
```

Quality issues

- Retweets included in database
- Replies included in database
- tweets with no images inclueded in database
- [‘retweeted_status_id’, ‘retweeted_status_user_id’ ,‘retweeted_status_timestamp’, ‘expanded_urls’] columns, not needed for analysis.
- [‘p1, p1_conf’, ‘p1_dog’, ‘p2, p2_conf’, ‘p2_dog’, ‘p3, p3_conf’, ‘p3_dog’, ‘img_num’] not needed for analysis
- [‘timestamp’] column has extra characters.
- [‘source’] column does not state the tweet’s source clearly.
- [‘name’] column has wrong values.
- [‘tweet_id’] column data type is int64 should be str.
- [‘timestamp’] columns data type is str, should be datetime.
- [‘dog_type’] should have category data type.
- [‘source’] sould have category data type.

- [‘rating_numerator’] and [‘rating_denominator’] column has some wrong values.
- [‘dog_breed’] values are in different forms

Tidiness Issues

- image_predictions, tweet_data and twitter archive should be one table
- [‘doggo’, ‘floofer’, ‘pupper’, ‘puppo’] should be a single variable

1.0.1 Cleaning

Define

Quality

- ☒ Drop replies.
- ☒ Drop retweets.
- ☒ Drop tweets with no images.
- ☒ Drop [‘retweeted_status_id’, ‘retweeted_status_user_id’ ,‘retweeted_status_timestamp’, ‘expanded_urls’] columns, not needed for analysis.
- ☒ [‘p1, p1_conf’, ‘p1_dog’, ‘p2, p2_conf’, ‘p2_dog’, ‘p3, p3_conf’, ‘p3_dog’, ‘img_num’] not needed for analysis
- ☒ Remove extra ‘+0000’ in timestamp column
- ☒ Extract tweet source from ‘source’ column
- ☒ Fix dog names.
- ☒ Change tweet_id data type to str.
- ☒ Change timestamp’ data type to datetime.
- ☒ Change ‘dog_type’ type to category
- ☒ Change ‘source’ type to category
- ☒ Fix rating_numerator column with correct rating values.
- ☒ Fix rating_denominator column with correct rating values.
- ☒ Fix dog breeds to have the same form.

Tidiness

- ☒ Merge all tables together
- ☒ Convert [‘doggo’, ‘floofer’, ‘pupper’, ‘puppo’] to a single column
- ☒ Extract dog_breed and its confidence

image_predictions_clean = image_predictions.copy()

[449]:
```
image_predictions_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2075 entries, 0 to 2074
Data columns (total 12 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   tweet_id  2075 non-null   int64
```

```
 1   jpg_url   2075 non-null   object
 2   img_num   2075 non-null   int64
 3   p1        2075 non-null   object
 4   p1_conf   2075 non-null   float64
 5   p1_dog    2075 non-null   bool
 6   p2        2075 non-null   object
 7   p2_conf   2075 non-null   float64
 8   p2_dog    2075 non-null   bool
 9   p3        2075 non-null   object
 10  p3_conf   2075 non-null   float64
 11  p3_dog    2075 non-null   bool
dtypes: bool(3), float64(3), int64(2), object(4)
memory usage: 152.1+ KB
```

[450]:
```
twitter_archive_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2356 non-null   int64
 1   in_reply_to_status_id       78 non-null     float64
 2   in_reply_to_user_id         78 non-null     float64
 3   timestamp                   2356 non-null   object
 4   source                      2356 non-null   object
 5   text                        2356 non-null   object
 6   retweeted_status_id         181 non-null    float64
 7   retweeted_status_user_id    181 non-null    float64
 8   retweeted_status_timestamp  181 non-null    object
 9   expanded_urls               2297 non-null   object
 10  rating_numerator            2356 non-null   int64
 11  rating_denominator          2356 non-null   int64
 12  name                        2356 non-null   object
 13  doggo                       2356 non-null   object
 14  floofer                     2356 non-null   object
 15  pupper                      2356 non-null   object
 16  puppo                       2356 non-null   object
dtypes: float64(4), int64(3), object(10)
memory usage: 313.0+ KB
```

[470]:
```
tweets_data_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2215 entries, 0 to 2214
Data columns (total 3 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
```

```
 0   tweet_id        2215 non-null   int64
 1   favorite_count  2215 non-null   int64
 2   retweet_count   2215 non-null   int64
dtypes: int64(3)
memory usage: 69.2 KB
```

1- Merge all tables together

[489]:
```
# merging tables together
twitter_archive_master = pd.merge(twitter_archive_clean, tweets_data_clean,␣
 ↪on=['tweet_id'], how='left')
```

[490]:
```
twitter_archive_master = pd.merge(twitter_archive_master,␣
 ↪image_predictions_clean, on=['tweet_id'], how='left')
```

[491]:
```
master_clean = twitter_archive_master.copy()
```

[492]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2356 entries, 0 to 2355
Data columns (total 30 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2356 non-null   int64
 1   in_reply_to_status_id       78 non-null     float64
 2   in_reply_to_user_id         78 non-null     float64
 3   timestamp                   2356 non-null   object
 4   source                      2356 non-null   object
 5   text                        2356 non-null   object
 6   retweeted_status_id         181 non-null    float64
 7   retweeted_status_user_id    181 non-null    float64
 8   retweeted_status_timestamp  181 non-null    object
 9   expanded_urls               2297 non-null   object
 10  rating_numerator            2356 non-null   int64
 11  rating_denominator          2356 non-null   int64
 12  name                        2356 non-null   object
 13  doggo                       2356 non-null   object
 14  floofer                     2356 non-null   object
 15  pupper                      2356 non-null   object
 16  puppo                       2356 non-null   object
 17  favorite_count              2215 non-null   float64
 18  retweet_count               2215 non-null   float64
 19  jpg_url                     2075 non-null   object
 20  img_num                     2075 non-null   float64
 21  p1                          2075 non-null   object
 22  p1_conf                     2075 non-null   float64
 23  p1_dog                      2075 non-null   object
```

```
 24  p2                          2075 non-null   object
 25  p2_conf                     2075 non-null   float64
 26  p2_dog                      2075 non-null   object
 27  p3                          2075 non-null   object
 28  p3_conf                     2075 non-null   float64
 29  p3_dog                      2075 non-null   object
dtypes: float64(10), int64(3), object(17)
memory usage: 570.6+ KB
```

[493]:
```
master_clean.to_csv("twitter_archive_master.csv")
```

2- Drop retweets and replies

[494]:
```
# drop retweets
master_clean = master_clean[master_clean.retweeted_status_id.isnull()]
```

[495]:
```
# drop replies
master_clean = master_clean[master_clean.in_reply_to_status_id.isnull()]
```

[496]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2097 entries, 0 to 2355
Data columns (total 30 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2097 non-null   int64
 1   in_reply_to_status_id       0 non-null      float64
 2   in_reply_to_user_id         0 non-null      float64
 3   timestamp                   2097 non-null   object
 4   source                      2097 non-null   object
 5   text                        2097 non-null   object
 6   retweeted_status_id         0 non-null      float64
 7   retweeted_status_user_id    0 non-null      float64
 8   retweeted_status_timestamp  0 non-null      object
 9   expanded_urls               2094 non-null   object
 10  rating_numerator            2097 non-null   int64
 11  rating_denominator          2097 non-null   int64
 12  name                        2097 non-null   object
 13  doggo                       2097 non-null   object
 14  floofer                     2097 non-null   object
 15  pupper                      2097 non-null   object
 16  puppo                       2097 non-null   object
 17  favorite_count              1982 non-null   float64
 18  retweet_count               1982 non-null   float64
 19  jpg_url                     1971 non-null   object
 20  img_num                     1971 non-null   float64
```

```
 21  p1                          1971 non-null   object
 22  p1_conf                     1971 non-null   float64
 23  p1_dog                      1971 non-null   object
 24  p2                          1971 non-null   object
 25  p2_conf                     1971 non-null   float64
 26  p2_dog                      1971 non-null   object
 27  p3                          1971 non-null   object
 28  p3_conf                     1971 non-null   float64
 29  p3_dog                      1971 non-null   object
dtypes: float64(10), int64(3), object(17)
memory usage: 507.9+ KB
```

[497]:
```
# drop retweets and replies related_column
master_clean.drop(['in_reply_to_status_id', 'in_reply_to_user_id',␣
 ↪'retweeted_status_id', 'retweeted_status_user_id',␣
 ↪'retweeted_status_timestamp'], axis=1, inplace=True)
```

[498]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2097 entries, 0 to 2355
Data columns (total 25 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            2097 non-null   int64
 1   timestamp           2097 non-null   object
 2   source              2097 non-null   object
 3   text                2097 non-null   object
 4   expanded_urls       2094 non-null   object
 5   rating_numerator    2097 non-null   int64
 6   rating_denominator  2097 non-null   int64
 7   name                2097 non-null   object
 8   doggo               2097 non-null   object
 9   floofer             2097 non-null   object
 10  pupper              2097 non-null   object
 11  puppo               2097 non-null   object
 12  favorite_count      1982 non-null   float64
 13  retweet_count       1982 non-null   float64
 14  jpg_url             1971 non-null   object
 15  img_num             1971 non-null   float64
 16  p1                  1971 non-null   object
 17  p1_conf             1971 non-null   float64
 18  p1_dog              1971 non-null   object
 19  p2                  1971 non-null   object
 20  p2_conf             1971 non-null   float64
 21  p2_dog              1971 non-null   object
 22  p3                  1971 non-null   object
 23  p3_conf             1971 non-null   float64
```

```
 24  p3_dog              1971 non-null   object
dtypes: float64(6), int64(3), object(16)
memory usage: 426.0+ KB
```

[500]:
```
pd.set_option('display.max_columns', 25)
```

[501]:
```
master_clean
```

[501]:
```
                tweet_id                  timestamp  \
0     892420643555336193  2017-08-01 16:23:56 +0000
1     892177421306343426  2017-08-01 00:17:27 +0000
2     891815181378084864  2017-07-31 00:18:03 +0000
3     891689557279858688  2017-07-30 15:58:51 +0000
4     891327558926688256  2017-07-29 16:00:24 +0000
…                    …                         …
2351  666049248165822465  2015-11-16 00:24:50 +0000
2352  666044226329800704  2015-11-16 00:04:52 +0000
2353  666033412701032449  2015-11-15 23:21:54 +0000
2354  666029285002620928  2015-11-15 23:05:30 +0000
2355  666020888022790149  2015-11-15 22:32:08 +0000

  source  \
0     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
1     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
4     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
…
…
2351  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2352  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2353  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2354  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
2355  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>

    text  \
0     This is Phineas. He's a mystical boy. Only ever appears in the hole of a
```

```
donut. 13/10 https://t.co/MgUWQ76dJU
1     This is Tilly. She's just checking pup on you. Hopes you're doing ok. If
not, she's available for pats, snugs, boops, the whole bit. 13/10
https://t.co/0Xxu71qeIV
2     This is Archie. He is a rare Norwegian Pouncing Corgo. Lives in the tall
grass. You never know when one may strike. 12/10 https://t.co/wUnZnhtVJB
3     This is Darla. She commenced a snooze mid meal. 13/10 happens to the best
of us https://t.co/tD36da7qLQ
4     This is Franklin. He would like you to stop calling him "cute." He is a
very fierce shark and should be respected as such. 12/10 #BarkWeek
https://t.co/AtUZn91f7f
…
…
2351  Here we have a 1949 1st generation vulpix. Enjoys sweat tea and Fox News.
Cannot be phased. 5/10 https://t.co/4B7cOc1EDq
2352  This is a purebred Piers Morgan. Loves to Netflix and chill. Always looks
like he forgot to unplug the iron. 6/10 https://t.co/DWnyCjf2mx
2353  Here is a very happy pup. Big fan of well-maintained decks. Just look at
that tongue. 9/10 would cuddle af https://t.co/y671yMhoiR
2354  This is a western brown Mitsubishi terrier. Upset about leaf. Actually 2
dogs here. 7/10 would walk the shit out of https://t.co/r7mOb2m0UI
2355  Here we have a Japanese Irish Setter. Lost eye in Vietnam (?). Big fan of
relaxing on stair. 8/10 would pet https://t.co/BLDqew2Ijj

                                      expanded_urls  \
0     https://twitter.com/dog_rates/status/892420643555336193/photo/1
1     https://twitter.com/dog_rates/status/892177421306343426/photo/1
2     https://twitter.com/dog_rates/status/891815181378084864/photo/1
3     https://twitter.com/dog_rates/status/891689557279858688/photo/1
4     https://twitter.com/dog_rates/status/891327558926688256/photo/1,https://tw
itter.com/dog_rates/status/891327558926688256/photo/1
…
…
2351  https://twitter.com/dog_rates/status/666049248165822465/photo/1
2352  https://twitter.com/dog_rates/status/666044226329800704/photo/1
2353  https://twitter.com/dog_rates/status/666033412701032449/photo/1
2354  https://twitter.com/dog_rates/status/666029285002620928/photo/1
2355  https://twitter.com/dog_rates/status/666020888022790149/photo/1

      rating_numerator  rating_denominator      name doggo floofer pupper  \
0     13                10                   Phineas   None  None    None
1     13                10                   Tilly     None  None    None
2     12                10                   Archie    None  None    None
3     13                10                   Darla     None  None    None
4     12                10                   Franklin  None  None    None
…   ..                ..                      …   …   …     …
2351  5                 10                   None      None  None    None
```

```
2352  6                10                  a         None  None    None
2353  9                10                  a         None  None    None
2354  7                10                  a         None  None    None
2355  8                10                  None      None  None    None

     puppo  favorite_count  retweet_count  \
0     None  35765.0         7565.0
1     None  30897.0         5605.0
2     None  23237.0         3715.0
3     None  39064.0         7751.0
4     None  37309.0         8346.0
…     …     …              …
2351  None  96.0            40.0
2352  None  266.0           129.0
2353  None  111.0           41.0
2354  None  120.0           42.0
2355  None  2383.0          458.0

                                              jpg_url  img_num  \
0     https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg  1.0
1     https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg  1.0
2     https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg  1.0
3     https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg  1.0
4     https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg  2.0
…                                                     …  …
2351  https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg  1.0
2352  https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg  1.0
2353  https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg  1.0
2354  https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg  1.0
2355  https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg  1.0

                          p1   p1_conf p1_dog                 p2   p2_conf  \
0     orange                   0.097049  False  bagel               0.085851
1     Chihuahua                0.323581  True   Pekinese            0.090647
2     Chihuahua                0.716012  True   malamute            0.078253
3     paper_towel              0.170278  False  Labrador_retriever  0.168086
4     basset                   0.555712  True   English_springer    0.225770
…      …                        …   …              …          …
2351  miniature_pinscher       0.560311  True   Rottweiler          0.243682
2352  Rhodesian_ridgeback      0.408143  True   redbone             0.360687
2353  German_shepherd          0.596461  True   malinois            0.138584
2354  redbone                  0.506826  True   miniature_pinscher  0.074192
2355  Welsh_springer_spaniel   0.465074  True   collie              0.156665

     p2_dog                          p3   p3_conf p3_dog
0     False  banana                    0.076110  False
1     True   papillon                  0.068957  True
```

```
2     True   kelpie                         0.031379  True
3     True   spatula                        0.040836  False
4     True   German_short-haired_pointer    0.175219  True
…     …                                …         …    …
2351  True   Doberman                       0.154629  True
2352  True   miniature_pinscher             0.222752  True
2353  True   bloodhound                     0.116197  True
2354  True   Rhodesian_ridgeback            0.072010  True
2355  True   Shetland_sheepdog              0.061428  True

[2097 rows x 25 columns]
```

3- Drop tweets with no images

[502]:
```
master_clean = master_clean[master_clean.jpg_url.notnull()]
```

[503]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 0 to 2355
Data columns (total 25 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   int64
 1   timestamp           1971 non-null   object
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   int64
 6   rating_denominator  1971 non-null   int64
 7   name                1971 non-null   object
 8   doggo               1971 non-null   object
 9   floofer             1971 non-null   object
 10  pupper              1971 non-null   object
 11  puppo               1971 non-null   object
 12  favorite_count      1869 non-null   float64
 13  retweet_count       1869 non-null   float64
 14  jpg_url             1971 non-null   object
 15  img_num             1971 non-null   float64
 16  p1                  1971 non-null   object
 17  p1_conf             1971 non-null   float64
 18  p1_dog              1971 non-null   object
 19  p2                  1971 non-null   object
 20  p2_conf             1971 non-null   float64
 21  p2_dog              1971 non-null   object
 22  p3                  1971 non-null   object
 23  p3_conf             1971 non-null   float64
```

```
 24  p3_dog              1971 non-null   object
dtypes: float64(6), int64(3), object(16)
memory usage: 400.4+ KB
```

4-Convert ['doggo', 'pupper', 'floofer', 'puppo'] into one column

[511]:
```
# create a list with column headers
column_headers = master_clean.columns.to_list()
dog_types = ['doggo', 'floofer', 'puppo', 'pupper']
```

[512]:
```
for dog_type in dog_types:
    column_headers.remove(dog_type)
```

[524]:
```
print(f'doggo: { master_clean.doggo.value_counts()[1]} ')
print(f'pupper: { master_clean.pupper.value_counts()[1]} ')
print(f'floofer: { master_clean.floofer.value_counts()[1]} ')
print(f'puppo: { master_clean.puppo.value_counts()[1]} ')
```

```
doggo: 73
pupper: 209
floofer: 8
puppo: 23
```

[534]:
```
master_clean_1 = master_clean.copy()
```

[535]:
```
master_clean_1 = pd.melt(master_clean_1, id_vars=column_headers,␣
↪value_vars=dog_types, value_name='dog_type')
```

[536]:
```
master_clean_1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7884 entries, 0 to 7883
Data columns (total 23 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            7884 non-null   int64
 1   timestamp           7884 non-null   object
 2   source              7884 non-null   object
 3   text                7884 non-null   object
 4   expanded_urls       7884 non-null   object
 5   rating_numerator    7884 non-null   int64
 6   rating_denominator  7884 non-null   int64
 7   name                7884 non-null   object
 8   favorite_count      7476 non-null   float64
 9   retweet_count       7476 non-null   float64
 10  jpg_url             7884 non-null   object
 11  img_num             7884 non-null   float64
 12  p1                  7884 non-null   object
```

```
 13  p1_conf             7884 non-null   float64
 14  p1_dog              7884 non-null   object
 15  p2                  7884 non-null   object
 16  p2_conf             7884 non-null   float64
 17  p2_dog              7884 non-null   object
 18  p3                  7884 non-null   object
 19  p3_conf             7884 non-null   float64
 20  p3_dog              7884 non-null   object
 21  variable            7884 non-null   object
 22  dog_type            7884 non-null   object
dtypes: float64(6), int64(3), object(14)
memory usage: 1.4+ MB
```

[537]:
```
master_clean_1.dog_type.value_counts()
```

[537]:
```
None       7571
pupper     209
doggo      73
puppo      23
floofer    8
Name: dog_type, dtype: int64
```

[541]:
```
master_clean_1 = master_clean_1.sort_values('dog_type').
↪drop_duplicates('tweet_id', keep='last')
```

[547]:
```
master_clean_1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 23 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   int64
 1   timestamp           1971 non-null   object
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   int64
 6   rating_denominator  1971 non-null   int64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  p1                  1971 non-null   object
 13  p1_conf             1971 non-null   float64
 14  p1_dog              1971 non-null   object
 15  p2                  1971 non-null   object
```

```
 16  p2_conf             1971 non-null   float64
 17  p2_dog              1971 non-null   object
 18  p3                  1971 non-null   object
 19  p3_conf             1971 non-null   float64
 20  p3_dog              1971 non-null   object
 21  variable            1971 non-null   object
 22  dog_type            1971 non-null   object
dtypes: float64(6), int64(3), object(14)
memory usage: 369.6+ KB
```

[544]:
```
master_clean_1.dog_type.value_counts()
```

[544]:
```
None       1668
pupper      209
doggo        63
puppo        23
floofer       8
Name: dog_type, dtype: int64
```

[551]:
```
master_clean.columns
```

[551]:
```
Index(['tweet_id', 'timestamp', 'source', 'text', 'expanded_urls',
       'rating_numerator', 'rating_denominator', 'name', 'doggo', 'floofer',
       'pupper', 'puppo', 'favorite_count', 'retweet_count', 'jpg_url',
       'img_num', 'p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3',
       'p3_conf', 'p3_dog'],
      dtype='object')
```

[553]:
```
dog_types_df = master_clean.drop(['timestamp', 'source', 'text',␣
↪'expanded_urls',
      'rating_numerator', 'rating_denominator', 'name', 'favorite_count',␣
↪'retweet_count', 'jpg_url',
      'img_num', 'p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3',
      'p3_conf', 'p3_dog'], axis=1)
```

[558]:
```
pd.set_option("display.max_rows",73)
```

[560]:
```
dog_types_df = dog_types_df[dog_types_df.doggo=='doggo']
```

[594]:
```
error_ids =  []
error_ids = error_ids + dog_types_df[dog_types_df.floofer != 'None'].tweet_id.
↪to_list()
error_ids = error_ids + dog_types_df[dog_types_df.pupper != 'None'].tweet_id.
↪to_list()
error_ids = error_ids + dog_types_df[dog_types_df.puppo != 'None'].tweet_id.
↪to_list()
```

[603]:
```
for twt_id in error_ids:
    print(str(twt_id)+': ' + master_clean_1[master_clean_1.tweet_id == twt_id].
 ↪text)
    print('\n')
```

```
2123    854010172552949760: At first I thought this was a shy doggo, but it's
actually a Rare Canadian Floofer Owl. Amateurs would confuse the two. 11/10 only
send dogs https://t.co/TXdT3tmuYk
Name: text, dtype: object


6250    817777686764523521: This is Dido. She's playing the lead role in "Pupper
Stops to Catch Snow Before Resuming Shadow Box with Dried Apple." 13/10 (IG:
didodoggo) https://t.co/m7isZrOBX7
Name: text, dtype: object


6307    808106460588765185: Here we have Burke (pupper) and Dexter (doggo).
Pupper wants to be exactly like doggo. Both 12/10 would pet at same time
https://t.co/ANBpEYHaho
Name: text, dtype: object


6334    801115127852503040: This is Bones. He's being haunted by another doggo
of roughly the same size. 12/10 deep breaths pupper everything's fine
https://t.co/55Dqe0SJNj
Name: text, dtype: object


6419    785639753186217984: This is Pinot. He's a sophisticated doggo. You can
tell by the hat. Also pointier than your average pupper. Still 10/10 would pet
cautiously https://t.co/f2wmLZTPHd
Name: text, dtype: object


6561    759793422261743616: Meet Maggie &amp;amp; Lila. Maggie is the doggo, Lila is
the pupper. They are sisters. Both 12/10 would pet at the same time
https://t.co/MYwR4DQKll
Name: text, dtype: object


6613    751583847268179968: Please stop sending it pictures that don't even have
a doggo or pupper in them. Churlish af. 5/10 neat couch tho
https://t.co/u2c9c7qSg8
Name: text, dtype: object
```

```
6702    741067306818797568: This is just downright precious af. 12/10 for both
pupper and doggo https://t.co/o5J479bZUC
Name: text, dtype: object


6748    733109485275860992: Like father (doggo), like son (pupper). Both 12/10
https://t.co/pG2inLaOda
Name: text, dtype: object


4088    855851453814013952: Here's a puppo participating in the #ScienceMarch.
Cleverly disguising her own doggo agenda. 13/10 would keep the planet habitable
for https://t.co/cMhq16isel
Name: text, dtype: object
```

[608]:
```
for twt_id in error_ids:
    print(master_clean_1[master_clean_1.tweet_id == twt_id ].dog_type)
```

```
2123    floofer
Name: dog_type, dtype: object
6250    pupper
Name: dog_type, dtype: object
6307    pupper
Name: dog_type, dtype: object
6334    pupper
Name: dog_type, dtype: object
6419    pupper
Name: dog_type, dtype: object
6561    pupper
Name: dog_type, dtype: object
6613    pupper
Name: dog_type, dtype: object
6702    pupper
Name: dog_type, dtype: object
6748    pupper
Name: dog_type, dtype: object
4088    puppo
Name: dog_type, dtype: object
```

Change the following dog_types after checking tweet text:

- tweet_id['808106460588765185'] none
- tweet_id['785639753186217984'] doggo
- tweet_id['759793422261743616'] none
- tweet_id['751583847268179968'] none
- tweet_id['741067306818797568'] none
- tweet_id['733109485275860992'] none

- tweet_id['855851453814013952'] puppo

[619]:
```
# fixing dog_types column values
master_clean_1.at[master_clean_1.tweet_id == 817777686764523521, 'dog_type'] =␣
↪'None'
master_clean_1.at[master_clean_1.tweet_id == 785639753186217984, 'dog_type'] =␣
↪'doggo'
master_clean_1.at[master_clean_1.tweet_id == 759793422261743616, 'dog_type'] =␣
↪'None'
master_clean_1.at[master_clean_1.tweet_id == 751583847268179968, 'dog_type'] =␣
↪'None'
master_clean_1.at[master_clean_1.tweet_id == 741067306818797568, 'dog_type'] =␣
↪'None'
master_clean_1.at[master_clean_1.tweet_id == 733109485275860992, 'dog_type'] =␣
↪'None'
master_clean_1.at[master_clean_1.tweet_id == 855851453814013952, 'dog_type'] =␣
↪'puppo'
```

[625]:
```
master_clean_1.drop('variable', axis=1, inplace=True)
```

[626]:
```
master_clean_1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 22 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   int64
 1   timestamp           1971 non-null   object
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   int64
 6   rating_denominator  1971 non-null   int64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  p1                  1971 non-null   object
 13  p1_conf             1971 non-null   float64
 14  p1_dog              1971 non-null   object
 15  p2                  1971 non-null   object
 16  p2_conf             1971 non-null   float64
 17  p2_dog              1971 non-null   object
 18  p3                  1971 non-null   object
 19  p3_conf             1971 non-null   float64
```

```
 20  p3_dog              1971 non-null   object
 21  dog_type            1971 non-null   object
dtypes: float64(6), int64(3), object(13)
memory usage: 434.2+ KB
```

[627]:
```
master_clean = master_clean_1.copy()
```

[629]:
```
master_clean
```

[629]:
```
                tweet_id                  timestamp  \
1927  666776908487630848  2015-11-18 00:36:17 +0000
1926  666781792255496192  2015-11-18 00:55:42 +0000
1925  666786068205871104  2015-11-18 01:12:41 +0000
1924  666804364988780544  2015-11-18 02:25:23 +0000
1923  666817836334096384  2015-11-18 03:18:55 +0000
…                    …                        …
4749  738537504001953792  2016-06-03 01:07:16 +0000
3954  889665388333682689  2017-07-25 01:55:32 +0000
3956  889531135344209921  2017-07-24 17:02:04 +0000
4404  793195938047070209  2016-10-31 21:00:23 +0000
4020  874012996292530176  2017-06-11 21:18:31 +0000

                                                 source  \
1927  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
1926  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
1925  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
1924  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
1923  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
…
…
4749  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3954  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3956  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
4404  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
4020  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>

                                                  text  \
```

```
1927  This is Josep. He is a Rye Manganese mix. Can drive w eyes closed. Very
irresponsible. Menace on the roadways. 5/10 https://t.co/XNGeDwrtYH
1926  This is a purebred Bacardi named Octaviath. Can shoot spaghetti out of
mouth. 10/10 https://t.co/uEvsGLOFHa
1925  Unfamiliar with this breed. Ears pointy af. Won't let go of seashell.
Won't eat kibble. Not very fast. Bad dog 2/10 https://t.co/EIn5kElY1S
1924  This is Jockson. He is a Pinnacle Sagittarius. Fancy bandana. Enjoys
lightly sucking on hot dog in nature. 8/10 https://t.co/RdKbAOEpDK
1923  This is Jeph. He is a German Boston Shuttlecock. Enjoys couch. Lost body
during French Revolution. True hero 9/10 https://t.co/8whlkYw3mO
…
…
4749  This is Bayley. She fell asleep trying to escape her evil fence enclosure.
11/10 night night puppo https://t.co/AxSiqAKEKu
3954  Here's a puppo that seems to be on the fence about something haha no but
seriously someone help her. 13/10 https://t.co/BxvuXk0UCm
3956  This is Stuart. He's sporting his favorite fanny pack. Secretly filled
with bones only. 13/10 puppared puppo #BarkWeek https://t.co/y70o6h3isq
4404  Say hello to Lily. She's pupset that her costume doesn't fit as well as
last year. 12/10 poor puppo https://t.co/YSi6K1firY
4020  This is Sebastian. He can't see all the colors of the rainbow, but he can
see that this flag makes his human happy. 13/10 #PrideMonth puppo
https://t.co/XBE0evJZ6V

                                        expanded_urls  \
1927  https://twitter.com/dog_rates/status/666776908487630848/photo/1
1926  https://twitter.com/dog_rates/status/666781792255496192/photo/1
1925  https://twitter.com/dog_rates/status/666786068205871104/photo/1
1924  https://twitter.com/dog_rates/status/666804364988780544/photo/1
1923  https://twitter.com/dog_rates/status/666817836334096384/photo/1
…                                                                    …
4749  https://twitter.com/dog_rates/status/738537504001953792/photo/1,https://tw
itter.com/dog_rates/status/738537504001953792/photo/1
3954  https://twitter.com/dog_rates/status/889665388333682689/photo/1
3956  https://twitter.com/dog_rates/status/889531135344209921/photo/1
4404  https://twitter.com/dog_rates/status/793195938047070209/photo/1,https://tw
itter.com/dog_rates/status/793195938047070209/photo/1
4020  https://twitter.com/dog_rates/status/874012996292530176/photo/1,https://tw
itter.com/dog_rates/status/874012996292530176/photo/1

      rating_numerator  rating_denominator       name  favorite_count  \
1927  5                 10                   Josep      323.0
1926  10                10                   a          361.0
1925  2                 10                   None       709.0
1924  8                 10                   Jockson    219.0
1923  9                 10                   Jeph       478.0
…   ..                ..                   …          …
```

```
4749  11                10                  Bayley     5004.0
3954  13                10                  None       44545.0
3956  13                10                  Stuart     14059.0
4404  12                10                  Lily       15388.0
4020  13                10                  Sebastian  31902.0

      retweet_count                                        jpg_url  img_num  \
1927  158.0          https://pbs.twimg.com/media/CUDeDoWUYAAD-EM.jpg  1.0
1926  176.0          https://pbs.twimg.com/media/CUDigRXXIAATI_H.jpg  1.0
1925  448.0          https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg  1.0
1924  84.0           https://pbs.twimg.com/media/CUD3A7YWoAA82N0.jpg  1.0
1923  235.0          https://pbs.twimg.com/media/CUEDSMEWEAAuXVZ.jpg  1.0
…     …                                                    …  …
4749  1496.0         https://pbs.twimg.com/media/Cj_P7rSUgAAYQbz.jpg  1.0
3954  8973.0         https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg  1.0
3956  2026.0         https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg  1.0
4404  5666.0         https://pbs.twimg.com/media/CwH_foYWgAEvTyI.jpg  2.0
4020  9249.0         https://pbs.twimg.com/media/DCEeLxjXsAAvNSM.jpg  2.0

                        p1   p1_conf p1_dog                 p2   p2_conf  \
1927  seat_belt            0.375057  False  miniature_pinscher  0.167175
1926  Italian_greyhound    0.618316  True   Weimaraner          0.151363
1925  snail                0.999888  False  slug                0.000055
1924  English_setter       0.328792  True   Brittany_spaniel    0.283545
1923  miniature_schnauzer  0.496953  True   standard_schnauzer  0.285276
…                     …       …    …                    …        …
4749  chow                 0.808737  True   gibbon              0.028942
3954  Pembroke             0.966327  True   Cardigan            0.027356
3956  golden_retriever     0.953442  True   Labrador_retriever  0.013834
4404  Labrador_retriever   0.654762  True   golden_retriever    0.074100
4020  Cardigan             0.806674  True   Pembroke            0.116622

     p2_dog               p3   p3_conf p3_dog dog_type
1927  True   Chihuahua        0.086951  True   None
1926  True   vizsla           0.085989  True   None
1925  False  acorn            0.000026  False  None
1924  True   Ibizan_hound     0.057461  True   None
1923  True   giant_schnauzer  0.073764  True   None
…     …                 …       …    …    …
4749  False  Pembroke         0.026498  True   puppo
3954  True   basenji          0.004633  True   puppo
3956  True   redbone          0.007958  True   puppo
4404  True   Chihuahua        0.042339  True   puppo
4020  True   kelpie           0.049182  True   puppo

[1971 rows x 22 columns]
```

4-Extract dog_breed and its confidence

[650]:
```
dog_breed = []
dog_breed_conf = []
for index,row in master_clean.iterrows():
    if row['p1_dog'] == True:
        dog_breed.append(row['p1'])
        dog_breed_conf.append(row['p1_conf'])
    elif row['p2_dog'] == True:
        dog_breed.append(row['p2'])
        dog_breed_conf.append(row['p2_conf'])
    elif row['p3_dog'] == True:
        dog_breed.append(row['p3'])
        dog_breed_conf.append(row['p3_conf'])
    else:
        dog_breed.append('unkown')
        dog_breed_conf.append(0)
```

[651]:
```
# add 'dog_breed' and 'dog_breed_confidence'
master_clean['dog_breed'] = dog_breed
master_clean['dog_breed_conf'] = dog_breed_conf
```

[652]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 24 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   int64
 1   timestamp           1971 non-null   object
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   int64
 6   rating_denominator  1971 non-null   int64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  p1                  1971 non-null   object
 13  p1_conf             1971 non-null   float64
 14  p1_dog              1971 non-null   object
 15  p2                  1971 non-null   object
 16  p2_conf             1971 non-null   float64
 17  p2_dog              1971 non-null   object
 18  p3                  1971 non-null   object
```

```
 19  p3_conf             1971 non-null   float64
 20  p3_dog              1971 non-null   object
 21  dog_type            1971 non-null   object
 22  dog_breed           1971 non-null   object
 23  dog_breed_conf      1971 non-null   float64
dtypes: float64(7), int64(3), object(14)
memory usage: 465.0+ KB
```

[653]:
```
# drop unnecessary columns
master_clean.drop(['p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3',␣
 ↪'p3_conf', 'p3_dog' ], axis=1, inplace=True)
```

[654]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   int64
 1   timestamp           1971 non-null   object
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   int64
 6   rating_denominator  1971 non-null   int64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  dog_type            1971 non-null   object
 13  dog_breed           1971 non-null   object
 14  dog_breed_conf      1971 non-null   float64
dtypes: float64(4), int64(3), object(8)
memory usage: 326.4+ KB
```

5- Remove '+0000' from 'timestamp' column

[676]:
```
master_clean.timestamp = master_clean.timestamp.str.split('+').str[0]
```

[678]:
```
master_clean.sample(5)
```

[678]:

	tweet_id	timestamp
2662	752917284578922496	2016-07-12 17:27:23
3149	691675652215414786	2016-01-25 17:35:00
9	890240255349198849	2017-07-26 15:59:51
7539	672481316919734272	2015-12-03 18:23:34

```
3300  682003177596559360  2015-12-30 01:00:03

  source  \
2662  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3149  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
9     <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
7539  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>
3300  <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</a>

text  \
2662  This is Grizzie. She's a semi-submerged Bahraini Buttersplotch. Appears
alert af. Snazzy tongue. 11/10 would def pet https://t.co/WZ4zzkXXnW
3149  This is Richie and Plip. They are the best of pals. Do everything
together. 10/10 for both https://t.co/KMdwNgONkV
9     This is Cassie. She is a college pup. Studying international doggo
communication and stick theory. 14/10 so elegant much sophisticate
https://t.co/t1bfwz5S2A
7539  Say hello to Jazz. She should be on the cover of Vogue. 12/10 gorgeous
pupper https://t.co/mVCMemhXAP
3300  Unique dog here. Wrinkly as hell. Weird segmented neck. Finger on fire.
Doesn't seem to notice. 5/10 might still pet https://t.co/Hy9La4xNX3

                                                    expanded_urls  \
2662  https://twitter.com/dog_rates/status/752917284578922496/photo/1
3149  https://twitter.com/dog_rates/status/691675652215414786/photo/1
9     https://twitter.com/dog_rates/status/890240255349198849/photo/1
7539  https://twitter.com/dog_rates/status/672481316919734272/photo/1
3300  https://twitter.com/dog_rates/status/682003177596559360/photo/1

      rating_numerator  rating_denominator     name  favorite_count  \
2662  11                10                  Grizzie  6885.0
3149  10                10                  Richie   NaN
9     14                10                  Cassie   29554.0
7539  12                10                  Jazz     687.0
3300  5                 10                  None     3065.0

      retweet_count                                          jpg_url  img_num  \
2662  1558.0         https://pbs.twimg.com/media/CnLmRiYXEAAO_8f.jpg  1.0
3149  NaN            https://pbs.twimg.com/media/CZlTVL4WkAEpVR5.jpg  1.0
9     6586.0         https://pbs.twimg.com/media/DFrEyVuW0AAO3t9.jpg  1.0
7539  122.0          https://pbs.twimg.com/media/CVUiMUeW4AEQgkU.jpg  1.0
3300  1485.0         https://pbs.twimg.com/media/CXb2RcDUsAEnkJb.jpg  1.0
```

```
     dog_type        dog_breed  dog_breed_conf
2662  None     German_shepherd  0.609283
3149  None     Chihuahua        0.182898
9     doggo    Pembroke         0.511319
7539  pupper   Border_collie    0.599454
3300  None     unkown           0.000000
```

6- Extract tweet source from source column

[694]:
```
source = []
for tweet_source in master_clean.source:
    src = re.findall(r'>(.+?)<', tweet_source)[0]
    source.append(src)
```

[695]:
```
master_clean.source = source
```

[699]:
```
master_clean.source.value_counts()
```

[699]:
```
Twitter for iPhone    1932
Twitter Web Client    28
TweetDeck             11
Name: source, dtype: int64
```

7- Fix Dog names

[757]:
```
# create a list of dog names from datafram
dog_names = master_clean.name
```

[758]:
```
# create list of wrong dog names by checking if names are lower
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
```

[759]:
```
# create a series to be able to get unique values
wrong_names = pd.Series(wrong_names)
wrong_names.value_counts()
```

[759]:
```
a              55
the             7
an              6
very            4
one             4
quite           3
just            3
getting         2
```

```
by              1
incredibly      1
light           1
space           1
this            1
not             1
his             1
my              1
infuriating     1
all             1
unacceptable    1
officially      1
such            1
actually        1
dtype: int64
```

[760]:
```
df_names = master_clean[master_clean.name == 'a']
```

After visiual inspection, few names seems to be after the word 'named'

[763]:
```
correct_names = []
for index, row in df_names.iterrows():
    dog_name = re.findall(r'named(.*?)\.', row['text'])
    if dog_name:
        temp_list= []
        temp_list.append(row['tweet_id'])
        temp_list.append(dog_name[0].strip())
        correct_names.append(temp_list)
```

[764]:
```
correct_names
```

[764]:
```
[[666781792255496192, 'Octaviath'],
 [666983947667116034, 'Pepe'],
 [666701168228331520, 'Johm'],
 [667861340749471744, 'Cheryl'],
 [668171859951755264, 'Alfonso'],
 [667470559035432960, 'Kohl'],
 [667538891197542400, 'Klint'],
 [667773195014021121, 'Jessiga'],
 [671147085991960577, 'Rufus'],
 [671743150407421952, 'Jacob (Yacōb)'],
 [668955713004314625, 'Leroi'],
 [668507509523615744, 'Chuk'],
 [670303360680108032, 'Hemry'],
 [670361874861563904, 'Cherokee'],
 [670427002554466305, 'Spork'],
 [669564461267722241, 'Alfredo'],
```

```
[669923323644657664, 'Alphred'],
[675706639471788032, 'Wylie'],
[673636718965334016, 'Kip']]
```

[765]:
```
# change above names in dataframe
for pair in correct_names:
    master_clean.at[master_clean.tweet_id == pair[0], 'name'] = pair[1]
```

[768]:
```
# update list of wrong names
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
```

[769]:
```
wrong_names = pd.Series(wrong_names)
wrong_names.value_counts()
```

[769]:
```
a               36
the              7
an               6
very             4
one              4
quite            3
just             3
getting          2
by               1
incredibly       1
light            1
space            1
this             1
not              1
his              1
my               1
infuriating      1
all              1
unacceptable     1
officially       1
such             1
actually         1
dtype: int64
```

[770]:
```
df_names = master_clean[master_clean.name == 'a']
```

[780]:
```
# after inspection tweets with 'a' in the name column does not contain the name␣
 ↪of the dog except 1 tweet
master_clean.at[master_clean.tweet_id == 667177989038297088, 'name'] = 'Daryl'
a_list = df_names.tweet_id.to_list()
```

[782]:
```
for t_id in a_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[786]:
```
# update names lists
dog_names = master_clean.name
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
wrong_names = pd.Series(wrong_names)
wrong_names.value_counts()
```

[786]:
```
the             7
an              6
very            4
one             4
quite           3
just            3
getting         2
not             1
incredibly      1
light           1
space           1
this            1
his             1
my              1
infuriating     1
all             1
unacceptable    1
by              1
officially      1
such            1
actually        1
dtype: int64
```

[787]:
```
df_names = master_clean[master_clean.name == 'the']
```

[788]:
```
df_names
```

[788]:
```
                tweet_id             timestamp              source  \
1961  666058600524156928  2015-11-16 01:01:59   Twitter for iPhone
3167  690360449368465409  2016-01-22 02:28:52   Twitter for iPhone
1960  666063827256086533  2015-11-16 01:22:45   Twitter for iPhone
3631  671561002136281088  2015-12-01 05:26:34   Twitter for iPhone
3425  676613908052996102  2015-12-15 04:05:01   Twitter for iPhone
7350  677269281705472000  2015-12-16 23:29:14   Twitter for iPhone
7175  685943807276412928  2016-01-09 21:58:42   Twitter for iPhone
```

```
                                                                  text  \
1961  Here is the Rand Paul of retrievers folks! He's probably good at poker.
Can drink beer (lol rad). 8/10 good dog https://t.co/pYAJkAe76p
3167  Stop sending in lobsters. This is the final warning. We only rate dogs.
Thank you… 9/10 https://t.co/B9ZXXKJYNx
1960  This is the happiest dog you will ever see. Very committed owner. Nice
couch. 10/10 https://t.co/RhUEAloehK
3631  This is the best thing I've ever seen so spread it like wildfire &amp;
maybe we'll find the genius who created it. 13/10 https://t.co/q6RsuOVYwU
3425  This is the saddest/sweetest/best picture I've been sent. 12/10
https://t.co/vQ2Lw1BLBF
7350  This is the happiest pupper I've ever seen. 10/10 would trade lives with
https://t.co/ep8ATEJwRb
7175  This is the newly formed pupper a capella group. They're just starting out
but I see tons of potential. 8/10 for all https://t.co/wbAcvFoNtn

                                                        expanded_urls  \
1961  https://twitter.com/dog_rates/status/666058600524156928/photo/1
3167  https://twitter.com/dog_rates/status/690360449368465409/photo/1
1960  https://twitter.com/dog_rates/status/666063827256086533/photo/1
3631  https://twitter.com/dog_rates/status/671561002136281088/photo/1
3425  https://twitter.com/dog_rates/status/676613908052996102/photo/1
7350  https://twitter.com/dog_rates/status/677269281705472000/photo/1
7175  https://twitter.com/dog_rates/status/685943807276412928/video/1

      rating_numerator  rating_denominator name  favorite_count  \
1961  8                 10                  the  105.0
3167  9                 10                  the  2630.0
1960  10                10                  the  444.0
3631  13                10                  the  12132.0
3425  12                10                  the  1045.0
7350  10                10                  the  1921.0
7175  8                 10                  the  1601.0

      retweet_count  \
1961  52.0
3167  865.0
1960  195.0
3631  6809.0
3425  194.0
7350  684.0
7175  578.0

      jpg_url  \
1961  https://pbs.twimg.com/media/CT5Qw94XAAA_2dP.jpg
3167  https://pbs.twimg.com/media/CZSnKw8WwAAAN7q.jpg
```

```
1960  https://pbs.twimg.com/media/CT5Vg_wXIAAXfnj.jpg
3631  https://pbs.twimg.com/media/CVHdK-7WwAAsuyc.jpg
3425  https://pbs.twimg.com/media/CWPQwmJWUAAu_At.jpg
7350  https://pbs.twimg.com/media/CWYkOWxWoAAEwRt.jpg
7175  https://pbs.twimg.com/ext_tw_video_thumb/685943751555051520/pu/img/rlBvQWa
FPUMx1MTi.jpg
```

	img_num	dog_type	dog_breed	dog_breed_conf
1961	1.0	None	miniature_poodle	0.201493
3167	1.0	None	pug	0.686933
1960	1.0	None	golden_retriever	0.775930
3631	1.0	None	Gordon_setter	0.469373
3425	1.0	None	Doberman	0.096423
7350	1.0	pupper	Shetland_sheepdog	0.656616
7175	1.0	pupper	papillon	0.200812

[789]:
```
# after inspection 'the' value has no name in tweet
the_list = df_names.tweet_id.to_list()
for t_id in the_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[790]:
```
df_names = master_clean[master_clean.name == 'an']
```

[791]:
```
df_names
```

[791]:

	tweet_id	timestamp	source	text
1950	666287406224695296	2015-11-16 16:11:11	Twitter for iPhone	This is an Albanian 3 1/2 legged Episcopalian. Loves well-polished hardwood flooring. Penis on the collar. 9/10 https://t.co/d9NcXFKwLv
1948	666337882303524864	2015-11-16 19:31:45	Twitter for iPhone	This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall very nice. 9/10 would pet aggressively https://t.co/QpRjllzWAL
3026	703041949650034688	2016-02-26 02:20:37	Twitter for iPhone	This is an East African Chalupa Seal. We only rate dogs. Please only send in dogs. Thank you… 10/10 https://t.co/iHe6liLwWR
3794	668636665813057536	2015-11-23 03:46:18	Twitter for iPhone	This is an Irish Rigatoni terrier named Berta. Completely made of rope. No eyes. Quite large. Loves to dance. 10/10 https://t.co/EM5fDykrJg
1964	666051853826850816	2015-11-16 00:35:11	Twitter for iPhone	This is an odd dog. Hard on the outside but loving on the inside. Petting still fun. Doesn't play catch well. 2/10 https://t.co/v5A4vzSDdc
2727	746369468511756288	2016-06-24 15:48:42	Twitter for iPhone	This is an Iraqi Speed Kangaroo. It is not a dog. Please only send in dogs. I'm very angry with all of you …9/10 https://t.co/5qpBTTpgUt

```
                                                          expanded_urls  \
1950  https://twitter.com/dog_rates/status/666287406224695296/photo/1
1948  https://twitter.com/dog_rates/status/666337882303524864/photo/1
3026  https://twitter.com/dog_rates/status/703041949650034688/photo/1
3794  https://twitter.com/dog_rates/status/668636665813057536/photo/1
1964  https://twitter.com/dog_rates/status/666051853826850816/photo/1
2727  https://twitter.com/dog_rates/status/746369468511756288/photo/1

      rating_numerator  rating_denominator name  favorite_count  \
1950  1                 2                   an   134.0
1948  9                 10                  an   180.0
3026  10                10                  an   25891.0
3794  10                10                  an   982.0
1964  2                 10                  an   1112.0
2727  9                 10                  an   6109.0

      retweet_count                                        jpg_url  img_num  \
1950  59.0          https://pbs.twimg.com/media/CT8g3BpUEAAuFjg.jpg  1.0
1948  82.0          https://pbs.twimg.com/media/CT9OwFIWEAMuRje.jpg  1.0
3026  12221.0       https://pbs.twimg.com/media/CcG07BYW0AErrC9.jpg  1.0
3794  464.0         https://pbs.twimg.com/media/CUd5gBGWwAA0IVA.jpg  1.0
1964  762.0         https://pbs.twimg.com/media/CT5KoJ1WoAAJash.jpg  1.0
2727  1610.0        https://pbs.twimg.com/media/ClujESVXEAA4uH8.jpg  1.0

     dog_type        dog_breed  dog_breed_conf
1950  None     Maltese_dog      0.857531
1948  None     Newfoundland     0.278407
3026  None     unkown           0.000000
3794  None     komondor         0.999956
1964  None     unkown           0.000000
2727  None     German_shepherd  0.622957
```

[792]:
```
an_list = df_names.tweet_id.to_list()
for t_id in an_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[793]:
```
df_names = master_clean[master_clean.name == 'very']
```

[794]:
```
df_names
```

[794]:
```
                tweet_id            timestamp              source  \
3046  700747788515020802  2016-02-19 18:24:26   Twitter for iPhone
2733  745422732645535745  2016-06-22 01:06:43   Twitter for iPhone
2791  736225175608430592  2016-05-27 15:58:54   Twitter for iPhone
2563  770655142660169732  2016-08-30 16:11:18   Twitter for iPhone

                                                      text  \
```

```
3046  We only rate dogs. Pls stop sending in non-canines like this Mongolian
grass snake. This is very frustrating. 11/10 https://t.co/22x9SbCYCU
2733  We only rate dogs. Pls stop sending in non-canines like this Jamaican Flop
Seal. This is very very frustrating. 9/10 https://t.co/nc53zEN0hZ
2791  We only rate dogs. Please stop sending in non-canines like this Alaskan
Flop Turtle. This is very frustrating. 10/10 https://t.co/qXteK6Atxc
2563  We only rate dogs. Pls stop sending in non-canines like this Arctic Floof
Kangaroo. This is very frustrating. 11/10 https://t.co/qlUDuPoE3d

                                                          expanded_urls  \
3046  https://twitter.com/dog_rates/status/700747788515020802/photo/1
2733  https://twitter.com/dog_rates/status/745422732645535745/photo/1
2791  https://twitter.com/dog_rates/status/736225175608430592/photo/1
2563  https://twitter.com/dog_rates/status/770655142660169732/photo/1

      rating_numerator  rating_denominator  name  favorite_count  \
3046  11                10                  very  22453.0
2733  9                 10                  very  8466.0
2791  10                10                  very  7969.0
2563  11                10                  very  7330.0

      retweet_count                                          jpg_url  img_num  \
3046  9100.0         https://pbs.twimg.com/media/CbmOY41UAAQylmA.jpg  1.0
2733  2395.0         https://pbs.twimg.com/media/ClhGBCAWIAAFCsz.jpg  1.0
2791  2722.0         https://pbs.twimg.com/media/CjeY5DKXEAA3WkD.jpg  1.0
2563  1760.0         https://pbs.twimg.com/media/CrHqwjWXgAAgJSe.jpg  1.0

     dog_type           dog_breed  dog_breed_conf
3046  None     Great_Pyrenees      0.481333
2733  None     Labrador_retriever  0.663800
2791  None     Labrador_retriever  0.399217
2563  None     unkown              0.000000
```

[795]:
```
very_list = df_names.tweet_id.to_list()
for t_id in very_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[796]:
```
df_names = master_clean[master_clean.name == 'one']
```

[797]:
```
df_names
```

[797]:
```
                tweet_id             timestamp              source  \
2243  828650029636317184  2017-02-06 17:02:17   Twitter for iPhone
2706  748575535303884801  2016-06-30 17:54:50   Twitter for iPhone
677   755206590534418437  2016-07-19 01:04:16   Twitter for iPhone
7474  673956914389192708  2015-12-07 20:07:04   Twitter for iPhone
```

```
                                                                text  \
2243  Occasionally, we're sent fantastic stories. This is one of them. 14/10 for
Grace https://t.co/bZ4axuH6OK
2706  This is one of the most reckless puppers I've ever seen. How she got a
license in the first place is beyond me. 6/10 https://t.co/z5bAdtn9kd
677   This is one of the most inspirational stories I've ever come across. I
have no words. 14/10 for both doggo and owner https://t.co/I5ld3eKD5k
7474  This is one esteemed pupper. Just graduated college. 10/10 what a champ
https://t.co/nyReCVRiyd

                                                        expanded_urls  \
2243  https://twitter.com/dog_rates/status/828650029636317184/photo/1,https://tw
itter.com/dog_rates/status/828650029636317184/photo/1,https://twitter.com/dog_ra
tes/status/828650029636317184/photo/1
2706  https://twitter.com/dog_rates/status/748575535303884801/photo/1
677   https://twitter.com/dog_rates/status/755206590534418437/photo/1,https://tw
itter.com/dog_rates/status/755206590534418437/photo/1,https://twitter.com/dog_ra
tes/status/755206590534418437/photo/1,https://twitter.com/dog_rates/status/75520
6590534418437/photo/1
7474  https://twitter.com/dog_rates/status/673956914389192708/photo/1

      rating_numerator  rating_denominator name  favorite_count  \
2243  14                10                    one  9480.0
2706  6                 10                    one  6008.0
677   14                10                    one  16325.0
7474  10                10                    one  1866.0

      retweet_count                                          jpg_url  img_num  \
2243  1336.0         https://pbs.twimg.com/media/C3_0yhCWEAETXj2.jpg  1.0
2706  1949.0         https://pbs.twimg.com/media/CmN5ecNWMAE6pnf.jpg  1.0
677   5305.0         https://pbs.twimg.com/media/CnsIT0WWcAAul8V.jpg  1.0
7474  903.0          https://pbs.twimg.com/media/CVpgPGwWoAEV7gG.jpg  1.0

     dog_type                    dog_breed  dog_breed_conf
2243  None     golden_retriever             0.649209
2706  None     soft-coated_wheaten_terrier  0.086499
677   doggo    unkown                       0.000000
7474  pupper   pug                          0.586161
```

[800]:
```
very_list = df_names.tweet_id.to_list()
for t_id in very_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[801]:
```
master_clean.at[master_clean.tweet_id ==          828650029636317184, 'name']␣
↪= 'Grace'
```

[802]:
```
master_clean.at[master_clean.tweet_id == 667177989038297088, 'name'] = 'Daryl'
```

[803]:
```
# update names lists
dog_names = master_clean.name
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
wrong_names = pd.Series(wrong_names)
wrong_names.value_counts()
```

[803]:
```
just            3
quite           3
getting         2
all             1
his             1
incredibly      1
light           1
space           1
this            1
infuriating     1
my              1
such            1
unacceptable    1
by              1
not             1
officially      1
actually        1
dtype: int64
```

[805]:
```
df_names = master_clean[master_clean.name == 'just']
```

[806]:
```
df_names
```

[806]:
```
                tweet_id             timestamp              source  \
3614  672125275208069120  2015-12-02 18:48:47   Twitter for iPhone
6702  741067306818797568  2016-06-10 00:39:48   Twitter for iPhone
7052  695095422348574720  2016-02-04 04:03:57   Twitter for iPhone

             text  \
3614  This is just impressive I have nothing else to say. 11/10
https://t.co/LquQZiZjJP
6702  This is just downright precious af. 12/10 for both pupper and doggo
https://t.co/o5J479bZUC
7052  This is just a beautiful pupper good shit evolution. 12/10
https://t.co/2L8pI0Z2Ib

                                                          expanded_urls  \
3614  https://twitter.com/dog_rates/status/672125275208069120/photo/1
```

```
6702  https://twitter.com/dog_rates/status/741067306818797568/photo/1
7052  https://twitter.com/dog_rates/status/695095422348574720/photo/1

      rating_numerator  rating_denominator  name  favorite_count  \
3614  11                10                  just  2270.0
6702  12                10                  just  9380.0
7052  12                10                  just NaN

      retweet_count                                          jpg_url  img_num  \
3614  1075.0         https://pbs.twimg.com/media/CVPeX2dWwAEwyaR.jpg  1.0
6702  3037.0         https://pbs.twimg.com/media/CkjMx99UoAM2B1a.jpg  1.0
7052 NaN             https://pbs.twimg.com/media/CaV5mRDXEAAR8iG.jpg  1.0

     dog_type         dog_breed  dog_breed_conf
3614  None     golden_retriever  0.000087
6702  None     golden_retriever  0.843799
7052  pupper   papillon          0.227784
```

[807]:
```
just_list = df_names.tweet_id.to_list()
for t_id in just_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[808]:
```
df_names = master_clean[master_clean.name == 'quite']
```

[809]:
```
df_names
```

[809]:
```
                tweet_id             timestamp              source  \
1941  666411507551481857  2015-11-17 00:24:19   Twitter for iPhone
2118  855459453768019968  2017-04-21 16:33:22   Twitter for iPhone
2105  859196978902773760  2017-05-02 00:04:57   Twitter for iPhone

    text  \
1941  This is quite the dog. Gets really excited when not in water. Not very
soft tho. Bad at fetch. Can't do tricks. 2/10 https://t.co/aMCTNWO94t
2118  Guys, we only rate dogs. This is quite clearly a bulbasaur. Please only
send dogs. Thank you… 12/10 human used pet, it's super effective
https://t.co/Xc7uj1C64x
2105  We only rate dogs. This is quite clearly a smol broken polar bear. We'd
appreciate if you only send dogs. Thank you… 12/10 https://t.co/g2nSyGenG9

                                      expanded_urls  \
1941  https://twitter.com/dog_rates/status/666411507551481857/photo/1
2118  https://twitter.com/dog_rates/status/855459453768019968/photo/1,https://tw
itter.com/dog_rates/status/855459453768019968/photo/1
2105  https://twitter.com/dog_rates/status/859196978902773760/video/1

      rating_numerator  rating_denominator   name  favorite_count  \
```

```
1941  2                 10                  quite  405.0
2118  12                10                  quite  28652.0
2105  12                10                  quite  85524.0

      retweet_count  \
1941  290.0
2118  7817.0
2105  28224.0

      jpg_url  \
1941  https://pbs.twimg.com/media/CT-RugiWIAELEaq.jpg
2118  https://pbs.twimg.com/media/C98z1ZAXsAEIFFn.jpg
2105  https://pbs.twimg.com/ext_tw_video_thumb/859196962498805762/pu/img/-yBpr4-
o4GJZECYE.jpg

      img_num dog_type         dog_breed  dog_breed_conf
1941  1.0      None     unkown             0.000000
2118  2.0      None     Blenheim_spaniel   0.389513
2105  1.0      None     malamute           0.216163
```

[810]:
```
quite_list = df_names.tweet_id.to_list()
for t_id in quite_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[811]:
```
df_names = master_clean[master_clean.name == 'getting']
```

[812]:
```
df_names
```

[812]:
```
                tweet_id             timestamp              source  \
3093  697259378236399616  2016-02-10 03:22:44   Twitter for iPhone
2768  740214038584557568  2016-06-07 16:09:13   Twitter for iPhone

                                                              text  \
3093  Please stop sending in saber-toothed tigers. This is getting ridiculous.
We only rate dogs.\n…8/10 https://t.co/iAeQNueou8
2768  This is getting incredibly frustrating. This is a Mexican Golden Beaver.
We only rate dogs. Only send dogs …10/10 https://t.co/0yolOOyD3X

                                                      expanded_urls  \
3093  https://twitter.com/dog_rates/status/697259378236399616/photo/1
2768  https://twitter.com/dog_rates/status/740214038584557568/photo/1

      rating_numerator  rating_denominator     name  favorite_count  \
3093  8                 10                  getting NaN
2768  10                10                  getting  6589.0

      retweet_count                                          jpg_url  img_num  \
```

```
3093 NaN             https://pbs.twimg.com/media/Ca0ps3AXEAAnp9m.jpg  1.0
2768  1927.0         https://pbs.twimg.com/media/CkXEu2OUoAAs8yU.jpg  1.0

     dog_type                 dog_breed  dog_breed_conf
3093  None     Great_Dane                0.999223
2768  None     Chesapeake_Bay_retriever  0.586414
```

[814]:
```
getting_list = df_names.tweet_id.to_list()
for t_id in getting_list:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[815]:
```
# update names lists
dog_names = master_clean.name
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
wrong_names = pd.Series(wrong_names)
wrong_names.value_counts()
```

[815]:
```
all             1
such            1
officially      1
by              1
unacceptable    1
light           1
infuriating     1
my              1
his             1
this            1
space           1
not             1
incredibly      1
actually        1
dtype: int64
```

[816]:
```
master_clean[master_clean.name == 'all']
```

[816]:
```
                tweet_id             timestamp              source  \
6772  728035342121635841  2016-05-05 01:35:26   Twitter for iPhone

      text  \
6772  This is all I want in my life. 12/10 for super sleepy pupper
https://t.co/4RlLA5ObMh

                                          expanded_urls  \
6772  https://twitter.com/dog_rates/status/728035342121635841/photo/1,https://tw
```

```
itter.com/dog_rates/status/728035342121635841/photo/1

      rating_numerator  rating_denominator name  favorite_count  \
6772  12                10                  all  4475.0

      retweet_count                                          jpg_url  img_num  \
6772  1630.0         https://pbs.twimg.com/media/ChqARqmWsAEI6fB.jpg  1.0

     dog_type   dog_breed  dog_breed_conf
6772  pupper   Pomeranian  0.248664
```

[817]:
```
master_clean.at[master_clean.tweet_id == 728035342121635841, 'name'] = 'Unkown'
```

[818]:
```
master_clean[master_clean.name == 'such']
```

[818]:
```
                tweet_id             timestamp              source  \
1992  887517139158093824  2017-07-19 03:39:09   Twitter for iPhone

                                                      text  \
1992  I've yet to rate a Venezuelan Hover Wiener. This is such an honor. 14/10
paw-inspiring af (IG: roxy.thedoxy) https://t.co/20VrLAA8ba

                                                        expanded_urls  \
1992  https://twitter.com/dog_rates/status/887517139158093824/video/1

      rating_numerator  rating_denominator  name  favorite_count  \
1992  14                10                  such  43015.0

      retweet_count  \
1992  10578.0

      jpg_url  \
1992  https://pbs.twimg.com/ext_tw_video_thumb/887517108413886465/pu/img/WanJKws
sZj4VJvL9.jpg

      img_num dog_type dog_breed  dog_breed_conf
1992  1.0      None     unkown    0.0
```

[819]:
```
master_clean.at[master_clean.tweet_id == 887517139158093824, 'name'] = 'Unkown'
```

[820]:
```
master_clean[master_clean.name == 'officially']
```

[820]:
```
                tweet_id             timestamp              source  \
3363  679111216690831360  2015-12-22 01:28:25   Twitter for iPhone

 text  \
3363  This is officially the greatest yawn of all time. 12/10
```

```
https://t.co/4R0Cc0sLVE

                                                    expanded_urls  \
3363  https://twitter.com/dog_rates/status/679111216690831360/video/1

      rating_numerator  rating_denominator        name  favorite_count  \
3363  12                10                  officially  5835.0

      retweet_count  \
3363  2514.0

      jpg_url  \
3363  https://pbs.twimg.com/ext_tw_video_thumb/679111114081370114/pu/img/hFca8BH
jRopgD0cM.jpg

      img_num dog_type dog_breed  dog_breed_conf
3363  1.0      None     kelpie    0.189423
```

[821]:
```
master_clean[master_clean.name == 'by']
```

[821]:
```
                tweet_id             timestamp     source  \
3342  680085611152338944  2015-12-24 18:00:19   TweetDeck

                                                          text  \
3342  This is by far the most coordinated series of pictures I was sent.
Downright impressive in every way. 12/10 for all https://t.co/etzLo3sdZE

                      expanded_urls  \
3342  https://twitter.com/dog_rates/status/680085611152338944/photo/1,https://tw
itter.com/dog_rates/status/680085611152338944/photo/1,https://twitter.com/dog_ra
tes/status/680085611152338944/photo/1

      rating_numerator  rating_denominator name  favorite_count  \
3342  12                10                  by   12572.0

      retweet_count                                        jpg_url  img_num  \
3342  8773.0         https://pbs.twimg.com/media/CXAiiHUWkAIN_28.jpg  3.0

     dog_type dog_breed  dog_breed_conf
3342  None     unkown    0.0
```

[822]:
```
for name in wrong_names:
    print(master_clean[master_clean.name == name].text)
```

```
3312    This is actually a lion. We only rate dogs. For the last time please
only send dogs. Thank u.\n12/10 would still pet https://t.co/Pp26dMQxap
Name: text, dtype: object
```

```
3342    This is by far the most coordinated series of pictures I was sent.
Downright impressive in every way. 12/10 for all https://t.co/etzLo3sdZE
Name: text, dtype: object
2937    We   only   rate   dogs. Pls stop sending in non-canines like this
Dutch Panda Worm. This is infuriating. 11/10 https://t.co/odfLzBonG2
Name: text, dtype: object
3596    This is light saber pup. Ready to fight off evil with light saber. 10/10
true hero https://t.co/LPPa3btIIt
Name: text, dtype: object
3625    This is space pup. He's very confused. Tries to moonwalk at one point.
Super spiffy uniform. 13/10 I love space pup https://t.co/SfPQ2KeLdq
Name: text, dtype: object
3363    This is officially the greatest yawn of all time. 12/10
https://t.co/4R0Cc0sLVE
Name: text, dtype: object
2372    We only rate dogs. Please stop sending in non-canines like this Freudian
Poof Lion. This is incredibly frustrating… 11/10 https://t.co/IZidSrBvhi
Name: text, dtype: object
Series([], Name: text, dtype: object)
2589    This is my dog. Her name is Zoey. She knows I've been rating other dogs.
She's not happy. 13/10 no bias at all https://t.co/ep1NkYoiwB
Name: text, dtype: object
2701    What jokester sent in a pic without a dog in it? This is not
@rock_rates. This is @dog_rates. Thank you …10/10 https://t.co/nDPaYHrtNX
Name: text, dtype: object
2814    We only rate dogs. Pls stop sending non-canines like this Bulgarian
Eyeless Porch Bear. This is unacceptable… 9/10 https://t.co/2yctWAUZ3Z
Name: text, dtype: object
2813    Say hello to this unbelievably well behaved squad of doggos. 204/170
would try to pet all at once https://t.co/yGQI3He3xv
Name: text, dtype: object
734    That is Quizno. This is his beach. He does not tolerate human shenanigans
on his beach. 10/10 reclaim ur land doggo https://t.co/vdr7DaRSa7
Name: text, dtype: object
Series([], Name: text, dtype: object)
```

[840]:
```
temp = master_clean[master_clean.name == 'my'].tweet_id.values[0]
```

[842]:
```
master_clean.at[master_clean.tweet_id == temp, 'name'] = 'Zoey'
```

[843]:
```
# update names lists
dog_names = master_clean.name
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
wrong_names = pd.Series(wrong_names)
```

```
wrong_names.value_counts()
```

[843]:
```
infuriating     1
this            1
his             1
officially      1
space           1
by              1
unacceptable    1
light           1
not             1
incredibly      1
actually        1
dtype: int64
```

[845]:
```
master_clean_1 = master_clean.copy()
```

[850]:
```
wrong_names_id = []
for index, row in master_clean.iterrows():
    if row['name'].islower():
        wrong_names_id.append(row['tweet_id'])
```

[851]:
```
wrong_names_id
```

[851]:
```
[681297372102656000,
 680085611152338944,
 710272297844797440,
 672482722825261057,
 671789708968640512,
 679111216690831360,
 806219024703037440,
 748977405889503236,
 730924654643314689,
 731156023742988288,
 748692773788876800]
```

[852]:
```
for t_id in wrong_names_id:
    master_clean.at[master_clean.tweet_id == t_id, 'name'] = 'Unkown'
```

[854]:
```
# update names lists
dog_names = master_clean.name
wrong_names = []
for name in dog_names:
    if name.islower():
        wrong_names.append(name)
```

[859]:
```
# no more wrong names
wrong_names
```

[859]:
```
[]
```

[860]:
```
master_clean_1 = master_clean.copy()
```

8- Fix rating_numerator and rating_denominator

[435]:
```
# twitter_archive_clean[twitter_archive_clean.rating_numerator < 10]
```

[871]:
```
# extract rate from tweet and form a list for each of the num. and den.
numerators = []
denominators = []
for tweet in master_clean.text:
    rating_string = re.findall(r'\d+(?:\.\d+)?/\d+',tweet)[-1]
    rate = rating_string.split('/')
    num = rate[0]
    den = rate[1]
    numerators.append(float(num))
    denominators.append(float(den))
```

[873]:
```
len(numerators)
```

[873]:
```
1971
```

[877]:
```
len(denominators)
```

[877]:
```
1971
```

[874]:
```
# replace ratting_numerator and rating_denominator with correct values
master_clean.rating_numerator = numerators
master_clean.rating_denominator = denominators
```

[875]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   object
 1   timestamp           1971 non-null   datetime64[ns]
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   float64
```

```
 6   rating_denominator  1971 non-null   float64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  dog_type            1971 non-null   category
 13  dog_breed           1971 non-null   object
 14  dog_breed_conf      1971 non-null   float64
dtypes: category(1), datetime64[ns](1), float64(6), object(7)
memory usage: 313.1+ KB
```

[876]:
```
master_clean.rating_denominator.unique()
```

[876]:
```
array([ 10., 110.,  50.,  80.,  90.,  40., 120.,   7.,  70., 150., 170.])
```

9- Change 'tweet_id' type to str

[865]:
```
# Convert tweet_id to str
master_clean.tweet_id = master_clean.tweet_id.astype(str)
```

10- Change 'timestamp' type to datetime

[866]:
```
# Convert timestamp to datetime
master_clean.timestamp = pd.to_datetime(master_clean.timestamp)
```

[880]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   object
 1   timestamp           1971 non-null   datetime64[ns]
 2   source              1971 non-null   object
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   float64
 6   rating_denominator  1971 non-null   float64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  img_num             1971 non-null   float64
 12  dog_type            1971 non-null   category
 13  dog_breed           1971 non-null   object
```

```
 14  dog_breed_conf      1971 non-null   float64
dtypes: category(1), datetime64[ns](1), float64(6), object(7)
memory usage: 313.1+ KB
```

11- Change 'dog_type' type to category

[870]:
```
master_clean.dog_type = master_clean.dog_type.astype('category')
```

12- Change 'source' type to category

[881]:
```
master_clean.source = master_clean.source.astype('category')
```

[882]:
```
master_clean.expanded_urls
```

[882]:
```
1927    https://twitter.com/dog_rates/status/666776908487630848/photo/1
1926    https://twitter.com/dog_rates/status/666781792255496192/photo/1
1925    https://twitter.com/dog_rates/status/666786068205871104/photo/1
1924    https://twitter.com/dog_rates/status/666804364988780544/photo/1
1923    https://twitter.com/dog_rates/status/666817836334096384/photo/1
                                      ...
4749    https://twitter.com/dog_rates/status/738537504001953792/photo/1,https://
twitter.com/dog_rates/status/738537504001953792/photo/1
3954    https://twitter.com/dog_rates/status/889665388333682689/photo/1
3956    https://twitter.com/dog_rates/status/889531135344209921/photo/1
4404    https://twitter.com/dog_rates/status/793195938047070209/photo/1,https://
twitter.com/dog_rates/status/793195938047070209/photo/1
4020    https://twitter.com/dog_rates/status/874012996292530176/photo/1,https://
twitter.com/dog_rates/status/874012996292530176/photo/1
Name: expanded_urls, Length: 1971, dtype: object
```

13- Rename some columns

[922]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 14 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   object
 1   timestamp           1971 non-null   datetime64[ns]
 2   source              1971 non-null   category
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   float64
 6   rating_denominator  1971 non-null   float64
 7   name                1971 non-null   object
```

```
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  dog_type            1971 non-null   category
 12  dog_breed           1971 non-null   object
 13  dog_breed_conf      1971 non-null   float64
dtypes: category(2), datetime64[ns](1), float64(5), object(6)
memory usage: 290.0+ KB
```

[884]:
```
master_clean.rename(columns={'expanded_urls': 'tweet_url', 'name': 'dog_name',␣
↪'jpg_url': 'img_url' })
```

[884]:
```
                tweet_id           timestamp              source  \
1927  666776908487630848 2015-11-18 00:36:17  Twitter for iPhone
1926  666781792255496192 2015-11-18 00:55:42  Twitter for iPhone
1925  666786068205871104 2015-11-18 01:12:41  Twitter for iPhone
1924  666804364988780544 2015-11-18 02:25:23  Twitter for iPhone
1923  666817836334096384 2015-11-18 03:18:55  Twitter for iPhone
…                    …                  …                   …
4749  738537504001953792 2016-06-03 01:07:16  Twitter for iPhone
3954  889665388333682689 2017-07-25 01:55:32  Twitter for iPhone
3956  889531135344209921 2017-07-24 17:02:04  Twitter for iPhone
4404  793195938047070209 2016-10-31 21:00:23  Twitter for iPhone
4020  874012996292530176 2017-06-11 21:18:31  Twitter for iPhone

                                                   text  \
1927  This is Josep. He is a Rye Manganese mix. Can drive w eyes closed. Very
irresponsible. Menace on the roadways. 5/10 https://t.co/XNGeDwrtYH
1926  This is a purebred Bacardi named Octaviath. Can shoot spaghetti out of
mouth. 10/10 https://t.co/uEvsGLOFHa
1925  Unfamiliar with this breed. Ears pointy af. Won't let go of seashell.
Won't eat kibble. Not very fast. Bad dog 2/10 https://t.co/EIn5kElY1S
1924  This is Jockson. He is a Pinnacle Sagittarius. Fancy bandana. Enjoys
lightly sucking on hot dog in nature. 8/10 https://t.co/RdKbAOEpDK
1923  This is Jeph. He is a German Boston Shuttlecock. Enjoys couch. Lost body
during French Revolution. True hero 9/10 https://t.co/8whlkYw3mO
…
…
4749  This is Bayley. She fell asleep trying to escape her evil fence enclosure.
11/10 night night puppo https://t.co/AxSiqAKEKu
3954  Here's a puppo that seems to be on the fence about something haha no but
seriously someone help her. 13/10 https://t.co/BxvuXk0UCm
3956  This is Stuart. He's sporting his favorite fanny pack. Secretly filled
with bones only. 13/10 puppared puppo #BarkWeek https://t.co/y70o6h3isq
4404  Say hello to Lily. She's pupset that her costume doesn't fit as well as
last year. 12/10 poor puppo https://t.co/YSi6K1firY
4020  This is Sebastian. He can't see all the colors of the rainbow, but he can
```

```
see that this flag makes his human happy. 13/10 #PrideMonth puppo
https://t.co/XBE0evJZ6V

                                                tweet_url  \
1927  https://twitter.com/dog_rates/status/666776908487630848/photo/1
1926  https://twitter.com/dog_rates/status/666781792255496192/photo/1
1925  https://twitter.com/dog_rates/status/666786068205871104/photo/1
1924  https://twitter.com/dog_rates/status/666804364988780544/photo/1
1923  https://twitter.com/dog_rates/status/666817836334096384/photo/1
…                                                                   …
4749  https://twitter.com/dog_rates/status/738537504001953792/photo/1,https://tw
itter.com/dog_rates/status/738537504001953792/photo/1
3954  https://twitter.com/dog_rates/status/889665388333682689/photo/1
3956  https://twitter.com/dog_rates/status/889531135344209921/photo/1
4404  https://twitter.com/dog_rates/status/793195938047070209/photo/1,https://tw
itter.com/dog_rates/status/793195938047070209/photo/1
4020  https://twitter.com/dog_rates/status/874012996292530176/photo/1,https://tw
itter.com/dog_rates/status/874012996292530176/photo/1

      rating_numerator  rating_denominator   dog_name  favorite_count  \
1927  5.0               10.0                Josep     323.0
1926  10.0              10.0                Octaviath 361.0
1925  2.0               10.0                None      709.0
1924  8.0               10.0                Jockson   219.0
1923  9.0               10.0                Jeph      478.0
…   …                 …                   …         …
4749  11.0              10.0                Bayley    5004.0
3954  13.0              10.0                None      44545.0
3956  13.0              10.0                Stuart    14059.0
4404  12.0              10.0                Lily      15388.0
4020  13.0              10.0                Sebastian 31902.0

      retweet_count                                          img_url  img_num  \
1927  158.0          https://pbs.twimg.com/media/CUDeDoWUYAAD-EM.jpg  1.0
1926  176.0          https://pbs.twimg.com/media/CUDigRXXIAATI_H.jpg  1.0
1925  448.0          https://pbs.twimg.com/media/CUDmZIkWcAAIPPe.jpg  1.0
1924  84.0           https://pbs.twimg.com/media/CUD3A7YWoAA82N0.jpg  1.0
1923  235.0          https://pbs.twimg.com/media/CUEDSMEWEAAuXVZ.jpg  1.0
…     …                                                        …  …
4749  1496.0         https://pbs.twimg.com/media/Cj_P7rSUgAAYQbz.jpg  1.0
3954  8973.0         https://pbs.twimg.com/media/DFi579UWsAAatzw.jpg  1.0
3956  2026.0         https://pbs.twimg.com/media/DFg_2PVW0AEHN3p.jpg  1.0
4404  5666.0         https://pbs.twimg.com/media/CwH_foYWgAEvTyI.jpg  2.0
4020  9249.0         https://pbs.twimg.com/media/DCEeLxjXsAAvNSM.jpg  2.0

     dog_type            dog_breed  dog_breed_conf
1927  None     miniature_pinscher   0.167175
```

```
1926  None     Italian_greyhound    0.618316
1925  None     unkown               0.000000
1924  None     English_setter       0.328792
1923  None     miniature_schnauzer  0.496953
…     …                     …       …
4749  puppo    chow                 0.808737
3954  puppo    Pembroke             0.966327
3956  puppo    golden_retriever     0.953442
4404  puppo    Labrador_retriever   0.654762
4020  puppo    Cardigan             0.806674

[1971 rows x 15 columns]
```

[885]:
```
master_clean.drop('img_num', axis=1, inplace=True)
```

[886]:
```
master_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1971 entries, 1927 to 4020
Data columns (total 14 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   tweet_id            1971 non-null   object
 1   timestamp           1971 non-null   datetime64[ns]
 2   source              1971 non-null   category
 3   text                1971 non-null   object
 4   expanded_urls       1971 non-null   object
 5   rating_numerator    1971 non-null   float64
 6   rating_denominator  1971 non-null   float64
 7   name                1971 non-null   object
 8   favorite_count      1869 non-null   float64
 9   retweet_count       1869 non-null   float64
 10  jpg_url             1971 non-null   object
 11  dog_type            1971 non-null   category
 12  dog_breed           1971 non-null   object
 13  dog_breed_conf      1971 non-null   float64
dtypes: category(2), datetime64[ns](1), float64(5), object(6)
memory usage: 284.3+ KB
```

14- Fix dog breeds to have the same form

[1054]:
```
master_clean.dog_breed = master_clean.dog_breed.str.replace('_',' ').str.title()
```

[1055]:
```
master_clean.dog_breed
```

[1055]:
```
1927    Miniature Pinscher
1926    Italian Greyhound
```

```
1925    Unkown
1924    English Setter
1923    Miniature Schnauzer
              …
4749    Chow
3954    Pembroke
3956    Golden Retriever
4404    Labrador Retriever
4020    Cardigan
Name: dog_breed, Length: 1971, dtype: object
```

[1077]:
```
master_clean.to_csv('twitter_archive_master.csv')
```

1.1 Analyze data

[1056]:
```
master_clean.describe()
```

[1056]:

	rating_numerator	rating_denominator	favorite_count	retweet_count	\
count	1971.000000	1971.000000	1869.000000	1869.000000	
mean	12.156662	10.455099	8460.766185	2491.311396	
std	41.599303	6.789092	12318.026021	4428.810800	
min	0.000000	7.000000	70.000000	11.000000	
25%	10.000000	10.000000	1676.000000	538.000000	
50%	11.000000	10.000000	3841.000000	1208.000000	
75%	12.000000	10.000000	10655.000000	2855.000000	
max	1776.000000	170.000000	154171.000000	76442.000000	

	dog_breed_conf
count	1971.000000
mean	0.466219
std	0.339608
min	0.000000
25%	0.140969
50%	0.461076
75%	0.777087
max	0.999956

What is the average rating for all breeds of dogs?

[1057]:
```
# Check for outliers in ratings
master_clean.rating_numerator.sort_values().value_counts()
```

[1057]:
```
12.00      446
10.00      410
11.00      393
```

```
13.00      255
9.00       149
8.00       98
7.00       53
14.00      34
6.00       33
5.00       31
3.00       19
4.00       16
2.00       10
1.00       5
13.50      1
9.75       1
1776.00    1
420.00     1
24.00      1
44.00      1
45.00      1
60.00      1
80.00      1
84.00      1
88.00      1
144.00     1
204.00     1
11.26      1
165.00     1
11.27      1
99.00      1
121.00     1
0.00       1
Name: rating_numerator, dtype: int64
```

[1058]:
```
# Any rating above 14 is an outlier
rating_df = master_clean[master_clean.rating_numerator <= 14]
```

[1059]:
```
# Check for denominator outlier
rating_df.rating_denominator.unique()
```

[1059]:
```
array([10.])
```

[1060]:
```
rating_df.describe()
```

[1060]:
```
       rating_numerator  rating_denominator  favorite_count  retweet_count  \
count   1957.000000       1957.0              1856.000000     1856.000000
mean    10.529780         10.0                8479.998922     2495.275862
std     2.198629          0.0                 12349.723467    4441.039032
min     0.000000          10.0                70.000000       11.000000
```

```
25%     10.000000          10.0                 1658.000000      534.250000
50%     11.000000          10.0                 3874.000000      1207.000000
75%     12.000000          10.0                 10657.250000     2860.000000
max     14.000000          10.0                 154171.000000    76442.000000

        dog_breed_conf
count   1957.000000
mean    0.465802
std     0.339310
min     0.000000
25%     0.141257
50%     0.460710
75%     0.776346
max     0.999956
```

Average rating for all dog breeds = 10.53/10

[1093]:
```
sns.set_style('darkgrid')
```

What are the most rated breeds?

[1152]:
```
# dataframe containing stats of rating_numerator
rate_stats = rating_df[rating_df.dog_breed != 'Unkown'].groupby(['dog_breed']).
 ↪describe()['rating_numerator']
```

```
<Figure size 1080x720 with 0 Axes>
```

[1153]:
```
rate_stats.sort_values('count', ascending=False)
```

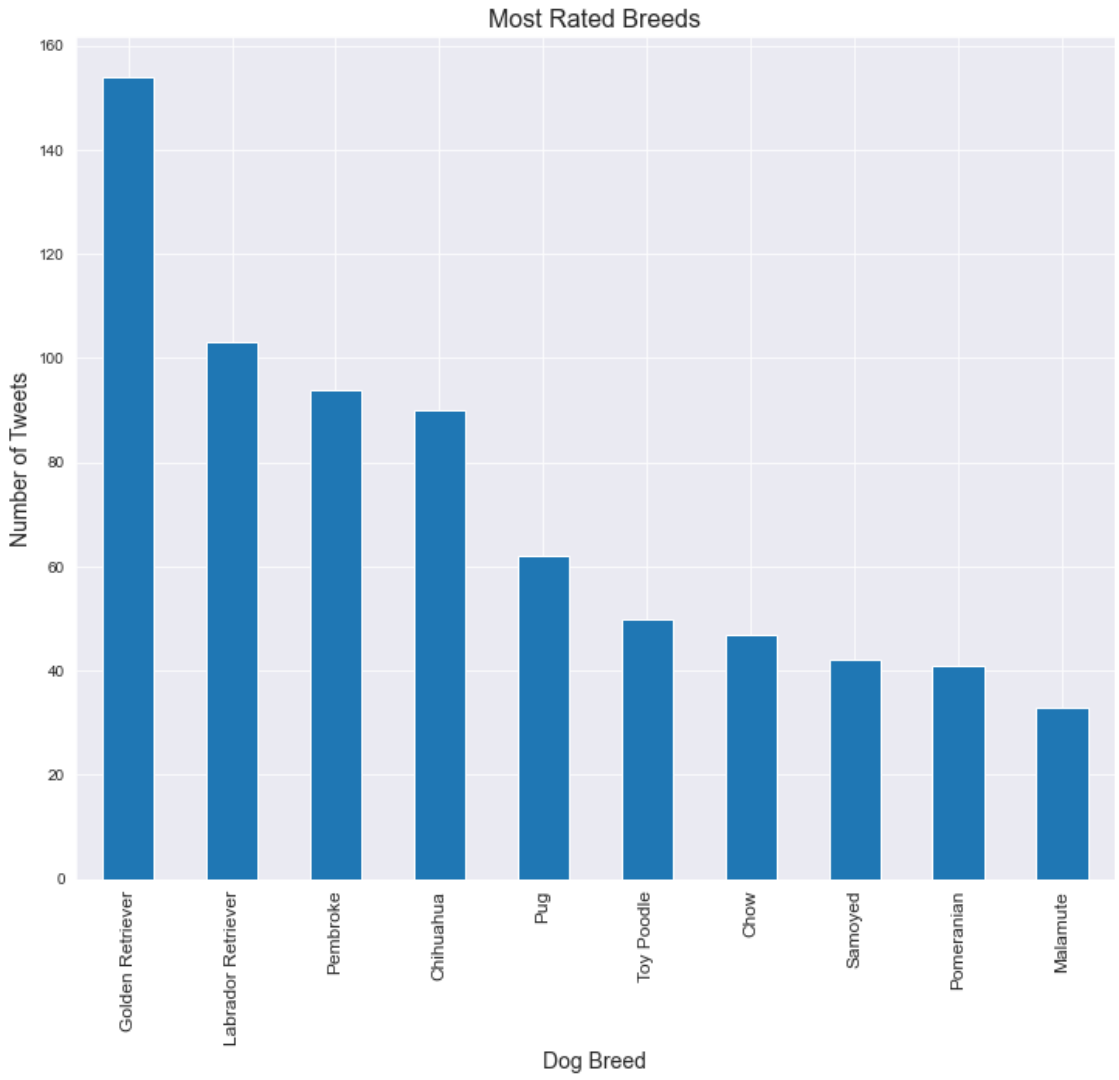
[1153]:

dog_breed	count	mean	std	min	25%	50%	75%	max
Golden Retriever	154.0	11.646104	1.185321	8.00	11.00	12.00	12.00	14.00
Labrador Retriever	103.0	11.174757	1.382149	7.00	10.00	11.00	12.00	
Pembroke	94.0	11.382979	1.802665	4.00	11.00	12.00	12.00	
Chihuahua	90.0	10.466667	2.121055	3.00	9.25	11.00	12.00	
Pug	62.0	10.241935	1.816910	3.00	9.25	10.00	11.00	
…	…	…	…	…	…	…	…	
Bouvier Des Flandres	1.0	13.000000	NaN	13.00	13.00	13.00	13.00	
Standard Schnauzer	1.0	12.000000	NaN	12.00	12.00	12.00	12.00	
Clumber	1.0	11.270000	NaN	11.27	11.27	11.27	11.27	
Silky Terrier	1.0	12.000000	NaN	12.00	12.00	12.00	12.00	
Entlebucher	1.0	11.000000	NaN	11.00	11.00	11.00	11.00	

```
Labrador Retriever    14.00
Pembroke              14.00
Chihuahua             14.00
Pug                   13.00
…                     …
Bouvier Des Flandres  13.00
Standard Schnauzer    12.00
Clumber               11.27
Silky Terrier         12.00
Entlebucher           11.00

[113 rows x 8 columns]
```

[1185]:
```
rate_stats.nlargest(10, columns=['count']).plot.bar(y='count', figsize=(12,10),␣
↪legend=None)
plt.title('Most Rated Breeds', fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Number of Tweets', fontsize=14)
plt.xticks(fontsize=12)
```

[1185]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'Golden Retriever'),
  Text(1, 0, 'Labrador Retriever'),
  Text(2, 0, 'Pembroke'),
  Text(3, 0, 'Chihuahua'),
  Text(4, 0, 'Pug'),
  Text(5, 0, 'Toy Poodle'),
  Text(6, 0, 'Chow'),
  Text(7, 0, 'Samoyed'),
  Text(8, 0, 'Pomeranian'),
  Text(9, 0, 'Malamute')])
```

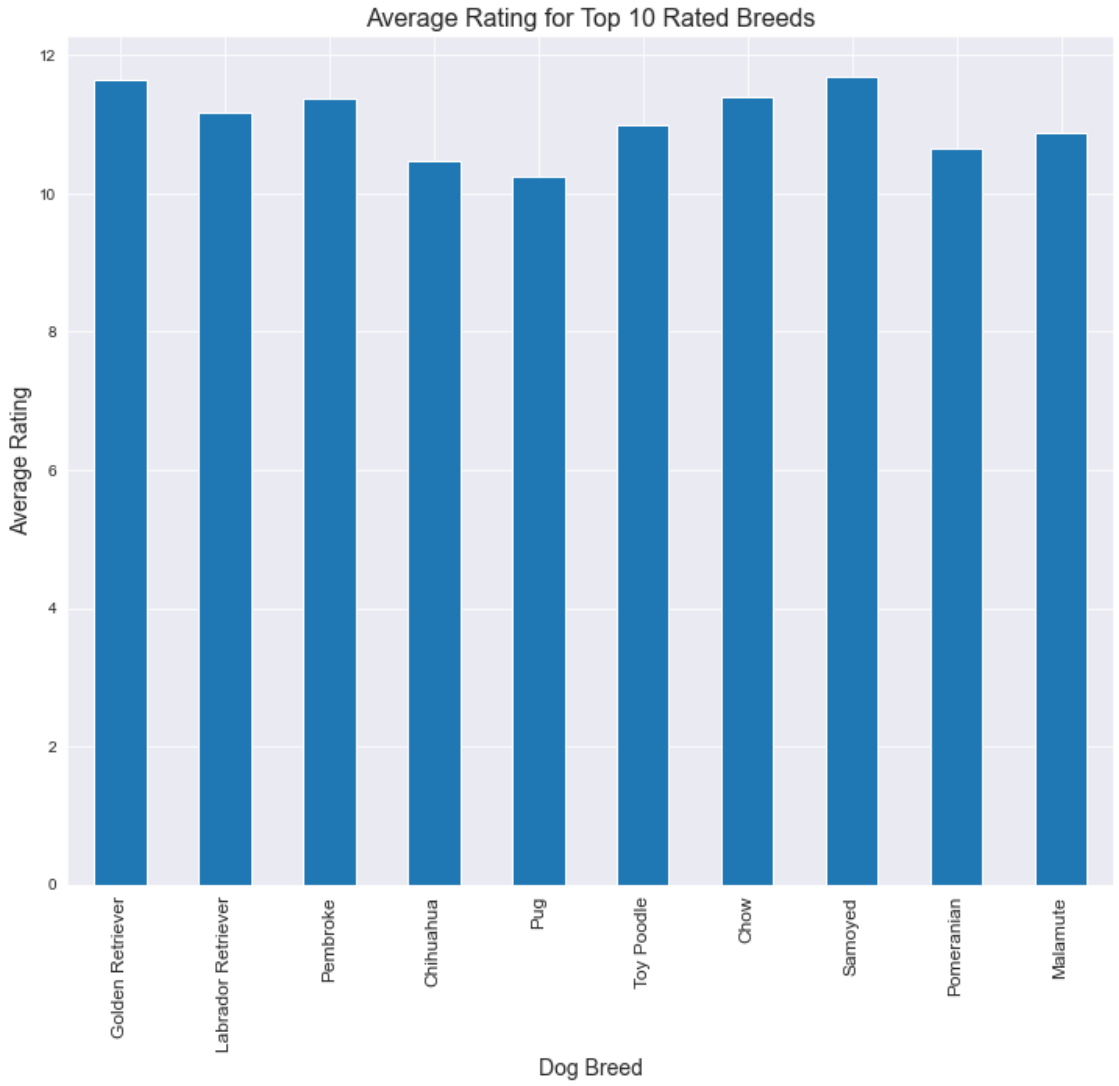


What is the average rating for top 10 rated breeds?

[1187]:
```
rate_stats.nlargest(10, columns=['count']).plot.bar(y='mean', figsize=(12,10),␣
↪legend=None)
plt.title('Average Rating for Top 10 Rated Breeds', fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Average Rating', fontsize=14)
plt.xticks(fontsize=12)
```

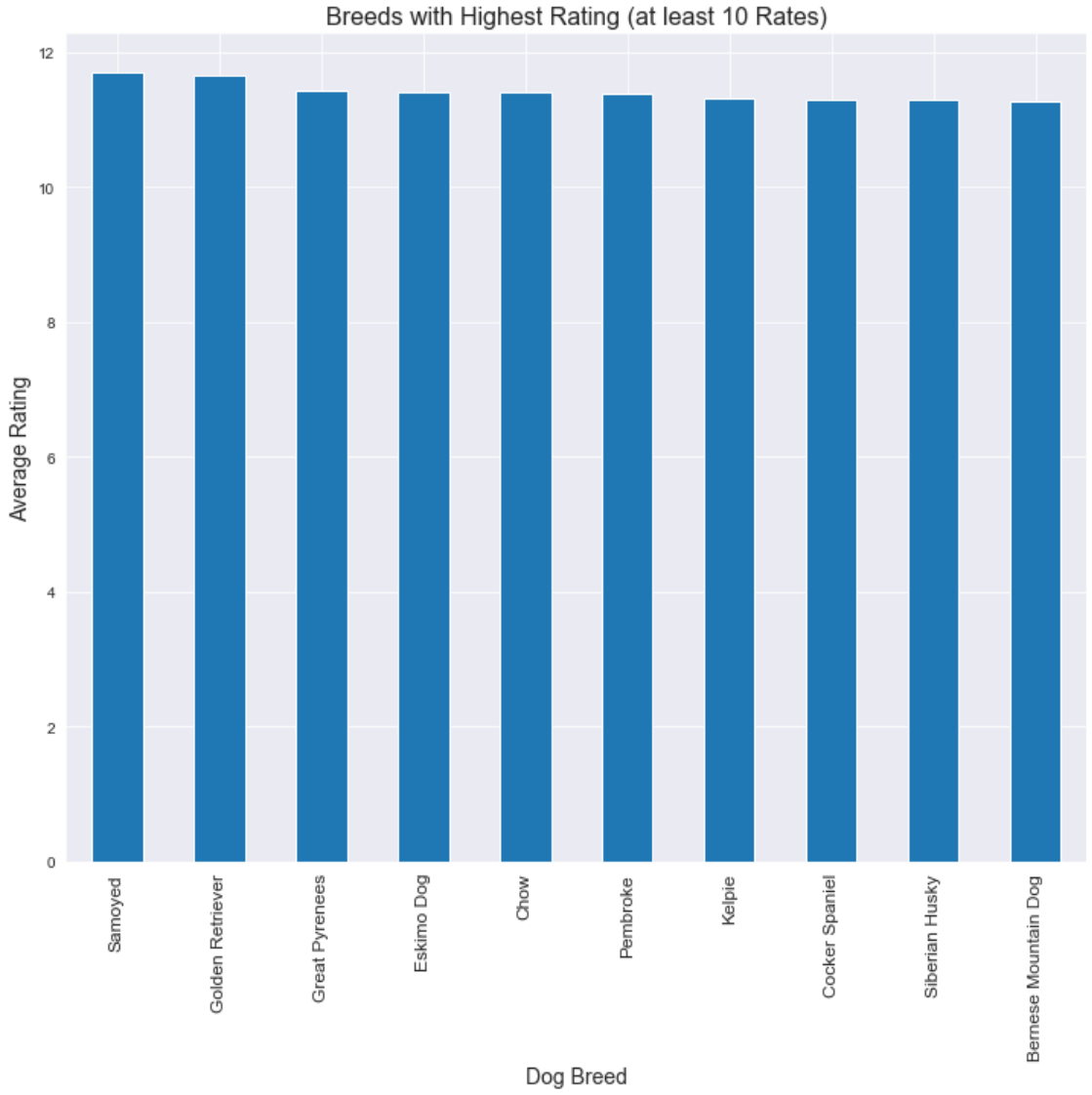
[1187]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'Golden Retriever'),
  Text(1, 0, 'Labrador Retriever'),
  Text(2, 0, 'Pembroke'),
  Text(3, 0, 'Chihuahua'),
```

```
Text(4, 0, 'Pug'),
Text(5, 0, 'Toy Poodle'),
Text(6, 0, 'Chow'),
Text(7, 0, 'Samoyed'),
Text(8, 0, 'Pomeranian'),
Text(9, 0, 'Malamute')])
```



[1191]:
```
rate_stats[rate_stats['count'] >= 10].nlargest(10, columns='mean').plot.
 ↪bar(y='mean', figsize=(12,10), legend=None)
plt.title('Breeds with Highest Rating (at least 10 Rates)', fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Average Rating', fontsize=14)
plt.xticks(fontsize=12)
```

```
[1191]: (array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
         [Text(0, 0, 'Samoyed'),
          Text(1, 0, 'Golden Retriever'),
          Text(2, 0, 'Great Pyrenees'),
          Text(3, 0, 'Eskimo Dog'),
          Text(4, 0, 'Chow'),
          Text(5, 0, 'Pembroke'),
          Text(6, 0, 'Kelpie'),
          Text(7, 0, 'Cocker Spaniel'),
          Text(8, 0, 'Siberian Husky'),
          Text(9, 0, 'Bernese Mountain Dog')])
```

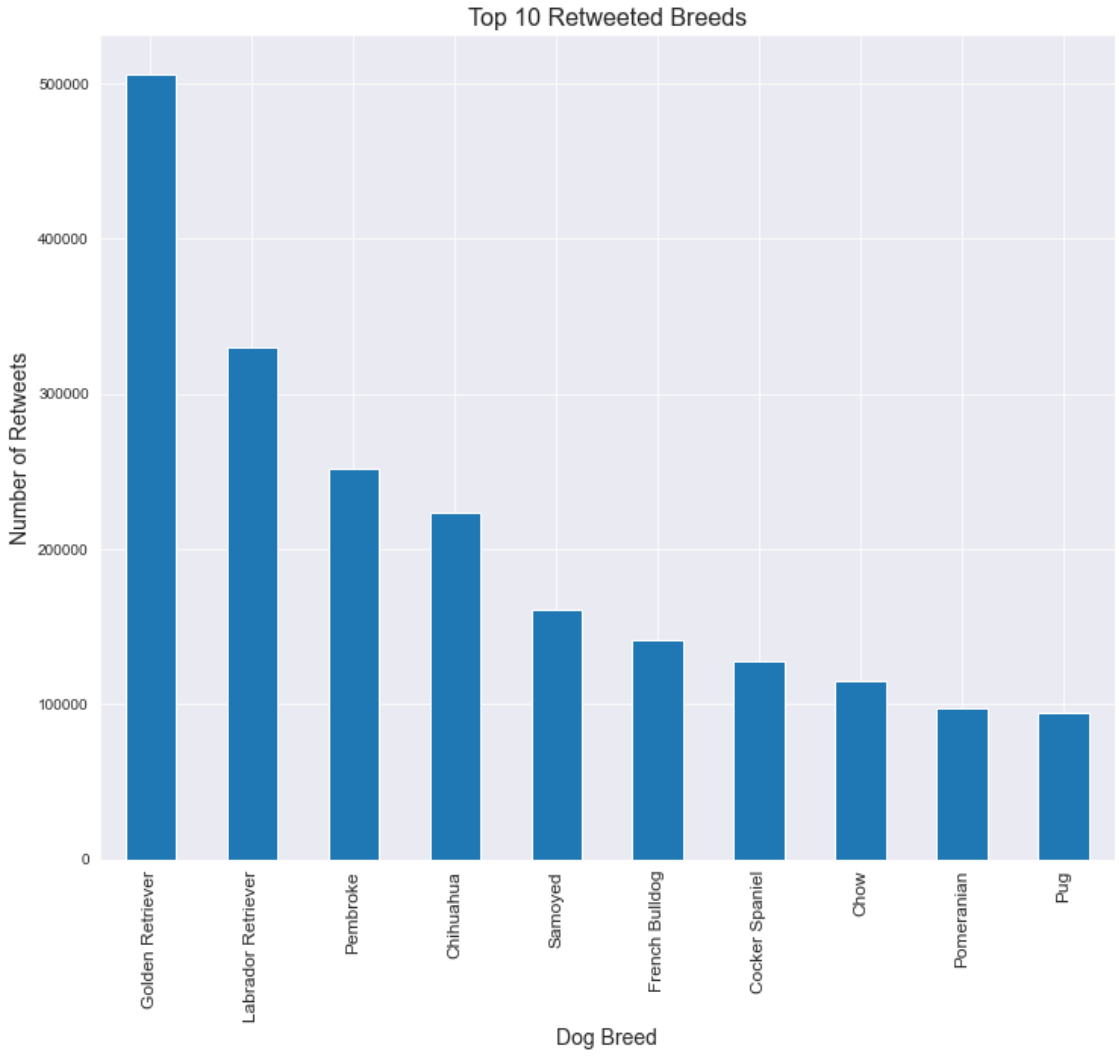


What are the most retweeted dog breeds?

[1194]:
```
retweet_sum = rating_df[rating_df.dog_breed != 'Unkown'].groupby(['dog_breed']).
↪sum()['retweet_count']
```

[1199]:
```
retweet_sum.nlargest(10).plot.bar(figsize=(12,10))
plt.title('Top 10 Retweeted Breeds', fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Number of Retweets', fontsize=14)
plt.xticks(fontsize=12)
```

[1199]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'Golden Retriever'),
  Text(1, 0, 'Labrador Retriever'),
  Text(2, 0, 'Pembroke'),
  Text(3, 0, 'Chihuahua'),
  Text(4, 0, 'Samoyed'),
  Text(5, 0, 'French Bulldog'),
  Text(6, 0, 'Cocker Spaniel'),
  Text(7, 0, 'Chow'),
  Text(8, 0, 'Pomeranian'),
  Text(9, 0, 'Pug')])
```



[1200]:
```
retweet_stats = rating_df[rating_df.dog_breed != 'Unkown'].
↪groupby(['dog_breed']).describe()['retweet_count']
```

[1202]:
```
retweet_stats
```

[1202]:

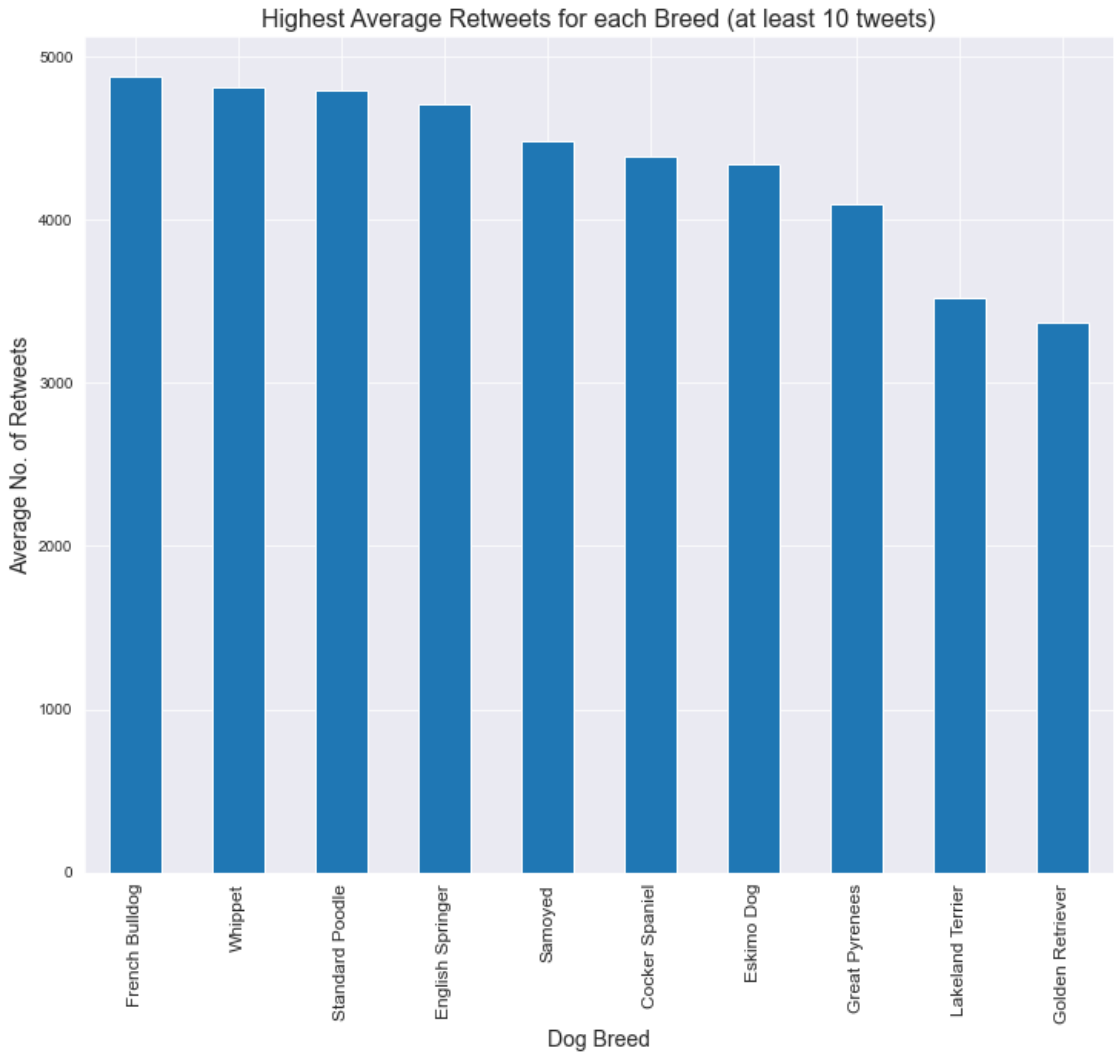
dog_breed	count	mean	std	min	\
Afghan Hound	3.0	5136.000000	3834.429293	1632.0	
Airedale	12.0	1204.416667	1145.325000	74.0	
American Staffordshire Terrier	15.0	1780.866667	1151.119013	198.0	
Appenzeller	1.0	1819.000000	NaN	1819.0	
Australian Terrier	1.0	4780.000000	NaN	4780.0	
…	…	…	..	…	
Welsh Springer Spaniel	4.0	948.000000	1007.748646	382.0	
West Highland White Terrier	15.0	1148.333333	1176.805826	50.0	

```
Whippet                          10.0   4811.000000  8953.021675  191.0
Wire-Haired Fox Terrier          2.0    2556.500000  488.610786   2211.0
Yorkshire Terrier                9.0    1239.000000  940.973034   60.0

                                     25%     50%      75%      max
dog_breed
Afghan Hound                     3088.00  4544.0  6888.00  9232.0
Airedale                         658.25   843.0   1219.75  4197.0
American Staffordshire Terrier   922.00   1444.0  3012.50  3560.0
Appenzeller                      1819.00  1819.0  1819.00  1819.0
Australian Terrier               4780.00  4780.0  4780.00  4780.0
…                                  …       …       …        …
Welsh Springer Spaniel           439.00   476.0   985.00   2458.0
West Highland White Terrier      565.00   787.0   1239.50  4260.0
Whippet                          733.00   1888.0  4154.25  29867.0
Wire-Haired Fox Terrier          2383.75  2556.5  2729.25  2902.0
Yorkshire Terrier                863.00   1029.0  1689.00  2811.0

[113 rows x 8 columns]
```

What are the average number of retweets per breed?

[1220]:
```
retweet_stats[retweet_stats['count'] >= 10].nlargest(10, columns='mean').plot.
 ↪bar(y='mean', figsize=(12,10), legend=None)
plt.title('Highest Average Retweets for each Breed (at least 10 tweets)',␣
 ↪fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Average No. of Retweets', fontsize=14)
plt.xticks(fontsize=12)
```

[1220]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'French Bulldog'),
  Text(1, 0, 'Whippet'),
  Text(2, 0, 'Standard Poodle'),
  Text(3, 0, 'English Springer'),
  Text(4, 0, 'Samoyed'),
  Text(5, 0, 'Cocker Spaniel'),
  Text(6, 0, 'Eskimo Dog'),
  Text(7, 0, 'Great Pyrenees'),
  Text(8, 0, 'Lakeland Terrier'),
  Text(9, 0, 'Golden Retriever')])
```



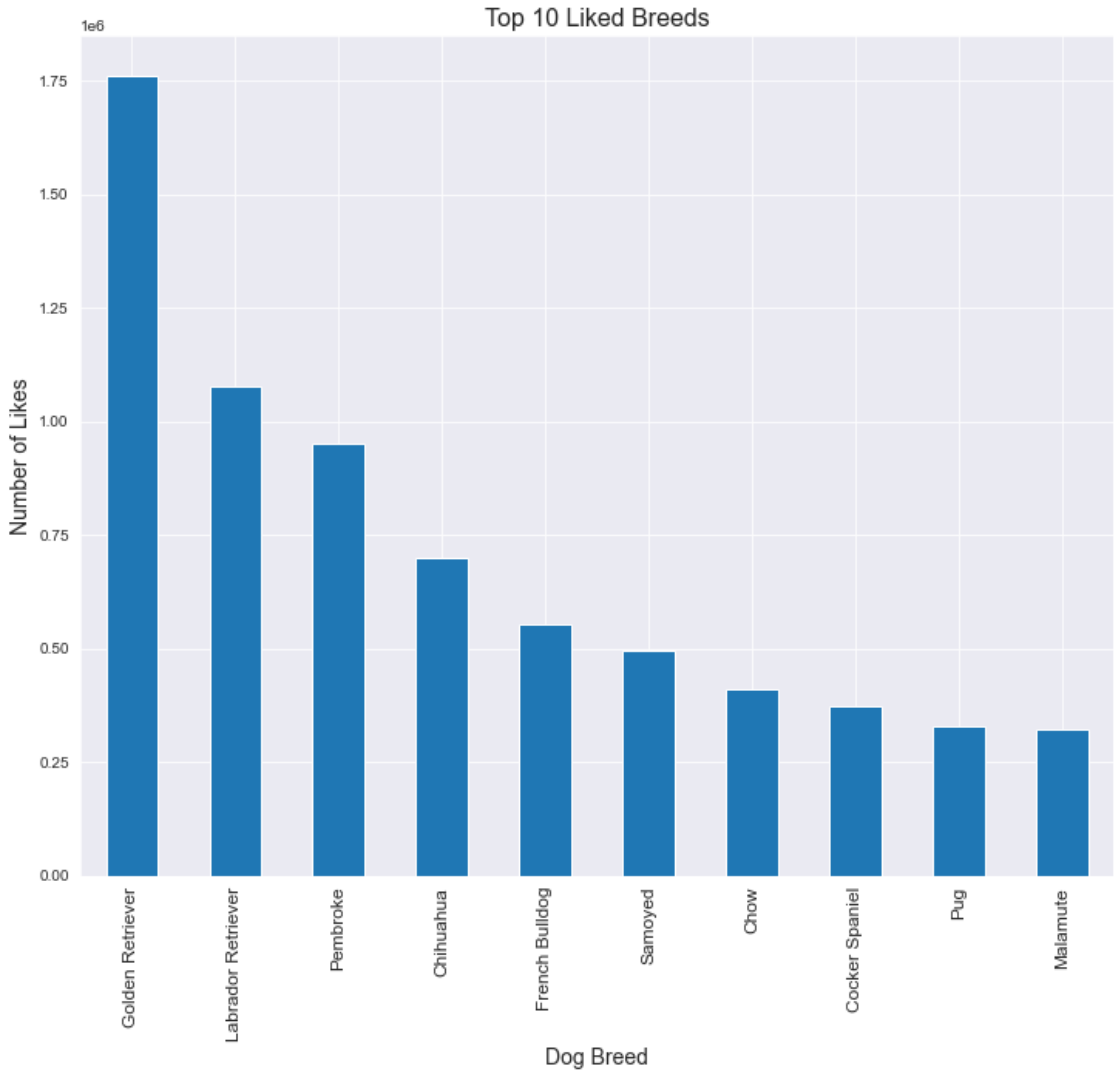
What are the most favorited breeds?

[1210]:
```
favorite_sum = rating_df[rating_df.dog_breed != 'Unkown'].
↪groupby(['dog_breed']).sum()['favorite_count']
```

[1212]:
```
favorite_sum.nlargest(10).plot.bar(figsize=(12,10))
plt.title('Top 10 Liked Breeds', fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Number of Likes', fontsize=14)
plt.xticks(fontsize=12)
```

[1212]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'Golden Retriever'),
  Text(1, 0, 'Labrador Retriever'),
```

```
Text(2, 0, 'Pembroke'),
Text(3, 0, 'Chihuahua'),
Text(4, 0, 'French Bulldog'),
Text(5, 0, 'Samoyed'),
Text(6, 0, 'Chow'),
Text(7, 0, 'Cocker Spaniel'),
Text(8, 0, 'Pug'),
Text(9, 0, 'Malamute')])
```



What are the average favorite per breed?

[1213]:
```
favorite_stats = rating_df[rating_df.dog_breed != 'Unkown'].
↪groupby(['dog_breed']).describe()['favorite_count']
```

[1214]:
```
favorite_stats
```

[1214]:

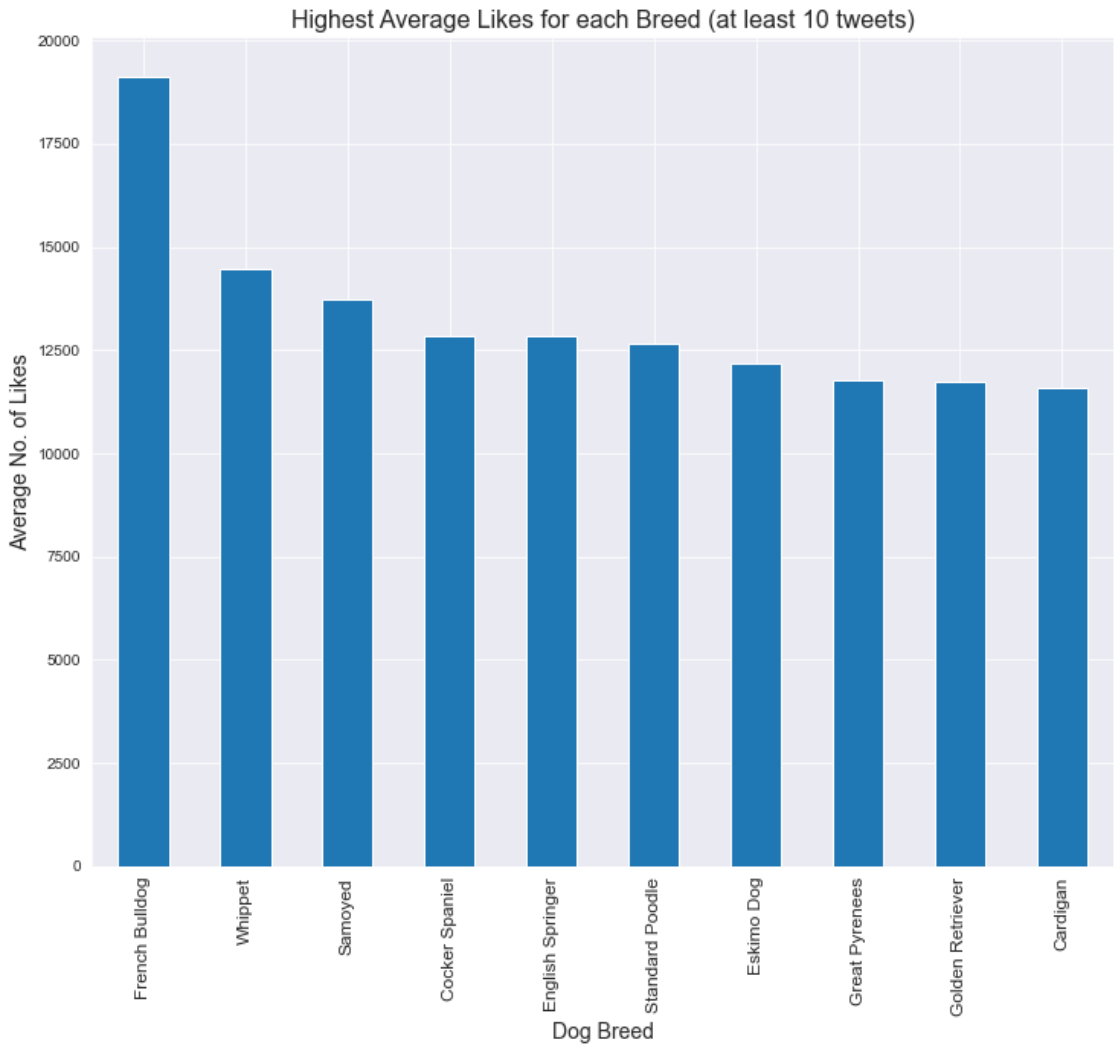
dog_breed	count	mean	std	min	25%	50%	75%	max
Afghan Hound	3.0	15599.666667	9222.098966	6353.0	11001.00	15649.0	20223.0	24797.0
Airedale	12.0	4767.416667	5703.095323	200.0	1332.75	2720.0	5076.0	20074.0
American Staffordshire Terrier	15.0	7631.933333	6735.823446	429.0	2788.50	5337.0	11011.0	22217.0
Appenzeller	1.0	10927.000000	NaN	10927.0	10927.00	10927.0	10927.0	10927.0
Australian Terrier	1.0	18165.000000	NaN	18165.0	18165.00	18165.0	18165.0	18165.0
…	…	…	..	…	…	…	…	…
Welsh Springer Spaniel	4.0	4579.250000	4354.462720	1266.0	2103.75	3059.0	5534.5	10933.0
West Highland White Terrier	15.0	5046.533333	7228.977381	220.0	1155.50	2284.0	3767.5	23740.0
Whippet	10.0	14475.500000	22160.269524	536.0	2675.00	6393.0	15688.5	73913.0
Wire-Haired Fox Terrier	2.0	7680.000000	3160.767312	5445.0	6562.50	7680.0	8797.5	9915.0
Yorkshire Terrier	9.0	4396.444444	4035.946020	194.0	2493.00	2769.0	7385.0	12760.0

[113 rows x 8 columns]

[1222]:
```
favorite_stats[favorite_stats['count'] >= 10].nlargest(10, columns='mean').plot.
 ↪bar(y='mean', figsize=(12,10), legend=None)
plt.title('Highest Average Likes for each Breed (at least 10 tweets)',␣
 ↪fontsize=16)
plt.xlabel('Dog Breed', fontsize=14)
plt.ylabel('Average No. of Likes', fontsize=14)
plt.xticks(fontsize=12)
```

[1222]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'French Bulldog'),
  Text(1, 0, 'Whippet'),
  Text(2, 0, 'Samoyed'),
  Text(3, 0, 'Cocker Spaniel'),
  Text(4, 0, 'English Springer'),
  Text(5, 0, 'Standard Poodle'),
```

```
Text(6, 0, 'Eskimo Dog'),
Text(7, 0, 'Great Pyrenees'),
Text(8, 0, 'Golden Retriever'),
Text(9, 0, 'Cardigan')])
```



[ ]: